Adherence to the Risk, Need and Fidelity Principles: Examining the Impact of Dosage in Correctional Programming

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ABSTRACT

Every single day in the United States, correctional agencies release individuals back into the community. Depending on the state, many of these individuals may be placed in halfway houses as a mechanism for transitioning the offender back into the community. There is no set model for halfway houses, and even within the same state or operated by the same provider, the programs and services, if available, will vary. Perhaps the only requirement that all halfway houses share focuses on public safety and adopting efforts to monitor and enforce community supervision conditions. Despite this common thread, the costs for treatment and programming are often limited and allocations for effective programming and interventions can be a challenge for community supervision. The current study examined the impact of dosage, use of modeling and role playing, application of core correctional practices, and targeting of criminogenic needs on a sample of 3281 Pennsylvania parolees who were directed to halfway houses following their release from prison. While this sample is unique and this group of offenders experienced high rates of recidivism, a few findings emerged that offers empirical support for dosage and criminogenic needs. In particular, adopting three to nine months of programming and targeting the strongest dynamic predictors (e.g., antisocial attitudes, antisocial peers, and antisocial personality) produced the greatest impact on recidivism. This study also offered insight into the common targets of community programming and supervision (e.g., employment, education, substance abuse) that are relevant stabilizing factors for offenders, but collectively were unable to produce the reductions in recidivism that were likely hoped for. The implications for the current research may offer more lessons learned for practitioners and policy makers about what practices to avoid rather than adopt, or more ideally, what efforts should take priority in order to improve offender outcomes.

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This has been one of the last pages I have waited to write up for this dissertation and the decision was without question, deliberate. What I can state is that the words have gone through my mind, countless times. So, now I have the chance to finally type them up. To start, I want to thank my committee and the faculty at UC who I had the privilege to learn from. Dr. Latessa, you have a brilliant life about you that is simply phenomenal. It is a treat to work across this country now, and on a regular basis get asked, "Have you heard of Dr. Latessa?" This always puts a smile on my face as I offer my standard reply, "Hasn't everyone?"

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Dr. Cullen, you may not know it, but one of the most important lessons I have learned from you is that in order to be well informed and be an expert, you have to read everything. So, while I do read any and all articles sent my way or pull everything I can to be well informed, this extended into an area of my life that was more personal than professional at times. I am not sure you ever had a chance to meet my son, Luke. If someone had told me years ago, someday I would have to be a strong and diligent advocate for my kid, and this would routinely require engaging in multiple heated confrontations, depositions with attorneys, challenges with doctors, and even debates with school psychologists regarding the selection of appropriate evaluations to learn more about Luke, I would have run the other way. I was ill prepared for this, but I have found that by reading everything I can get my hands on has often made me one of the most informed individuals and a stronger advocate for Luke. I have you to thank for this.

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CHAPTER ONE

RECOGNIZING THE IMPACT OF THE PRINCIPLES OF EFFECTIVE INTERVENTION IN CORRECTIONAL PROGRAMMING

Introduction

The Principles of Effective Intervention are a concept that is becoming more recognized within corrections especially with the development, administration, and research related to actuarial risk assessments and program evaluation. Specifically, the four primary principles are risk, need, responsivity and fidelity. First, within correctional programming, risk identifies who should be targeted for resources and who should be given the greater dose of treatment based on their probability to recidivate. Further, the risk principle suggests that high and low risk offenders should not be mixed into the same programming or interventions. Second, criminogenic needs are the dynamic risk factors to be addressed through appropriate treatment and intervention. Third, factors influence how correctional programs and practitioners should address offenders through cognitive behavioral interventions and by identifying and addressing barriers to offender success. Fourth, the fidelity principle relates to evaluating the quality of programming based on content and capacity, or the risk, need and responsivity principles.

Within the framework of this dissertation will be an examination of the risk and need principles and the impact these principles have on the effectiveness of correctional programming and offender outcomes. While there has been an abundance of research related to identifying and targeting by risk, the questions related to duration and intensity of treatment and services by risk are still relatively unexplored. Specifically, the objective of this research will evaluate the impact of dosage and the targeting of criminogenic needs within correctional programming as it

relates to risk. Data for this study were obtained from the program evaluations conducted on 54 community correctional centers and facilities in the Pennsylvania Department of Corrections. For the Pennsylvania Department of Corrections (PADOC), offender risk is assessed with the Level of Service Inventory Revised, LSI-R. This research will examine recidivism rates for the treatment group based on the percentage of criminogenic needs targeted and the dosage of structured groups. These analyses will be examined by risk level as determined by the normed cutoffs for the PADOC. The outcome measures include: technical violations, arrests and re-incarceration. Adherence to the risk, need, and fidelity principles will be based on program level data collection efforts from the Evidence Based Correctional Program Checklist (CPC).

The Impact of Incarceration and Correctional Effectiveness

Over the past two decades, the United States has been seeing quite a growth in the correctional system and the research on correctional effectiveness. Deterrence-based models, public opinion and legislation have certainly been identified as factors influencing the correctional population. However, there has been a shift in the hegemony of correctional ideologies. Specifically, the movement toward rehabilitation efforts and empiricism has generated a focus for developing a more efficient and effective system that still maintains the priority of public safety. Yet, the growth in the U.S. correctional population coupled with the recent national economic crisis may start to diminish these efforts. Correctional programming is quickly becoming one of the first items to be reduced or eliminated during this fiscal crisis in an effort to maintain the commitment to public safety. The discussion that follows will provide the major issues surrounding the national trends for correctional and supervision populations as well as the budgetary shortcomings.

Since 2009, correctional populations have started to slowly decline. The total number of individuals under some form of correctional supervision (i.e., incarcerated in jail or prison, under probation or parole supervision) at the end of 2013 was estimated to be nearly 6.9 million offenders (Glaze and Kaeble, 2014). Of these 6.9 million offenders, 1.57 million were incarcerated within state and federal facilities (Glaze and Kaeble, 2014) and overall, 1 in 110 adults were incarcerated in prisons or jails, which is a decrease from 1 in 102 observed in 2009 and 1 in 100 from 2006 through 2008 (Glaze and Kaeble, 2014; Glaze and Herberman, 2013). Nearly 57% (N= 3.91 million) of those on correctional supervision at yearend 2013 were on probation and almost 12% were on parole supervision, both of which represent a steady decline in community-based supervision since 2007, but is fairly consistent with the number of community-based supervised adults found at yearend 2011 (Glaze and Kaeble, 2014; Glaze and Herberman, 2013).

While the incarceration rates have either slowed slightly or declined for some states in others the numbers are still climbing. Specific to the current research, the Pennsylvania Department of Corrections observed nearly a 42% increase in admissions between 2001 through 2011. Over this timeframe, new court commitments increased over 46%, and parole violator admissions increased almost 39% (Lategan, O'Neill, and Santore, n.d.) The issue of increasing admissions for parole violations is not uncommon. Langan and Levin (2002) suggest that slightly over 50% of the individuals released from prison are back within a three year period, many of which are for violations of probation or parole, suggesting that many of these prisons and jails are incarcerating the same offenders repeatedly. More recently, the Bureau of Justice Statistics examined arrest rates on a sample of 404,368 offenders who were released from prisons in 2005 from 30 states. Of these, almost 68% were arrested within 3 years and nearly

77% were arrested within 5 years of release (Durose, Snyder, and Cooper, 2014). While this report did not specify the percent that were returned to prison, the implication is that recidivism rates at three years out suggest that over 50% of offenders will likely recidivate within three years.

Overall costs of imprisonment continue to be quite staggering and while there have been substantial increases in the cost to incarcerate offenders, there have also been states that have seen a decline in corrections spending. In 1987, all 50 states spent a total of $10.6 billion dollars on corrections. Just 20 years later, this figure has increased to $44 billion from state general funds and with federal dollars included the money spent on corrections was $49 billion (Pew Center, 2008). Focusing on Pennsylvania, the cost of incarcerating an inmate was approximately $80.83 a day, or $29,500 a year in 2007. By 2010, the cost per day for incarcerating an inmate in Pennsylvania increased to $42,339 a year (Henrichson and Delaney, 2012). While reductions in correctional populations and declines in correctional spending have been noted recently, these findings are not consistent across states. Coupled with over 50% recidivism rates, these factors of correctional population size and reductions in correctional spending may continue to limit the ability and capacity for correctional systems to operate effectively.

This is especially concerning if the system makes decisions arbitrarily rather than empirically. With actuarial, validated and normed risk assessment instruments, correctional programs have the ability to identify their low and high risk populations, to separate these groups and to responsibly direct limited resources to the higher risk offenders. Given the economic crisis and size of the offender population under some form of supervision, there is a movement toward identifying correctional strategies and program characteristics that are most effective in reducing recidivism. Correctional systems are being asked to do more with less. The concept of

performance-based contracts has grown in popularity, but the demand for this type of review requires an empirical indicator that offender programs are adhering to the principles of effective intervention and demonstrating a treatment effect.

Programs that adhere to the principles of effective intervention and have demonstrated a treatment effect contain certain programmatic characteristics (Andrews, 1995; Gendreau, 1996). Cullen and Gendreau (2000) summarize the four principles of effective programming as:

(1) Programs should target the known predictors of crime in order to produce behavioral change and reductions in recidivism. Andrews (1995) identified that the "big four" dynamic risk factors include: antisocial attitudes, values and beliefs, procriminal associations and a lack of associations with prosocial individuals, antisocial personality (impulsivity, risk taking, and low self control) and prior antisocial behavior (criminal history).

(2) Treatment services and delivery should follow a behavioral approach. Cognitive behavioral interventions that apply social learning strategies such as, modeling, graduated rehearsal, reinforcement and extinction.

(3) Treatment interventions should target higher risk offenders who are identified through a validated actuarial risk and needs assessment tool. The intensity and dosage of services should range between three to nine months of treatment with at least 200 or more hours of direct cognitive interventions.

(4) The treatment effect is likely to increase when additional programmatic elements are maintained. Some of these program content and capacity items would be: treatment services are situated within community settings when possible, responsivity issues are identified and barriers to treatment are addressed, staff are well trained and supportive of

the treatment model, relapse prevention and aftercare services are provided within the framework of the program and a structured plan for quality assurance to examine program effectiveness is followed.

Recognizing that these program characteristics are linked to the most effective programs, a brief discussion on the importance of measuring program integrity follows.

Measuring Program Integrity

The examination of program integrity is not to be confused with conducting an outcome evaluation, rather the identification of effective program characteristics and the actual measurement of program integrity are essential for successful replication of program models. Quay (1977) argued that the focus of research on correctional interventions has often been directed toward the rigor of the study's research design and examining recidivism rates than an evaluation of program integrity. Quay (1977) suggested that there are four components for examining program integrity. First, the treatment model should be concise and clearly defined, grounded in empirical research and applicable in a variety of settings. Second, the treatment model and services delivered within a program, including the length and intensity of treatment, should be examined. Third, personnel characteristics are also considered an important characteristic of program integrity. Examples of relevant program characteristics to evaluate program fidelity are education levels and professional experience, training, and direct program supervision. Fourth, properly identifying the targeted population for treatment and matching the offenders to the appropriate personnel and programming avoids the 'one size fits all' approach to correctional interventions and demonstrates that the program is responsive to a variety of offender characteristics (Quay, 1977).

Since Quay's (1977) study, there has been ample empirical evidence to support that rehabilitation is an effective correctional ideology for reducing offender behavior. However, few studies have focused on empirically identifying the elements of rehabilitative programs that are essential for increasing program efficacy. To identify which treatment program characteristics were successful in reducing recidivism, Antonowicz and Ross (1994) evaluated the programmatic factors hypothesized by other researchers as being associated with effectiveness. Similar to the factors suggested by Quay (1977), there were six program characteristics found to be associated with program success, including: (1) a well defined conceptual model, such as a cognitive behavioral model; (2) a model with multiple aspects to address a variety of offender characteristics; (3) targets criminogenic needs; (4) adheres to the responsivity principle; (5) incorporates social skills training; and (6) utilizes modeling and role playing to address antisocial cognitions and behaviors (Antonowicz and Ross, 1994).

Non-programmatic factors, such as, staff characteristics, staff and client interactions, offender differences and setting arguably also have an impact in the effectiveness of the program. Palmer (1995) posited that the evaluation of these non-programmatic factors should be expanded. Specifically, staff characteristics should not be limited to personality characteristics, but should incorporate age, gender, ethnicity, job training, educational background, and previous job experience. Staff and client interactions are to go beyond matching and should include the process for developing professional rapport, engaging the client and targeting criminogenic needs. Palmer (1995) contends that the client's characteristics should focus not only on personality and psychological measures, but should examine the impact of the client's background and social and demographic characteristics. Setting is also considered an important non-programmatic factor; however, rather than just examining if the program is public or private,

mandatory or voluntary, and if the type is based in the institution or the community, it is important to also evaluate the management communication and decision-making system and the social and cultural context for staff (Palmer, 1995).

Suggesting there is a 'global approach' to program evaluation, Palmer (1995) describes this process as examining if there are combinations of programmatic and non-programmatic factors, that are more likely to result in reductions in recidivism. This proposed study draws on this limited body of research by empirically addressing the research questions below.

Research Questions

The issue of program effectiveness has taken on a major role in responding to the size of correctional populations, the fiscal economic crisis and sharp reduction in funding within corrections, and the consistent recidivism rates. Many correctional departments across the United States are making the difficult choice of setting priorities for risk containment and risk reduction. Often, risk containment practices are salvaged before efforts in risk reduction, although states have needed to participate in early release efforts of their prisoners. The primary challenge that follows is that correctional systems may be releasing individuals without the necessary treatment programs that would potentially decrease their likelihood for returning to their facilities. As such, community supervision is expected to safely manage parolees and when fiscally possible, provide treatment for these individuals. Given the recognized limitations for properly allocating funding, correctional systems need to identify programs that are providing treatment and services that adhere to the principles of effective intervention and reduce recidivism. The following research questions will be addressed in this dissertation:

(1) Based on the three risk levels (low, moderate and high), what dosage of treatment is appropriate for these groups to reduce their risk of recidivism?

(2) Based on the three risk levels, what percentage of group time should focus on modeling and role playing, to reduce the risk of recidivism?

(3) Based on the three risk levels, what percentage of group targets (i.e., criminogenic needs) are associated with reductions in recidivism?

(4) Based on the three risk levels, what combination of group targets is associated with a reduction in recidivism?

Summary

The following chapter will provide a detailed review of the research examining the principles of effective intervention and the relevance of risk, need, responsivity and fidelity. Chapter three will discuss the methodology, samples, data collection process and the statistical analyses involved in this study. Chapter four will present the findings of these analyses. Chapter five will summarize these results, present the limitations of the current study, and discuss the policy implications and future recommendations for evaluating correctional programs. Finally, chapter five will present suggestions for identifying successful programs related to group structure and dosage by risk level that can serve as models for correctional systems and programs.

CHAPTER 2

REVIEW OF THE LITERATURE

From Nothing Works to What Works

During the 1970's, rehabilitation came under attack following a review of 231 studies conducted by Martinson (1974). Martinson (1974) suggested that "with few and isolated exceptions, rehabilitation has no appreciable effect on recidivism" (p.23). The implication was that nothing works to rehabilitate offenders. The research was met with great support given the socio-political context of this time period. Specifically, during the 1960's there were mass changes in society and criminal justice. In particular, there were demonstrations, civil unrest, disobedience, as well as publicized prison riots. The current United States sentencing model followed indeterminate sentencing guidelines and the rehabilitation of offenders was becoming a less popular correctional philosophy. Both liberals and conservatives shared in this perspective and supported Martinson's findings, but for different reasons. For liberals, indeterminate sentences were seen as unjust and unfair for offenders and it appeared as though offenders were serving lengthier sentences in order to demonstrate that they were reformed. For conservatives, rehabilitation was seen as coddling the offender. As such, both sides were choosing to shift to a determinate sentencing model, where rehabilitation was no longer a guiding philosophy (Cullen and Gilbert, 1982).

Changes in sentencing guidelines began along with a host of punitive deterrence based sanctions that were aimed at punishing the offender. While Martinson (1979) recanted his conclusions just five years later, this didn't garner the same attention as the 1974 study. However, several researchers recognized that one well timed study had managed to produce very

swift and dramatic changes without any review and as a result, a strong response from the field followed (Palmer, 1975; Gendreau and Ross, 1979, 1987; Cullen and Gendreau, 1989).

In an effort to review Martinson's study, Palmer (1975) conducted a ballot box review for 82 of included studies in Martinson's work. The remaining 149 studies from Martinson's 1974 work were not reviewed by Palmer as these did not examine the impact of treatment on recidivism. Palmer noted that 48 percent of the rehabilitation programs had actually reduced recidivism but were not reported as being effective in Martinson's research. Further, Palmer (1975) suggested that future research in the area should identify which programs work, with what offenders, and under what conditions (p.150). This call for further research in examining the effectiveness of treatment with offenders provided a foundation for the principles of effective intervention (Gendreau, 1996). Following Palmer's study, two separate studies were produced by Gendreau and Ross. In 1979, Gendreau and Ross conducted a comprehensive narrative review of 95 studies from 1973-1978. This study suggested that nearly 86 percent of the programs noted that rehabilitation is effective in reducing recidivism. In 1987, they completed another narrative review of 130 studies and noted that behaviorally-oriented programs appeared to have an impact on reducing recidivism. Both of these reviews concluded that rehabilitation efforts have produced reductions in recidivism. Gendreau and Ross (1987) noted that the most effective programs appeared to focus on criminogenic needs, or the dynamic risk factors empirically associated with recidivism. In addition, they found that program effectiveness varied based on offender characteristics and whether or not these characteristics impacted the delivery of the program model and services. For example, Gendreau and Ross (1987) suggested that high risk offenders benefitted the most from treatment which follows a behavioral approach and individuals with intellectual disabilities would be best supported in a structured learning

environment. However, these studies also indicated that a source of the problem for correctional interventions being considered effective was related to lack of therapeutic integrity (Gendreau and Ross, 1979, 1987).

While these studies demonstrate that rehabilitation is not ineffective, there are limitations with these methodologies. In particular, the rigor of these methods, narrative reviews and the ballot box method, have some inherent subjective bias due to their qualitative assessment process. Specifically, narrative reviews provide an overall qualitative summary of the existing literature and do not typically distinguish studies from one another in terms of their experimental rigor, may omit key data, and are not necessarily replicable. The ballot box method involves comparing the number of significant to insignificant studies and there is the potential with insignificant studies to improperly assume that the intervention had no effect. With the advent of meta-analysis, research would now be able to quantitatively synthesize all of the existing and eligible studies and would consistently examine relevant variables across all studies, in order to provide an overall average effect size for treatment programs and correctional interventions (Smith and Glass, 1977). In addition, since meta-analysis utilizes a coding guide for eligible studies, this technique would be replicable.

Meta-Analysis

The term meta-analysis was coined by Gene Glass in 1976 and this statistical technique for reviewing and synthesizing the literature involves two primary steps. First, descriptive characteristics of each eligible study are coded using categorical or continuous coding schemes. Criteria for identifying eligible studies, such as, publication timeframe, location, examining particular samples or outcome measures, and research design, are generally determined in

advance of the search for articles and reports. Second, the outcomes of each study are then calculated into a common metric called an effect size (Hunt, 1997; Izzo and Ross, 1990; Lipsey and Wilson, 2001). Effect sizes or summary statistics are calculated for each individual study and then an overall average effect size is calculated across eligible studies. While certainly more sophisticated than conducting a narrative review or the ballot box method, there are some clear limitations that exist with meta-analytic techniques (Smith and Glass, 1977; Lipsey and Wilson, 2001).

Critics of meta-analysis often conclude that meta-analysis is a flawed process; however, there are techniques or steps that can be taken to minimize these limitations. Common criticisms of meta-analysis include: (1) varying research designs from identified studies, (2) publication bias, and (3) the 'apples and oranges' problem.

This first concern with meta-analysis is that studies of varying methodological rigor may be incorporated into the meta-analysis and may have an impact on the final effect size. For example, randomized experimental designs would be considered more rigorous than a case study. One technique to resolve this issue is to examine if the methodological rigor of the study is significantly related to the individual effect size for that study. Rosenthal (1991) suggests that weighting of studies by their methodological rigor is one alternative to mitigate this limitation of varying research designs which would then improve the generalizability of the meta-analysis by potentially including more studies. Lipsey and Wilson (2001) note that researchers can also set the methodological designs as criteria for eligible studies; however, this can impact the representativeness of the meta-analysis if too few studies meet this criteria or if the criteria are lenient, then the effect size may be not be reliable.

The second concern with meta-analysis is related to publication or selection bias, also known as the 'file drawer' problem. Certainly, published studies are the easiest to identify. Published studies often contain significant rather than insignificant or null findings. As such, with selecting only published studies, there is the potential for bias and skewed results within a meta-analysis (Rosenthal, 1991). There may still be studies that exist that either were rejected for publication, were conducted for an internal agency evaluation and no publication was sought, or the findings were not significant so the study was not published. Ultimately, these studies require additional effort on the part of the researchers to identify and obtain, but nonetheless when this search for unpublished work is ignored it is met with a critical response. Some researchers may consider an additional calculation, known as the 'fail-safe file drawer' analysis to address this issue, which is simply based off of probabilities. This value reports the number of studies that would have to be identified that found the opposite effect to change the overall effect size (Rosenthal, 1991). This method, however, has been critiqued, and other alternatives, such as conducting a funnel plot analysis or developing research repositories so that unpublished research is accessible have been suggested (Scargle, 2000).

The final concern is often acknowledged to be the 'apples and oranges' problem. Given that across studies examining a similar correctional intervention there are differences in variables collected and how these variables are operationalized and measured, or the samples examined in the identified studies vary, there is a challenge to establish a common metric. However, meta-analysis allows for identifying what is unique across these studies and calculating effect sizes for these individual study characteristics (Lipsey and Wilson 2001). For example, meta-analyses examining treatment effectiveness of cognitive-behavioral program models do not necessarily have to result in one average effect size. Rather, effect sizes could be calculated and then

compared across studies based on the risk levels of the offenders in the individual study's samples. By identifying the differences across studies and creating similar categories to compare effect sizes, meta-analysis can then be used to unmask these distinctions and further increase the knowledge base regarding what works with correctional interventions. Ultimately, the coding scheme that is developed for a meta-analysis is essential to dealing with many of these concerns. An inter-rater agreement process should be established protocol to compare the coding of studies across researchers and to offer some reliability that each study is coded consistently.

Given these limitations and the possible alternatives to address them, meta-analysis remains the superior statistical technique for summarizing a body of literature. Further, it is an improvement upon qualitative reviews that often suffer from potential bias, challenges with replication, extracting unique differences across studies and provides results that are readily interpretable for practitioners (Gendreau, French and Goinet, 2004). To offer some context behind the meta-analyses that will be summarized within this chapter, this next section presents a brief overview of the various correctional ideologies that have been and are still in use, along with the meta-analytic evidence in support of one correctional ideology, rehabilitation.

Correctional Ideologies and Meta-Analytic Evidence Regarding the Effectiveness of Rehabilitation

Certain strategies, or correctional ideologies, are still evident in the field today despite research indicating that there has been little empirical evidence related to reductions in recidivism for the more punitive methods. The effectiveness of corrections is commonly measured by reductions in recidivism rates. The chosen methods and philosophies guiding the practices to achieve these reductions have varied and have not always successfully resulted in

empirically demonstrating decreases in recidivism. There are five main strategies that have been employed by corrections: retribution or just deserts, deterrence, incapacitation, restorative justice and rehabilitation. Retribution actually does not focus primarily on crime reduction, rather this philosophy argues that offenders are punished simply to achieve justice. Deterrence approaches follow a strategy of increasing the punishment as a method for decreasing criminal behavior. There are two forms of deterrence, general and specific. Specific deterrence is directed to the individual and suggests that if the punishment is severe enough for the offender that new crimes will not be committed. General deterrence, focuses more on the threat of punishment. If offenders recognize the punishment from criminal behavior, then they will be less likely to engage in crime. Common deterrence strategies within corrections include: intensive supervision probation, longer prison sentences, boot camps and electronic monitoring. While intensive supervision is a less expensive intermediate punishment compared to prison, this particular strategy often has produced increases in technical violations, which may eventually produce increases in prison populations (Cullen, Wright and Applegate, 1996; Fulton, Latessa and Stichman, 1997; Petersilia, 1998; Petersilia and Turner, 1993). As part of a large-scale and rigorous experimental study, Petersilia and Turner (1993) examined the effectiveness of intensive supervision probation (ISP). Their study was quite generalizable as there were 14 program sites spread across 9 states. The findings clearly demonstrated that offenders randomly placed on ISP were not as successful as those randomly assigned to standard, but less intensive, probation. The only exception to this was for offenders that were placed on ISP and there was a rehabilitative element with their supervision, which has been supported and recommended in other studies on the effectiveness of ISPs (Petersilia, 1998; Fulton et al., 1997; Cullen et al., 1996; Gendreau et al., 1996; Gendreau et al., 1994; Paternoster, 1987). Studies conducted on the

efficacy of boot camps suggests that this deterrence-based approach is no better or slightly worse than offenders in comparison groups, including prison placement (Cullen et al., 1996). Overall, deterrence-based interventions do not target an offender's criminogenic needs and fail to address the concept of general responsivity. As such, these approaches often fail to reduce recidivism (Cullen, 2002; MacKenzie 2000).

Incapacitation suggests that by incarcerating an individual or group of individuals, that crime will be reduced. Whether collective or selective incapacitation is implemented, it is recognized that there is some crime reduction with incapacitation, but the question that often follows relates to cost and what strategies are the most successful alternatives (Currie, 1998). In a review of the macro-level studies on imprisonment, Spelman (2000) noted that it would take doubling the current incarceration levels to realize a 16% to 31% reduction in crime. Finally, Clear (1994) argued that the movement toward incapacitation was nothing more than a 20 to 30 year experiment that resulted in nothing but harm.

A fourth and relatively new correctional ideology is restorative justice. Somewhat different from the other philosophies is that restorative justice seeks to reverse the harm done to the victim and the community. Following this, the offender is to be re-integrated back into society. However, restorative justice approaches, such as sentencing circles and victim impact panels, do not target the known predictors of recidivism, do not follow the principles of effective intervention and may not provide the appropriate dosage of treatment and services for higher risk offenders.

The final correctional ideology, rehabilitation, is a planned, structured and research-driven model that targets an offender's criminogenic needs, adheres to the principles of effective intervention and is designed to reduce recidivism. Meta-analyses examining various rehabilitative interventions suggest an overall effect size of .10; however it is recognized that

there is heterogeneity in the effect sizes when examining the different interventions. In particular, cognitive behavioral programming has seen effect sizes of .25 or higher (Cullen and Gendreau, 2000; Lipsey, 1999; Andrew et al., 1990; Dowden and Andrews 1999a, 1999b).

Much of the empirical evidence regarding rehabilitation strategies demonstrates its effectiveness within juvenile, adult, and specific offender populations (Andrews, Zinger, Hoge, Bonta, Gendreau and Cullen, 1990; Aos, Miller, and Drake, 2006; Dowden and Andrews, 1999; French and Gendreau, 2006; Gendreau, Goggin, Cullen, and Andrews, 2000; Hanson and Bussiere, 1998; Izzo and Ross, 1990; Landenberger and Lipsey, 2000; Lipsey, 1992; Lipsey and Wilson, 1998; MacKenzie, 2000; Pearson, Lipton, Cleland, and Lee, 2002; Wilson, Bouffard and MacKenzie, 2005). However, as previously demonstrated in the critique of narrative reviews, meta-analysis can often result in the questioning or replication of techniques (Losel, 1995; Lipsey, 1992).

Multiple meta-analyses on juvenile populations have yielded similar results indicating that rehabilitative efforts are successful in reducing delinquency (Garrett, 1985; Gottschalk, Davidson, Mayer, and Gensheimer, 1987; Izzo and Ross, 1990). Garrett's (1985) meta-analysis examined 43 studies published between 1960 through 1983 that evaluated residential treatment effects on juvenile recidivism. She found that programs which adopted a cognitive behavioral or contingency management model reduced recidivism. Garrett (1985) noted that the methodological designs across studies varied and when examining only the most rigorous designs, a slight increase in recidivism was found. Gottschalk et al., (1987) conducted a meta-analysis of behavioral programs in which the study eligibility criteria required that the included studies involve a minimum of a quasi-experimental design and fully describe the behavioral modification strategies implemented in the evaluated program. Only fourteen studies met these

criteria and were subsequently coded and analyzed. While there did appear to be a reduction in recidivism, this could not be verified due to the confidence interval including a zero (Gottschalk et al., 1987; Pearson, Lipton, Cleland, and Yee, 2002). Izzo and Ross (1990) conducted a meta-analysis examining the effectiveness of correctional treatment programs for juveniles. Included studies came from peer reviewed journal exclusively. Their results indicated that that programs conducted in the community, as opposed to institutions, and that incorporated a cognitive behavioral approach that included problem solving, role playing, and skills training were the most successful at reducing recidivism. Specifically, their findings indicated that these program were twice as effective than those without the cognitive component (Izzo and Ross, 1990).

Using meta-analytic techniques, Whitehead and Lab (1989) examined the results of 50 juvenile programs from published literature from 1975 through 1984. They selected a cutoff of a .20 effect size which had to be reached or surpassed in order to demonstrate that treatment was effective in reducing future delinquency. The average effect size did not reach .20, so as a result, Whitehead and Lab (1989) concluded that rehabilitation was ineffective for delinquent youth and recommended diversion for juveniles rather than intervention. Losel (1995) questioned this arbitrary cutoff set by Whitehead and Lab (1989) and indicated that the medical field uses a cutoff of .10 to demonstrate a positive treatment effect.

Additionally, Lipsey (1992) re-examined the results and noted that an effect size of .12 was generated from the Whitehead and Lab (1989) meta-analysis which Lipsey (1992) and Losel (1995) both concluded that this was meaningful. Further, Lipsey's 1992 meta-analysis of 200 studies examining juvenile delinquents found an average effect size of .10, but after correcting for fallibility measures within the original studies Lipsey reported that the average effect size overall was .20. Similarly, Losel's (1995) review of 13 meta-analyses indicated that when

measurement error is not corrected that it may result in underestimating the true effect size. Similar to Garrett (1985), Losel (1995) noted that studies which implemented a more rigorous research design often resulted in a lower effect size in comparison to those with weaker designs. Cullen and Gendreau (2002) and Cullen (2002) suggested that the consistent and overall positive effect size is not an artifact of the data; rather, meta-analysis has provided the opportunity to further investigate what is unique about interventions demonstrating a positive effect. A summary of these meta-analyses follows.

Lipsey (1992) examined published and unpublished studies involving incarcerated and non-incarcerated youth and calculated 443 effect sizes. He found that treatment programs following a rehabilitative model were effective in reducing recidivism. Overall, the effect size was rather small, just .12, but meaningful. Later, Lipsey (1998) and Lipsey and Wilson (1999) using these same data noted that there were distinct differences between the programs and their modalities, so the individual effect sizes were separately identified by program type. Effective programs achieved much larger effect sizes, almost as high as .40. Programs that followed a deterrence approach or did not implement a cognitive behavioral model (e.g., wilderness programs, vocational programs) were not as effective or produced weak and sometimes harmful effects.

Regarding programming for specific offending populations, Dowden and Andrews (1999) conducted a meta-analysis on female offenders and noted that adherence to rehabilitative strategies resulted in reductions in recidivism for women. Hanson and Bussiere (1998) found that rehabilitative efforts reduced recidivism in sex offender populations. Likewise, Aos, Miller, and Drake (2006) conducted a meta-analysis on 291 evaluation studies focusing on various adult offender populations within community and institutional settings. They found that cognitive

behavioral programming reduced recidivism between eight to 31 percent, with the largest reduction in recidivism for community-based sex offenders and intensive supervision treatment-oriented programs.

While these other studies provide empirical evidence that rehabilitative efforts are effective at reducing recidivism in a variety of offender population, one meta-analysis is considered the foundation for establishing the principles of effective intervention. In 1990, Andrews, Zinger, Hoge, Bonta, Gendreau, and Cullen conducted a meta-analysis using 45 of the 50 Whitehead and Lab (1989) juvenile studies and an additional 35 adult studies to examine the effectiveness of correctional treatment. Andrews et al., (1990) calculated 154 effect sizes and found an average effect size of .10. However, similar to other researchers, they noticed that there was heterogeneity across the individual program effect sizes. In order to address this issue, Andrews et al., (1990) separated the programs based on certain characteristics and classified programs within three categories: appropriate, inappropriate and unspecified. They then calculated the effect sizes based on these program types and found that appropriate programs had an overall effect size of .30, the effect size of the unspecified group reached .13 and the inappropriate programs demonstrated an increase in recidivism by an average of seven percent. These findings suggest that appropriate programs had reduced recidivism 30% for the treatment group. In particular, the appropriate programs targeted treatment to the highest risk offenders, focused interventions on the criminogenic needs, or crime producing characteristics, of the offenders, and matched the program modality (e.g., cognitive behavioral) with the learning style of the offender. The characteristics of these programs for the basis for the principles of effective intervention (PEI), which can be summarized into risk, needs, responsivity, and fidelity (Gendreau, 1996). It is at this point, where Palmer's (1975) call to identify what programs are

most successful with which offenders and under what conditions began to take shape within correctional research.

The Principles of Effective Intervention

As stated above, Andrews et al., (1990) empirically identified that programs which adhere to the principles of effective intervention were able to reduce recidivism. These principles, risk, need, responsivity and fidelity will be briefly defined and then elaborated on within specific sections in this chapter.

The risk principle, which is the risk to recidivate, has two primary components. The first component is that the risk of the offender be empirically identified and the second is that the most intensive of interventions be reserved for those identified as high risk (Andrews, Bonta and Hoge, 1990; Andrews and Bonta, 2003). Gendreau (1996) explains that by identifying the risk of recidivism through a valid actuarial risk assessment instrument, that these offenders can then be targeted for the most intensive of services and treatment.

Risk factors can be both static and dynamic. Static risk factors, such as criminal history, cannot be targeted for change. However, dynamic risk factors, known as criminogenic needs, are amenable to change. The need principle identifies the criminogenic needs, or crime-producing risk factors, which are to be the primary targets within correctional interventions.

The responsivity principle has two primary aspects, general and specific. General responsivity pertains to the treatment model, and that offenders are most successful in addressing their criminal behavior in programs that follow a cognitive, social learning or behavioral approach. Specific responsivity relates to an offender's potential barriers to treatment. Examples of these barriers can include motivation, mental health, language, and transportation

(Cullen, 2002). Thus, the responsivity principle suggests that offender success is more likely by identifying and removing or addressing these individual barriers prior to or during treatment and directing offenders to programs which have adopted a cognitive, social learning, or behavioral model.

According to the fidelity principle, the most effective programs and correctional interventions are implemented as designed and adhere to the risk, needs and responsivity principles. This process of implementation is often challenging for corrections. Furthermore, while the research on fidelity is limited in comparison to the other principles, there is a growing recognition that there are program characteristics linked to effective programs (Quay, 1977; Antonowicz and Ross, 1994). The following sections in this chapter present the research on each of these principles of effective intervention.

The Relevance of the Risk Principle

As stated previously, the risk principle is based on identifying the risk of the offender to recidivate in the future and matching the intensity and dosage of interventions based on this risk, with a focus toward providing the most intensive of programming and services to the high risk offender (Andrews, Bonta, and Hoge, 1990; Lowenkamp and Latessa, 2002, 2004; Andrews and Bonta, 2003). Further, the risk principle suggests that the low risk group should be provided with less dosage, less intensity, or may not need any treatment or interventions. There is ample research that has consistently demonstrated the iatrogenic effects of mixing low and high risk offenders or providing low risk offenders with services and interventions intended for higher risk offenders. In particular, recidivism rates for lower risk offenders have increased when such strategies have been inappropriately targeted to the lower risk populations (Andrews et al., 1990;

Andrews and Dowden, 2006; Dowden and Andrews, 1999a, 1999b, 2000; Lipsey and Wilson, 1998; Lowenkamp, Latessa and Holsinger, 2006; Lowenkamp and Latessa, 2002, 2004; Lowenkamp, Smith and Bechtel, 2007; Latessa, Lowenkamp, and Bechtel, 2008).

The process of predicting risk is most accurately done with actuarial risk assessment instruments rather than just relying solely on unstructured clinical assessment or professional judgment (Ægisdóttier, White, Spengler, Maugherman, Anderson, and Cook, 2006; Andrews, Bonta, and Wormith, 2006; Grove, Zald, Lebow, Snitz, and Nelson, 2000; Latessa and Lovins, 2010; Meehl, 1954). While the evolution in developing risk assessment began with professional judgment and clinical assessment, also known as first generation assessment, three generations of risk assessment have followed which have built upon the earlier generations' tools (Bonta, 1996). Second generation risk assessments incorporate primarily just static risk factors, such as criminal history items. While criminal history is certainly associated with future risk to recidivate, criminal history factors are not derived from criminological theory (Bonta and Andrews, 2007). Second generation risk assessments, such as the Salient Factor Score, are certainly predictive of recidivism and the criminal history items are often readily accessible within corrections and have face validity. However, given that the tools are comprised of static items, such instruments are unable to assess offender change (Bonta and Andrews, 2007). In response to these limitations from second generation assessments, third generation risk assessment instruments, such as the Level of Service Inventory (LSI) and Level of Service Inventory-Revised (LSI-R), were developed (Bonta and Andrews, 2007, Andrews and Bonta, 1995). Such instruments improved upon the second generation instruments by incorporating theoretically-based dynamic risk factors, or criminogenic needs, into the tools. Research has shown that the dynamic risk factors are as predictive as the static risk factors (Gendreau, Little,

and Goggin, 1996). With this advancement, reassessment of offenders is possible (Bonta and Andrews, 2007). Fourth generation risk assessment, such as the Level of Service/ Case Management Inventory (LS/CMI), marks the next significant advancement in risk assessment. Fourth generation instruments often incorporate a case management process and include a systematic method for collecting information regarding responsivity factors, special offender characteristics (e.g., domestic violence, institutional violence), developing initial and intermediate goals, and conducting reassessments (Andrews, Bonta, and Wormith, 2006; Bonta and Andrews, 2007; Kane, Bechtel, Revicki, McLaughlin, and McCall, 2011). Several of the third and fourth generation risk assessments available are predictive of general recidivism, such as the LSI-R, LS/CMI, the Ohio Risk Assessment System (ORAS), and the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS). In addition, to this, the LSI-R, the LS/CMI and the COMPAS have been shown to be predictive of violent recidivism. Lastly, many of these tools have been shown to be valid predictors of recidivism for both males and females (Holsinger, Lowenkamp, Latessa, 2006a; Holsinger, Lowenkamp and Latessa, 2006b), but the research is still mixed in terms of the predictive validity of risk assessment instruments for different racial and ethnic groups (Fass, Heilburn, DeMatteo, and Fretz, 2008; Holsinger et al., 2006a, 2006b; Kane, Bechtel, Revicki, McLaughlin, and McCall, 2011; Whiteacre, 2006).

The use of risk assessment has grown across the corrections field. A national survey conducted in 1999 found that nearly 75 percent of the responding parole and probation agencies and over 55 percent of community corrections agencies were administering standardized risk assessment instruments (Jones, Johnson, Latessa, and Travis, 1999). In response to growing caseloads, many agencies are adopting a streamlined approach for conducting risk assessments

by implementing a risk screening tool, such as the Level of Service: Screening Version (LSI:SV) that can quickly identify moderate and high risk offenders for the full risk and needs assessment, and avoid conducting the lengthier assessments on the lower risk population (Latessa and Lovins, 2010; Jones, Johnson, Latessa, and Travis, 1999). Risk screening instruments are often static risk instruments, so beyond the identification of risk, there is little information available that identifies the dynamic criminogenic needs of offenders (Latessa and Lovins, 2010). This same 1999 national survey also found that 47 percent of the agencies administering risk assessments had specialized caseloads for various offender groups (Jones, Johnson, Latessa, and Travis, 1999). To assist with the supervision and case management of specific offender populations, there are risk assessments available that are unique for these groups and may be used in addition to risk assessments predictive of general recidivism. Examples of these tools include risk assessments administered to domestic violence offenders, including, but not limited to, the Ontario Domestic Assault Risk Assessment (ODARA), Spousal Assault Risk Assessment (SARA), and the Danger Assessment (DA) (Kropp, Hart, Webster, and Eaves, 1995, 1998; Campbell, 1995; Hilton, Harris, and Rice, 2010). Common risk assessment instruments for sex offender populations include the STATIC-99R, STATIC-2002, STABLE-2007, and the ACUTE-2007 (Hanson, Harris, Scott and Helmus, 2007). There are also assessments to identify offenders with psychopathy and violence, such as the Psychopathy Checklist-Revised (PCL-R) and the Violence Risk Appraisal Guide (VRAG) (Hare, 1991; Hare, 2003; Quinsey, Rice, Harris, Cormier, 2006).

Of particular importance is the recognition that risk assessment instruments may not necessarily be valid predictors of recidivism or appropriately distinguish between low and high risk offenders or be valid for particular groups. Limited funding and resources often precludes

an agency's ability to develop a risk assessment instrument on their particular population. As such, risk assessments, constructed on a different population, are often adopted by correctional agencies. Risk assessments should not necessarily be viewed as 'universal' in the assumption that the instrument will be valid for a different population (Wright, Clear, and Dickerson, 1984). Therefore, risk assessment instruments should be validated on the population in which the tool is being administered (Latessa and Lovins, 2010; Lowenkamp and Latessa, 2002).

Research on the Risk Principle

As previously discussed, there are two primary aspects to the risk principle: (1) identify the risk of the offender with an actuarial risk assessment and (2) match the level of service and intervention to the risk of the offender (Andrews, Bonta, and Hoge, 1990). Over thirty years of research has been fairly consistent in demonstrating the importance of the risk principle (Andrews et al., 1990; Andrews and Dowden, 2006; Dowden and Andrews, 1999a, 1999b, 2000; Lipsey and Wilson, 1998; Lowenkamp, Latessa and Holsinger, 2006; Lowenkamp and Latessa, 2004; Lowenkamp, Smith and Bechtel, 2007; Latessa, Lowenkamp, and Bechtel, 2008; Lipsey, 1995, 2009). Much of the empirical support for the risk principle summarized below is contained in meta-analyses; however, there are several individual studies also discussed.

The meta-analysis conducted by Andrews et al., (1990) examined 80 juvenile and adult studies in an effort to test the risk, need, and responsivity principles and ultimately found that adherence to the risk principle was essential to reducing recidivism. While the overall effect size suggested a ten percent reduction in recidivism, appropriate programs, which targeted higher risk offenders, experienced an average 30 percent reduction in recidivism. Programs that targeted low risk offenders were identified as inappropriate and were found in increase recidivism by

seven percent. Andrews and Bonta (1998) re-examined these data and noted that reductions in recidivism was increased nearly five times for programs targeting higher risk than program which mixed risk levels.

Andrews conducted four additional meta-analyses with Dowden (1999a, 1999b, 2000, 2006) and found empirical support for adhering to the risk principle. In a meta-analytic review of 26 studies examining various female juvenile and adult samples, they concluded that the risk principle applied to women. Recidivism had increased nearly four percent for low risk female programs; however, programming targeting higher risk females resulted in an effect size of .19. Overall, this meta-analysis suggested that the effect size was nearly six times greater when adhering to the risk principle (Dowden and Andrews, 1999a). A subsequent 1999 meta-analysis completed by Dowden and Andrews (1999b) examined 229 studies of juvenile and youthful offender programs. Similar to the other 1999 study, the effect size increased nearly four times for programs which adhered to the risk principle (Dowden and Andrews, 1999b). Dowden and Andrews (2000) conducted a meta-analysis on 35 juvenile and adult studies focusing on the impact of violent recidivism. Programs that adhered to the risk principle produced an effect size of .09 in comparison to the programs that did not adhere to the risk principle which resulted in a .04 effect size. While these findings did not reach statistical significance, these results still indicated that adherence to the risk principle was two times greater when the risk principle was followed. Andrews and Dowden (2006) found modest support for the risk principle for young offender and female programs, especially when programs incorporated the need and responsivity principles. However, these researchers noted that risk was not consistently measured across the individual level studies included in the meta-analysis which potentially could have impacted the effect sizes (Andrews and Dowden, 2006).

Wilson, Gottfredson, and Najaka (2001) conducted a meta-analysis examining 165 studies focusing on the effectiveness of school prevention programs to reduce delinquency, alcohol and drug use, truancy, and other behavioral problems. In particular, these primary studies involved programs related to not just instruction, but were focused specifically on behaviorally-based program models for students. The effect size was three times greater when the programs were directed toward higher risk juveniles. Two years later, Wilson, Lipsey and Derzon (2003) conducted another meta-analysis on 221 studies evaluating the effectiveness of school-based programs designed to reduce juvenile aggression which suggested that these programs were most successful with higher risk youth. In a follow-up study, Wilson and Lipsey (2005) increased the study sample to 372 school-based evaluations and again found that programs to target juvenile aggression were most successful for the higher risk participants. Specifically, effect sizes across the various program types ranged from .06 to .29.

Lowenkamp, Smith and Bechtel (2007) conducted a meta-analysis which included 42 studies. This meta-analysis provided some indication that mixing risk levels within offender treatment programs was harmful. In particular, programs which mixed risk levels increased recidivism an average of 18 percent. Similar to Andrews and Dowden (2006), these researchers concluded that there was a common concern across the majority of studies reviewed for eligibility in the meta-analysis, which was the lack of information related to reporting the risk levels of the treatment and comparison groups based on any actuarial risk assessment.

Echoing this concern and recognizing that meta-analysis is potentially limited in measuring how risk is applied in various correctional programs and interventions, Lowenkamp, Latessa, and Holsinger (2006) conducted a study which combined two existing datasets with a combined 97 residential and non-residential correctional programs to examine how the risk

principle impacts recidivism when programs vary intensity and length based on the offender risk level. When just comparing the residential programs and the non-residential programs, the residential programs were found to have reduced recidivism 3 percent, whereas the non-residential programs increased recidivism by an average 12 percent. However, when examining the impact of the risk principle on program effectiveness, regardless of program setting (residential or non-residential) when the risk principle was followed, reductions in recidivism were observed. Specifically, this research was able to clearly distinguish that when programming, services and referrals were slightly increased and program length was longer for higher risk offenders, recidivism was reduced.

One of the datasets from the Lowenkamp, Latessa, and Holsinger (2006) study was taken from an earlier study conducted by Lowenkamp and Latessa (2002). The sample from these data included 13,221 offenders. Within the treatment group were offenders placed within one of 38 Ohio Halfway Houses (HWH) or 15 Community-based Correctional Facilities (CBCF) and in the comparison group were parolees not directed to participate in the OH HWH and CBCF facilities. In addition to matching these offenders based on sex and county of supervision, a modified Salient Factor Score was produced so that these two groups could be matched based on risk level. The recidivism measure, incarceration, was tracked for two years. High risk offenders within the treatment group were found to have an average decrease in recidivism by eight percent and low risk who were program participants in the HWH or CBCF increased recidivism an average of four percent in comparison to the group that received straight parole. A later study by Lowenkamp and Latessa resulted in similar findings in demonstrating that recidivism increases for lower risk offenders when intensive services are provided, these same intensive

services applied to higher risk offenders resulted in recidivism reductions from 10 to 30 percent (Lowenkamp and Latessa, 2005).

Research examining supervision and the risk principle has mimicked these same findings (Bonta, Wallace-Capretta, and Rooney, 2000). In particular, Bonta, Wallace-Capretta, and Rooney (2000) examined the impact of intensive rehabilitation supervision on offenders and found that for the higher risk group, such an intervention resulted in a 20 percent reduction in recidivism. However, this same intensive supervision increased recidivism by 17 percent for the lower risk offenders.

Research related to the concepts of dosage, intensity, and duration of programming and services based on the risk principle have produced some significant findings and provided practice-based applications, but this focus of research appears to still be relatively new to the corrections literature. Certainly, the extant research indicates that higher risk offenders require the most intensive of treatment and services (Lowenkamp, Latessa, and Holsinger, 2006; Lipsey, Landenberger, Wilson, 2007), but how dosage and intensity are defined and measured is still requiring refinement. For example, Lowenkamp, Latessa, and Holsinger (2006) found reduced recidivism rates for programs that increased length and intensity for higher risk offenders. Lipsey, Landenberger, and Wilson (2007) conducted a meta-analysis, which included 58 studies and found that cognitive behavioral programs that targeted moderate and higher risk offenders along with increasing the number of sessions to two or more per week saw the greatest effect, nearly 50% reduction. Further, lower risk offenders do not require such intensity and when exposed to correctional interventions designed for the higher risk offender, often this has produced harm.

Andrews and Bonta (2007) have noted that the dosage and intensity of services should be directly related to the risk level of the offender. Gendreau and Goggin (1995) came to this conclusion as well and recommended that higher risk offenders should spend 40 percent to 70 percent of their time engaging in structured prosocial activities for a period of time ranging between three to nine months. Bush (1995) recommended that programming should last no less than six months. While these previously mentioned studies provide support for the risk principle, the practical implications related to identifying the appropriate amount of dosage for higher risk offenders is worthy of further exploration. Below is a brief summary of the research that has measured dosage based on program length and treatment hours.

Lipsey's (1999) meta-analysis of 200 studies examining juvenile offenders measured dosage as the length of the program and number of hours. The largest effect sizes were observed for programs that were six months in length and included 100 hours of programming. Yessine and Kroner (2004) examined the impact of dosage on recidivism based on the number of group sessions completed within a cognitive behavioral community-based program for male offenders. The risk for a new offense in the community was increased 1.78 times for participants who spent less than six sessions in the group and the risk for a new revocation was increased 2.92 times. Participation that lasted the full 25 sessions was marked by a 49% reduction in revocations and 35% reduction in new offenses.

Bourgon and Armstrong (2005) examined the impact of prison-based treatment program dosage, as measured in hours, on recidivism for a sample of 620 offenders. The recidivism measure was defined as any subsequent incarceration resulting from a parole supervision revocation or a new conviction. The majority (N=482) of offenders in the treatment sample were assigned to programming that lasted five, ten, or fifteen weeks and the comparison group

received no programming. The five week program provided 100 hours of programming, 200 hours of programming was offered for the ten week program, and the 15 weeks of programming delivered approximately 300 hours of programming. Offenders' risk, needs, and responsivity factors were separately assessed using a battery of assessment instruments, including the Level of Service Inventory – Ontario Revision (LSI-OR) to assess risk and needs, the Criminal Sentiments Scale, the Paulhus Deception Scale, the Attitude Toward Correctional Treatment, and the Beck Depression Inventory. The follow-up time period to measure recidivism was twelve months after release. Overall, thirty-one percent of the program participants recidivated in comparison to 41 percent for the non-program participants. While the treatment group experienced a ten percent reduction in recidivism compared to those who did not receive treatment, Bourgon and Armstrong (2005) found that positive effects varied based on risk level and length of programming. Specifically, when comparing high risk with multiple needs for the 15 week program model, the treated group's recidivism rate was 38% in comparison to the untreated group's recidivism rate of 59%. While sample size may be a limitation with comparing the recidivism rates of these two groups, this difference was not found to be statistically significant. However, the recidivism rates for the high risk and multiple needs group who participated in the 15 week program were significantly lower than those who participated in the 5 week program. Specifically, programming that only lasted 100 hours was not adequate to reduce recidivism for the high risk group and the recidivism rates for the treated high risk group that participated in the five week program were similar to the untreated 15 week comparison group, 62% and 59% respectively. One hundred hours of programming was sufficient for moderate risk with three or fewer criminogenic needs. Recidivism was reduced nearly sixteen percent when one hundred hours of treatment was provided for moderate risk offenders with few

criminogenic needs. Two hundred hours of treatment was appropriate for moderate or high risk offenders with few needs and resulted in a fourteen percent reduction in recidivism. Given these results, the conclusion was that 300 hours of programming may not be sufficient for high risk and high needs (Bourgon and Armstrong, 2005).

The setting for the Bourgon and Armstrong (2005) study was within a prison setting. To test the impact of risk-based dosage on recidivism in a community-based residential setting, Sperber, Latessa, and Makarios (2013b) operationalized these similar dosage levels for 689 low, moderate, and high risk offenders successfully released from an Ohio Community-Based Correctional Facility between August 30, 2006 through August 30, 2009. Specifically, 0 to 99 hours of programming was identified as low dosage, 100 to 199 hours of programming was considered moderate dosage, and high dosage was defined as 200 or more hours of programming. High risk offenders who received moderate programming dosage recidivated at a rate of 81% in comparison to the high risk offenders who received a high dosage of programming and recidivated at a rate of 57%.

To address specific limitations in treatment dosage research regarding the lack of refinement in calculating dosage, Makarios, Sperber, and Latessa (2014) replicated and expanded upon their earlier study that grouped dosage amounts based on categories of 100 hours of dosage (Sperber et al., 2013b). By increasing the earlier study sample size comprised of 689 adult male offenders to a sample size of 903 offenders, this recent study examined the impact of dosage on recidivism by LSI-R risk level. Dosage was measured by participation in cognitive behavioral programming, based on ranges of 50 hours rather than broader categories of 100 hours of dosage. Similar to the low dosage range from the earlier study, the minimum dosage with this larger sample remained at 0 to 99 hours of cognitive behavioral programming. Within the recent study,

low dosage was measured between 100 to 149 hours, low-medium dosage was measured between 150 to 199 hours, medium dosage was measured between 200 to 249 hours, high dosage was measured between 250 to 299 hours, and maximum dosage was 300 or more hours of cognitive behavioral programming (Makarios et al., 2014). The findings suggested that the amount of dosage does vary by risk level and that the relationship is not linear. By examining these refined dosage categories, the low/moderate risk group experienced the lowest recidivism rate of 14% when participating in 100 to 149 hours of cognitive programming. This is 23% recidivism reduction when compared to low/moderate risk who only participated in 0 to 99 hours of programming. Further, recidivism rates increased to 30% for low/moderate risk offenders who received 150 to 199 hours of programming. Similar non-linear results were revealed when examining the moderate risk group as the largest effects were observed when dosage ranged between 150 to 199 hours and 200 to 249 hours, but increases in recidivism were noted when dosage was below 150 hours or above 249 hours (Makarios et al., 2014).

These studies provide preliminary evidence that the greatest recidivism reductions are observed for high risk offenders when programming and interventions are provided at the highest dosage. Sperber, Latessa, and Makarios (2013a) summarized the multiple gaps related to risk-based dosage in the literature and the field. These include (1) no consistent definition on how to measure dosage, (2) identifying what services, interventions, and activities constitute dosage, (3) no consistent method to measure dosage other than in programming, (4) lack of clarity on whether program effectiveness is impacted when intensity, such as 300 hours of programming, is provided in weeks or in months, (5) determining if there is a cumulative dosage effect needed based on the offender's risk, (6) examining the impact of dosage based on program or intervention, (7) examining the impact of dosage for various offender groups (e.g., gender,

offense type – sex offender, domestic violence offender), (9) determining the individual response to dosage based on progress with treatment, (10) assess if responsivity factors moderate the relationship between risk-based dosage and recidivism, (11) identify if there is a maximum amount of dosage needed at which point no further reductions in recidivism are observed and if this varies based on offender characteristics.

In sum, there is an extraordinary amount of research indicating that adherence to the risk principle is essential for reducing risk for the high risk offender and reducing harm for the lower risk offender. By using valid and actuarial risk assessment instruments, correctional agencies can properly identify the risk levels of their population and appropriately allocate programming and services, as well as the dosage of the intervention needed to reduce recidivism. The next section in this chapter reviews the empirical research on the need principle.

The Relevance of the Need Principle

The need principle focuses on identifying the dynamic risk factors that are related to criminal attitudes and behavior and indicates that these criminogenic needs are to be the primary targets within correctional interventions and treatment. Unlike static risk factors (e.g., criminal history, history of substance abuse) which can't be changed with interventions and treatment, programming which focuses on an offender's dynamic criminogenic needs can reduce future offending (Andrews and Bonta, 1998, 2006; Andrews, Bonta, and Hoge, 1990; Gendreau, 1996; Gendreau, Little, Goggin, 1996; Simourd and Andrews, 1994). Andrews and Bonta (1998, 2006) and Gendreau, Little, and Goggin (1996) identified the primary eight central risk and need factors found to be related to recidivism. The first four, commonly known as the "Big Four" include three dynamic risk factors and one static risk factor. The static risk factor is prior

antisocial behavior, or criminal history (Andrews and Bonta, 2003, 2006). The three criminogenic needs within the Big Four include antisocial personality, antisocial peers and antisocial attitudes/cognitions. Antisocial personality includes lack of empathy, impulsivity, aggression/hostility and poor problem solving skills. These three criminogenic needs should serve as the primary treatment targets for high risk offenders. Additional secondary criminogenic needs which should be targeted within correctional interventions include: substance abuse, lack of employment, poor educational achievement, lack of structured and routine leisure and recreation, poor communication, and low family affection (Andrews and Bonta, 1994, 2006; Simourd and Andrews, 1994).

While all of these criminogenic needs are considered appropriate targets for high risk offenders, one study on Pennsylvania parolees provided evidence that the primary criminogenic needs, antisocial personality, peers, and attitudes and cognitions are a priority for high risk. Zajac and Bucklen (2006) surveyed a sample of successful parolees and unsuccessful parolees who were subsequently revoked back to the Pennsylvania Department of Corrections. While housing and employment are understandably important for offender success and typically serve as conditions of supervision, these two risk factors are not what distinguished the successful and unsuccessful parolees. Rather, Zajac and Bucklen (2006) found that unlike the successful parolees, the parolees who returned to prison did not have realistic expectations about their lives after release, maintained antisocial attitudes and beliefs, and did not have effective problem solving or coping skills. In comparison to the successful parole group who reported having positive relationships and support systems, the parole violators continued to have antisocial peers in their lives and ongoing substance abuse issues. What was unique in these survey results was that both groups reported that housing was obtained as well as employment. While housing and

employment are recognized criminogenic needs, this study highlighted the importance of targeting the "Big Four" and specifically antisocial attitudes, peers, and personality for high risk groups.

In addition to identifying these criminogenic needs, Andrews and Bonta (2010) clearly state that the need principle distinguishes between non-criminogenic and criminogenic needs. Programming and interventions that have primarily targeted factors not associated with crime producing behaviors have not been as successful in reducing recidivism (Gendreau, French, and Taylor, 2002). Examples of non-criminogenic needs include self-esteem, trauma, victimization and maturity, and these factors have not been consistently associated with reductions in high risk behaviors and recidivism despite being sources of program intervention (Andrews and Bonta, 2010; Dowden and Andrews, 1999, Gendreau, Little and Goggin, 1996). As Wormith (1984) describes, targeting self-esteem in treatment will likely result in a very confident offender.

Criminogenic needs, similar to static risk factors, are best identified through the administration of a risk and needs assessment instrument as these are also valid predictors of future recidivism (Brown, 2002; Gendreau, Little and Goggin, 1996; Gendreau, Goggin and Smith, 2002; Hanson and Harris, 1998; Hoge and Andrews, 1996; Lipsey and Derzon, 1998; Jones-Hubbard and Pratt, 2002). Brown (2002) examined the validity of dynamic risk assessments on recidivism. The sample was comprised of adult offenders and recidivism was measured pre-release, one month after release and three months after release. Findings from this study indicate that the dynamic risk factors were significantly more predictive than the strongest static risk model. In addition to this, Brown (2002) noted predictive validity was improved upon, albeit not significantly, when the model had combined both static and dynamic risk factors. Two studies conducted by Gendreau et al., (1996) and Law and Motiuk (1998) shared these results

with Brown (2002) in demonstrating that dynamic risk factors are some of the strongest predictors of recidivism and Lowenkamp and Latessa (2005) suggested that the combination of static and dynamic risk predictors provides the most accurate assessment of risk.

Third and fourth generations assessment instruments such as those described previously, including the LSI-R, LS/CMI, COMPAS, the Wisconsin Risk and Needs Assessment and the ORAS all identify criminogenic needs. Criminogenic needs identified by a valid risk and needs assessment instrument then serve as the intermediate targets to identify for treatment and case management plans and to address in programming (Andrews and Bonta, 2010, Bonta, 2002). Further, in order to measure change in risk, criminogenic needs serve as the primary factors to examine when conducting re-assessments (Bonta and Andrews, 2007).

Much of the research cited regarding the impact of the risk principle on recidivism found similar support in the application of the need principle, including by gender, age, race and ethnicity (Andrews et al., 1990; Andrews, Dowden, and Rettinger, 2001; Cleland, Pearson, and Lipton, 1996; Dowden and Andrews, 1999a, 1999b, 2000; Gendreau, French and Taylor, 2002; Lipsey, 1989, 1995; Losel, 1995; Lowenkamp, 2004). Andrews et al., (1990) were unable to examine the actual effects of criminogenic needs on recidivism, but these researchers did observe that the programs identified as 'appropriate' targeted criminogenic needs, whereas, the 'inappropriate' programs failed to consistently target these dynamic risk factors. Dowden and Andrews (1999a) concluded that programs which target criminogenic needs for female offenders were most effective at reducing recidivism. The effect sizes for programs which targeted criminogenic needs was .26, but for programs that focused on non-criminogenic needs, the effect size was just .04. Dowden and Andrews' (2000) meta-analysis examining juvenile and adult programming found that programs which target criminogenic needs saw recidivism reductions

close to 20 percent; however, programs that focused mostly on non-criminogenic needs produced no effect.

An important meta-analysis which examined the density of criminogenic needs in prison-based programming was conducted by Gendreau, French, and Taylor (2002). These researchers identified 68 studies that evaluated the effectiveness of treatment programs and correctional interventions on institutional misconduct. Overall, this study found that programs which reduced prison misconduct saw later reductions in recidivism. More importantly, Gendreau et al., (2002) observed that correctional treatment which targeted more criminogenic needs saw greater decreases in misconduct. In particular, programs which targeted only non-criminogenic needs no effect of a slight increase in recidivism, programs that targeted up to two criminogenic needs saw about a ten percent reduction in recidivism, and programs which targeted three to eight criminogenic needs reached average effect sizes of .29. This study is important from a practitioner perspective in recognizing that program targets should not only be focused on criminogenic needs, but should target no less than three for higher risk offenders.

Lowenkamp and Latessa (2002, 2005) examined the application of the need principle within their Ohio Halfway House study. They found that programs which offered only one service to target criminogenic needs saw an average increase in recidivism of seventeen percent. Programs that offered two to three criminogenic services saw an average reduction of recidivism of three percent. Finally, programs that provided four or more criminogenic services saw recidivism reductions on average of seven percent. These findings were also observed by Lowenkamp (2004) in examining program integrity and treatment effectiveness. When programming and services targeted criminogenic needs, program effectiveness was found to produce reductions in recidivism (r=.39).

The research is consistent on the importance and application of the need principle. Corrections should conduct risk and needs assessments to identify what criminogenic needs should be targeted for change in treatment. As we know from the risk principle, programming and interventions are intended for the higher risk offenders. The high risk population will, as expected, have the greatest number of criminogenic needs. For programming to be effective and reduce recidivism for high risk offenders it should target three or more criminogenic needs services.

The Relevance of the Responsivity Principle

As previously discussed, the responsivity principle has two primary components, general responsivity and specific responsivity. To distinguish between the two, specific responsivity factors are unique to the individual offender whereas general responsivity attends to the programmatic approaches that work best with offenders in terms of addressing their needs. Specifically, general responsivity implies that offenders are most responsive, or successful, in treatment programs that have adopted a cognitive, social learning or behavioral approach to address an offender's criminogenic risk factors. Specific responsivity suggests that offenders may have unique barriers that could potentially impact treatment success. Thus, specific responsivity is individualistic. These obstacles to treatment can include a number of factors, including trauma, motivation, mental health, anxiety, cognitive functioning, language, child care, and transportation (Cullen, 2002). These responsivity factors appear within offenders who demonstrate poor social and verbal skills, poor problem solving or coping skills, and possess more concrete, rather than abstract, cognitive abilities (Bonta, 1995).

Therefore, success is more likely for offenders when specific responsivity factors are identified and removed prior to or addressed throughout treatment and interventions (Andrews and Bonta, 1998). Further, application of the responsivity principle within treatment suggests that offenders participate in programming and interventions that follow a cognitive, social learning, or behavioral model. Collectively, application of the responsivity principle involves identifying and addressing these specific responsivity factors and then matching the treatment program and staff to the unique characteristics of the offender.

General Responsivity

As previously mentioned, programs should adopt a cognitive, social learning or behavioral treatment model in order to be effective with offenders (Andrews et al., 1990). Cognitive and social learning or behavioral models are grounded in psychological theory and the research related to behavior. Bandura's (1973, 1977) social learning theory argued that there are components into how learning is achieved. Unlike Akers (1985) who did not emphasize the role of cognition and followed a more sociological orientation for describing the process of learning, Bandura (1979) contends the importance of cognitions, observation, and modeling, in understanding how behavior is learned. In particular, Bandura (1979) argued that according to his definition of social learning theory, criminal behavior is learned by observing those who model antisocial behavior and attitudes. Further, the cognitions that prompt, support or reinforce criminal behavior will encourage this behavior to be learned. Bandura (1973) tied cognitions to each aspect of learning criminal behavior. First, in order to explain aggressive behavior, Bandura (1979) recognized that acquisition of skills is necessary to produce the behavior, and this can be done through direct experience or observation. Second, these criminal actions are then encoded into memory through a cognitive process. Third, these memories are then

transformed into practice and rehearsal. Fourth, cognition then appraises if the criminal behavior is rewarded or punished. Fifth, cognitive restructuring can then be used to rationalize or justify the antisocial behavior (Bandura, 1979). There are certainly other perspectives to explaining and operationalizing how criminal behavior is learned or emerges (Akers, 1985; Raine, 1993; Moffitt, 1993), but it is Bandura's (1973) distinct inclusion of cognitive processes that defines the cognitive treatment approach recommended for offending populations.

Typically cognitive programming comes in two types: (1) cognitive skills or (2) cognitive restructuring, but some programs have a model which is a combination of both (Ross and Fabiano, 1985). These two types have a shared goal, however, of improving cognitive processes related to decision-making, conflict management, and empathy.

One approach of cognitive restructuring, known as rational emotive therapy focuses on teaching the offender that emotional states are not a result of activating experiences but rather their irrational thoughts and beliefs. To address this, offenders have to dispute the irrational belief (e.g., ignoring the positive and dwelling on the negative, guilt) and adopt or substitute a rational belief (Burns, 1980; Ellis, 1973). These rational beliefs will lead to more positive emotional states and better decision-making. It is the maladaptive thought that prompts the antisocial response (Ellis, 1973).

Related to cognitive skills approaches, Miechenbaum is typically credited for his work toward developing cognitive skills approaches, such as self- instructional training and stress inoculation (Miechenbaum and Jaremko, 1982). Self-instructional training teaches a client to talk through difficult situations. The actual training involves a counselor modeling this for a client and then repeats the process but also states the actual instructions for each step. Similarly,

stress inoculation follows this same approach but includes an additional step which involves the client encouraging and reinforcing themselves. Greenwald (1973) developed Direct Decision Therapy. This approach expects that the counselor assist the client with making different decisions to change behavior and then to actually guide the client through the steps to carry out the decision. Given the importance of the counselor's role in cognitive skills approaches, general responsivity does place value on the therapeutic relationship (Ahn and Wampold, 2001; Wampold, 2007).

With the various cognitive approaches described, cognitive models are often referred to as cognitive behavioral because of their shared fundamental concepts. Cognitions and behaviors are learned. Behavior is prompted, supported, mediated and reinforced through the cognitive process. Modeling and role playing are a component of learning new behaviors (Bandura, 1973). Finally, Cullen and Gendreau (2000) appropriately describe behavioral programs to follow one core concept, namely that operant conditioning is used to change behavior. Operant conditioning suggests that behavior is learned whenever it is reinforced.

A number of cognitive programs can be found within correctional settings and juvenile justice settings and are applicable for both males and females. For example, Functional Family Therapy (Alexander and Parsons, 1969, 1971), Multi-Systemic Therapy (Henggeler and Borduin, 1990), and Aggression Replacement Training (Goldstein and Glick, 1987) are three commonly identified cognitive program models for juveniles.[1] Cognitive approaches typically found in programming for adults include Thinking for a Change (Glick, Bush and Taymans, 1997; 2002),

[1] Aggression Replacement Training has recently been adopted within some adult offender programs.

Moral Reconation Therapy (Little and Robinson, 1986), and Reasoning and Rehabilitation (Ross and Fabiano, 1985).[2]

Both individual studies and meta-analyses have found consistent empirical support in the application of general responsivity for programs that have adopted a cognitive or social learning model (Gendreau and Ross, 1979, 1987; Andrews and Bonta, 1998; Andrews et al., 1990; Izzo and Ross, 1990; Antonowicz and Ross, 1994; Henning and Frueh, 1996; Lipsey and Wilson, 1998; Andrews and Dowden, 1999; Baro, 1999; Lipsey, Chapman and Landenberger, 2001; Lipsey, 2001, 2009; Pearson, Lipton, Cleland, and Yee, 2002, Lowenkamp, 2004; Landenberger and Lipsey, 2005; Wilson, Bouffard and MacKenzie, 2005; French and Gendreau, 2006).

Gendreau and Ross (1979, 1987) conducted narrative reviews and found that behaviorally-oriented programs, such as those who have adopted contingency contracts, token economies, or provided an incentive or reward system, are quite effective in changing behavior. Cullen and Gendreau (2000) summarized that effective cognitive behavioral approaches teach offenders to identify the original problem, identify and select goals for resolving the problem, and to develop and implement a prosocial response.

Multiple meta-analyses have demonstrated the effectiveness of programs which have adopted cognitive behavioral models. Andrews et al., (1990) noted that cognitive behavioral programs which adopted a structured, directive and skills oriented approach were generally more effective in reducing recidivism than unstructured programs. Of the 80 studies within their meta-analysis 23 studies specified the program model, which produced 41 effect sizes within their study. In particular, cognitive behavioral approaches resulted in average effect size of .29 in

[2] Moral Reconation Therapy and Thinking for a Change is also used in juvenile settings.

comparison to .04 for programs that did not follow a cognitive model. The follow-up meta-analysis conducted by Andrews and Bonta (1998) increased the effect sizes for program model to 60 and significant increases in effect sizes were observed with these additional studies. Overall, these findings from Andrews et al., (1990) and Andrews and Bonta (1998) suggest that cognitive behavioral program models are effective for males and females regardless of age or setting. The following discussion begins by reviewing the effectiveness of cognitive behavioral approaches in juvenile populations.

Davidson (1984) investigated 90 community and residential programs for juveniles and found a meaningful, but not significant reduction in delinquency for behavioral programs. Garrett's (1985) meta-analysis, often cited for reporting the largest effect sizes related to the treatment principle, reviewed all studies on juvenile programming from 1960 through 1983. The final sample size included 111 studies and over 13,000 youth. When examining a variety of treatment approaches, psychodynamic resulted in the weakest effect sizes (.17); however, the average effect size for behavioral approaches was. 60. Garrett (1985) disaggregated the samples based on scientific rigor and found that the less rigorous studies resulted in an effect size of .86 and the rigorous studies averaged an effect size of .30 for behavioral approaches. In addition to these findings, Garrett (1985) found that for cognitive behavioral models, the average effect size reached .58 and higher effect sizes were observed for programs which involved family approaches and contingency management, .81 and .86 respectively. Izzo and Ross (1990) conducted a meta-analysis involving the effectiveness of correctional programs with juveniles between 1970 through 1985. Forty-six studies from published refereed journals were included in their meta-analysis. Only two variables were found to have a positive effect on juvenile recidivism, location and program type. In particular, cognitive approaches were more than twice

as likely to reduce recidivism. In Lipsey's (1992) meta-analysis which did include published and unpublished studies from 1950 through 1987. There were 24 individual effect sizes related to behavioral therapy. For the programs that implemented a multimodal and cognitive behavioral approach the average effect size was .30. Given that the overall average effect size examining all 443 effect sizes was .10, this was a substantial increase.

Additional meta-analyses have noted similar results. Dowden and Andrews (2000) found that cognitive behavioral programming for violent offenders reduced recidivism by 18 percent. Pearson et al., (2002) conducted a meta-analysis on 69 evaluation studies on behavioral and cognitive behavioral programs. Cognitive behavioral programs saw an average of recidivism reduction of 30 percent and were found to be slightly more effective than behavioral approaches. Similarly, the meta-analysis completed by Wilson, Bouffard and MacKenzie (2005) on 20 studies examining cognitive behavioral group programs found upward of a 30 percent reduction in recidivism. Lipsey, Chapman, and Landenberger (2001) reviewed 14 studies to examine the effectiveness of cognitive behavioral interventions. Eligible studies were limited to experimental and quasi-experimental studies that focused on cognitive change within the description of the program model. Offenders within the cognitive behavioral programs experienced the largest recidivism reductions in comparison to those who received no treatment. Landenberger and Lipsey (2005) conducted a very rigorous meta-analysis which involved an extensive and exhaustive process in identifying studies and located a total of 4,434 citations of adult and juvenile studies, of which, 1,000 appeared to meet the minimum criteria for review, but only 58 studies met all eligibility criteria. Overall, they found an average of a 25 to 30 percent reduction in recidivism for cognitive behavioral programs. Upon further examination of cognitive behavioral programs with high completion rates, multiple group sessions and increased treatment

hours, were all found to have a significant impact on recidivism. Similar findings to the earlier meta-analyses regarding the effectiveness of cognitive behavioral approaches was noted by Lipsey (2009), who concluded that the average effect size of such program models was .26.

Individual studies that have examined the effectiveness of cognitive behavioral approaches include reviews of previously mentioned treatment programs. One example is the quasi-experimental evaluation of the National Institute of Correction's Thinking for a Change program (Glick, Bush and Taymans, 1997; 2002). Lowenkamp, Hubbard, Makarios, and Latessa (2009) examined the impact of this program on 121 probationers convicted of felonies from Tippecanoe County, Indiana. The comparison group was comprised of 96 offenders. Findings from this study concluded that 23 percent of the treatment group recidivated, whereas, 36 percent of the comparison group were re-arrested. As Lowenkamp et al., (2009) point out, that after controlling for sex, age, and risk, the comparison group was 57 percent more likely to recidivate.[3]

Using the data from the original Ohio Halfway House study several studies have concluded the effectiveness of cognitive behavioral approaches (Lowenkamp, 2004; Lowenkamp and Latessa, 2005, and Lowenkamp, Latessa, and Holsinger, 2006). Lowenkamp and Latessa (2005) observed a ten percent reduction in recidivism for cognitive behavioral programs, whereas no effect was found for other treatment approaches. Further, when isolating actual cognitive behavioral techniques, such as role playing and graduated rehearsal of newly learned skills from these programs, programs that rarely use these techniques were found to have only a three percent reduction in recidivism, programs which practice one of these techniques saw an

[3] It should be noted that the treatment group was comprised of offenders who had a slightly higher risk to recidivate than the comparison group.

average recidivism reduction of eight percent. Finally, programs which routinely used role playing and graduated rehearsal experienced an average 18 percent recidivism reduction. Lowenkamp, Latessa, and Holsinger (2006) found that cognitive behavioral programs were significantly more effective than programs adopting a different treatment approach.

In sum, there is substantial empirical evidence supporting cognitive behavioral approaches in working with offending populations. Further, programming that implements structure, cognitive behavioral techniques that identify that involve skills development and skills practice, as well as reinforcement of prosocial attitudes and behaviors have been found to be the most effective. The discussion on specific responsivity follows.

Specific Responsivity

As previously mentioned, specific responsivity recognizes that individual characteristics can pose potential barriers to treatment. While these factors are not typically statistically related to criminal behavior, unlike dynamic and static risk factors, the identification of specific responsivity characteristics is important as these issues should be addressed prior to and during treatment to increase the likelihood of success during correctional interventions (Andrews and Bonta, 1998).

Specific responsivity factors are unique to the individual offender, which is why the core concept of matching the treatment and counselor to the offender's specific characteristics is essential and closely models the approach found in psychology (Andrews and Bonta, 2010; Kazdin, 2008). Treatment barriers can include a variety of factors, including gender, ethnicity, trauma, motivation, mental health, anxiety, cognitive functioning, language, child care, and transportation (Andrews and Bonta, 2010; Cullen, 2002).

There are assessment instruments to identify various specific responsivity factors for offenders. Assessments for cognitive abilities, personality types, and even motivation are available. For example, three assessments are available to examine motivation or readiness for treatment. The first is the Stages of Change Questionnaire developed by Prochaska and DiClemente and independently validated by Tierney and McCabe (2004) on a sample of sex offenders. A second tool for examining motivation is the self-reported University of Rhode Island Change Assessment Scale (URICA) which is also based on the Stages of Change Model proposed by Prochaska and DiClemente (DiClemente and Hughes, 1990; McConnaughy, Prochaska, and Velicer, 1983). The third instrument, also based on the Stages of Change model, is called the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). While this is closely modeled off the URICA, the SOCRATES is intended for substance abuse populations and contains questions specific to this area.

There are a variety of cognitive and academic assessments available including the Weschler Adult Intelligence Scale (Weschler, 1997), Culture Fair IQ Test (Cattell, 1973) and the Test of Adult Basic Education, TABE. These forms of cognitive assessments are also available for juvenile populations. In addition, the Jesness Inventory (Jesness, 1996) and the Minnesota Multiphasic Personality Inventory, MMPI (Megargee, Carbonnell, Bohn and Sliger, 2001) are available to diagnose offender personality types. While tests for motivation are often completed by the offender, these cognitive and personality assessments are diagnostic instruments which often require advanced degrees, training and certifications to administer. This may pose a primary reason as to why specific responsivity is not assessed within corrections. However, including motivation, some of the other specific responsivity factors, such as lack of transportation, language, child care can be readily determined by case managers that have been

trained to ask about these needs or simply recognize the importance for asking offenders about these issues.

Gendreau and Ross (1979, 1987) observed within their narrative reviews that correctional programs which identified individual characteristics were much more effective when taking the offender's unique learning styles into account. While not a direct test of specific responsivity, Andrews et al., (1990) a characteristic of appropriate programs included recognition for specific responsivity factors and these appropriate programs did result in the largest reductions in recidivism.

Related to personality types, there is one primary study that examined program effectiveness based on personality subtypes identified by the Jesness Inventory (Van Voorhis, Spruance, Ritchie, Listwan, Seabrook, and Pealer, 2002). Van Voorhis et al., (2002) conducted an experiment involving the effectiveness of the cognitive behavioral program, Reasoning and Rehabilitation, when considering personality types. The recidivism measure was re-incarceration and the location of this study was Georgia. Offenders were classified into four personality groups: (1) neurotic, (2) asocial aggressive, (3) dependent, and (4) situational. Dependent and situational offenders were the most successful within the program' however, those diagnosed as being neurotic had the highest recidivism rates.

As previously mentioned, cultural, racial and ethnicity can be viewed as a specific responsivity factor. Similar to examining the validity of risk assessment instruments by gender and race or ethnicity, a meta-analysis comparing the effectiveness of juvenile programs for minority and non-minority youth was conducted by Wilson, Lipsey, and Soydan (2003). These findings noted that interventions provided to both juvenile groups were effective in reducing

future delinquency and these results were closely mirrored in Lipsey's (2009) meta-analysis. Kane et al., (2011) explored the role of specific responsivity within supervision for Hispanic and American Indian offenders. The researchers provide a detailed description related to the cultural context found within these groups and also note the statistics related to minority growth within United States correctional settings. This study tested a cultural competency scale which was developed to assess the level of cultural responsivity found within participating probation agencies. The scale was comprised of the following factors: (1) the site collects data on language or religion, (2) cultural competency training is available at the site, (3) the site considers ethnicity when assigning cases, (4) the site considers language when assigning cases, (5) the site has Hispanic staff, and (6) the site has American Indian staff. Only one of the six sites met each criterion within the scale. Lower scores were found to be significantly related to recidivism after controlling for a variety of other factors, including offender risk within the regression models; however, the bivariate relationships were not significant. As such, this scale may not be adequately measuring the construct of cultural competency within supervision.

While the research testing specific responsivity characteristics may be limited, the recognition of its application is growing as seen by the development of gender-based curriculum and programming and risk assessments for female offenders to target and address needs related to the pathways of criminal behavior, as well as trauma and victimization. Further, programming and interventions for offenders diagnosed with particular mental health issues or for those recognized as having severe and persistent mental illness are becoming of particular importance given the costs associated with these particular groups especially when there various needs involve a variety of professionals to address their mental health needs as well as their criminality (Swanson, Swartz, Van Dorn, Elbogen, Wagner, Rosenheck, 2006; McNeil and Binder, 2007).

Collectively, the general and specific components within the responsivity principle have empirical support and direct correctional practitioners toward not only matching the individual needs of the offender to the treatment and intervention, but also provide clear evidence that in order to change antisocial behavior and attitudes, cognitive behavioral approaches are most effective at reducing recidivism. The final section of this chapter discusses the fidelity principle.

The Relevance of the Fidelity Principle

The fidelity principle indicates that the most effective programs and correctional interventions are implemented as designed and adhere to the risk, needs and responsivity principles. Recently, research has begun to examine the impact of maintaining fidelity to the program model more closely, although there are earlier studies which have clearly established the importance of implementation, program characteristics, and effectiveness (Quay, 1977; Antonowicz and Ross, 1994).

Fixsen, Naoom, Blasé, Friedman, and Wallace (2005) authored a comprehensive summary of implementation research which is fundamental in understanding how effective programs are developed and later replicated. These researchers describe that there are six stages of implementation: (1) exploration and adoption, (2) program installation, (3) initial implementation, (4) fully operational, (5) innovation, and (6) sustainability. Initial implementation and being fully operational can take a program from two to four years to complete these steps. Fully operational programs have staff who are trained on the program model and curriculum, a full description of the program model (e.g., logic model), a data collection and reporting process, caseload sizes being met, all groups and activities running consistently, a developed supervision process, and internal quality assurance mechanisms in place. It is at this point, and prior to the innovation stage, in which outcome evaluations can be conducted. Further, Fixsen et al., (2005) and Bechtel (2011) note the importance of staff support in making modifications to an already existing program. All of these characteristics take a considerable amount of time and effort in order to implement a program or intervention successfully and to maintain program integrity.

Gendreau, Goggin, and Smith (1999) identified 32 guidelines for the successful implementation of correctional interventions categorized into organizational factors, program factors, staffing and change agent activities. Andrews (2006) noted that program implementation and adherence to the risk, need, and responsivity principles is often a challenge within corrections. In order for staff to adhere to the program model, there should be sufficient modeling, reinforcement, and monitoring (Andrews, 2006).

Program integrity is an essential component to program effectiveness. Andrews and Dowden (1999) found that the following seven program characteristics to be the most effective in their meta-analysis: (1) specified model (e.g., cognitive behavioral, social learning), (2) trained workers, (3) supervised workers, (4) printed curriculum manuals, (5) monitor change, (6) provide adequate dosage, and (7) work with an external researcher. Recidivism decreased anywhere from 20 percent to 45 percent based on what program characteristic was present. Based on this information, effective programs have internal and external quality assurance processes, assess offenders and measure behavioral change and recidivism, and participate in program evaluation with external researchers (Andrews and Dowden, 1999). Related to the involvement of external researchers, Lipsey (2001, 2009) found in both meta-analyses that the participation of an external researcher is directly related to program effectiveness.

Staff trained on the program model is a vital component to program integrity and effectiveness. While many programs will select programs that are reported to be evidence-based, this does not necessarily mean that staff are trained on these models or even support them. Increased recidivism reductions have been noted when program models are closely followed, which suggests that staff have been properly trained on these models. Specifically, Barnoski (2004) found that with two cognitive programs known for their effectiveness with juveniles,

Functional Family Therapy and Aggression Replacement Training, that these models actually increased recidivism rates by 10 percent to 17 percent respectively when the models were not followed.

Related to staff training and program delivery, Dowden and Andrews (2004) conducted a meta-analysis which examined the use of core correctional practices on recidivism. Correctional programs which followed the risk, need, and responsivity principles and had staff who were proficient in the use of core correctional practice techniques were found to be effective. In particular, skills such as, effective reinforcement, problem solving, structured learning, effective modeling, effective disapproval and use of authority were found to be significant. In addition to the Dowden and Andrews (2004) meta-analysis which focused on correctional programming and staff training and the use of core correctional practices, Bonta, J., Bourgon, G., Rugge, T., Scott, T., Yessine, A., Gutierrez, L., Li, J. (2010) saw similar results suggesting there is a relationship between service delivery, the use of core correctional practices and the effectiveness of supervision. Within the Bonta et al., (2010) study, offenders who were assigned to the trained officers experienced lower failure rates than the comparison group. Robinson, VanBenschoten, Alexander, and Lowenkamp (2011) used random assignment to examine the effectiveness of supervision techniques among federal probation officers trained on core correctional practices. Failure rates were nine percent higher for clients on the untrained officers' caseloads thereby suggesting the importance of training staff. Researchers also observed increased proficiency in the use of these skills especially when identifying opportunities to use certain techniques, such as, effective use of approval. Given that Gendreau and Ross (1987) found that ineffective programs were observed when there was a lack of therapeutic integrity, these meta-analyses and

individual study provide clear evidence that staff trained on core correctional practice techniques can improve program and supervision effectiveness.

Standardized program evaluation instruments, such as the Correctional Program Assessment Inventory (CPAI) examine the adherence of programs to the risk, need, responsivity, and fidelity principles (Gendreau and Andrews, 1989, 2002, 2010). The CPAI has been recommended to examine how effectively programs are implementing the risk, need, and responsivity principles (Gendreau, 1999). Such a recommendation is not surprising given that this program evaluation instrument has been empirically found to be significantly related to recidivism (French and Gendreau, 2006; Lowenkamp, 2004; Nevosic, 2004).

In a study examining 38 Ohio community-based residential programs, Lowenkamp, Latessa, and Smith (2006) evaluated the relationship between treatment integrity and program effectiveness. Programs which received satisfactory ratings indicating their effectiveness in implementing programs which adhere to the principles of effective interventions had lower recidivism rates.

Overall, the fidelity principle suggests that effective programs not only adhere to the risk, need, and responsivity principles, but also provide quality assurance processes to evaluate the implementation of the program model and monitor staff training, service delivery, and offender outcomes. Such programs have been found to be the most effective in not just implementing and delivering the program model and interventions, but also in reducing recidivism (Andrews, 2006; Antonowicz and Ross, 1994, Quay, 1977).

Summary

The paradigm shift in moving from 'nothing works' to reaffirming rehabilitation has been an extensive one. A plethora of empirical evidence has been offered which define and demonstrate the importance of the principles of effective intervention in changing offender behavior and reducing recidivism. It is the combination of these principles that has been shown to have the most significant impact on offender success. In particular, Andrews and Bonta (2006) observed in their meta-analysis of 374 studies that effect sizes increased with application of these principles. In particular, for studies that did not adhere to any principle, an increase in recidivism was observed regardless of the program being implemented within an institutional setting or in the community. However, recidivism reductions were observed when programming increased the number of principles of effective intervention were implemented. Specifically, programs which adhered to one principle saw up to a two percent reduction in recidivism. When two principles were adopted, up to a sixteen percent reduction was noted. Finally, for programs which implemented the risk, need, and responsivity principles, up to a 26 percent reduction was observed. Therefore, a cumulative impact occurs within programs that have fully embraced the principles of effective intervention.

The next chapter of this dissertation discusses the methodology and analytical strategy for the current study which intends to explore the topics of dosage, role playing and modeling, and group targets as it relates to risk, in order to provide practitioners with additional specific information for defining and implementing evidence-based programs.

CHAPTER THREE

METHODOLOGY

Introduction

Chapter three provides a full description of the methodological framework that will be followed to address the research questions for the proposed study. This chapter is divided into the following sections (1) research questions, (2) description of study sites, (3) study design, (4) measures, (5) data collection process, and (6) analytical strategy.

Research Questions

Chapters one and two discussed that there is a growing need within corrections to safely manage and treat moderate to high risk offenders. Nearly forty years of research has demonstrated that by adhering to the principles of effective intervention, recidivism reductions can be realized for the moderate to high risk groups. Further, the literature has repeatedly expounded upon the negative impact for low risk offenders to be given the same level of supervision and services as the higher risk population. There is preliminary empirical evidence related to increasing the intensity and dosage of treatment for the moderate and higher risk offender in order to achieve reductions in recidivism. However, the concepts of dosage and programming intensity and how each are defined and measured requires further exploration and refinement.

In addition to this, multiple studies have provided support for the need principle. Programs and interventions that target multiple criminogenic needs result in greater recidivism reductions than those that fail to address these dynamic risk factors or are primarily targeting

non-criminogenic needs. Empirical support for the "Big Four" indicates that antisocial behavior, attitudes, personality and peers are the primary dynamic risk factors to target for higher risk offenders. In practice, targeting antisocial attitudes, personality, and peers is rather challenging as change is difficult to measure. When programs focus on substance abuse or employment, there are objective measures available to assess change for these criminogenic needs. For example, an offender is hired and this information can be verified with the new employer or tests can be administered to identify illegal substances. Further, the amount of time focused on targeting these criminogenic needs within group settings remains uncertain. This study proposes to elucidate on these issues and examine if there are specific or combinations of criminogenic needs and a certain amount of programming dosage to reduce recidivism based on the risk level of the offender.

The research questions to be examined are stated below.

1. Based on the three risk levels (low, moderate and high), what dosage of treatment is appropriate for these groups to reduce their risk of recidivism?

2. Based on the three risk levels, what percentage of group time should focus on modeling and role playing, to reduce the risk of recidivism?

3. Based on the three risk levels, what percentage of group targets (i.e., criminogenic needs) are associated with reductions in recidivism?

4. Based on the three risk levels, what combination of group targets is associated with a reduction in recidivism?

Description of Study Sites

As indicated in Chapter one, data for this study are secondary in nature and were collected as part of a larger study evaluating the effectiveness of the Pennsylvania Department of Corrections 54 halfway houses and community-based correctional facilities (CCF). The study sites included in the current study focus on the 41 community-based correctional facilities that operate treatment programs for paroled populations in Pennsylvania under contract with the Department of Corrections. Most of the community based correctional centers (CCCs) did not provide programming, so these sites had to be excluded from the current study, which is why the study site sample size was reduced to 41. Table 1 provides the current study sample size, both for the treatment and comparison groups. Offenders in both the treatment and comparison groups are parolees under the jurisdiction of the Pennsylvania Department of Corrections. As shown in Table 1, the original treatment and comparison group sample sizes were comprised of 3,281 offenders each. Overall, the total sample size for the current study is 6,562 cases. To answer the research questions proposed in this dissertation, the focus will primarily be on the treatment group, as these offenders participated in programming within the community based correctional facilities. However, information about the comparison group will be reported to demonstrate the differences in recidivism rates by risk level between the two groups.

Program total sample sizes ranged from 3 to 229 offenders. These smaller program sample sizes are a noted limitation and throughout the analysis smaller programs will be either combined into a smaller program category or excluded. This will allow for a fairly rigorous analysis and should yield reliable findings that can be generalized to the target parole population in Pennsylvania served within the community-based correctional facilities and paroled to the streets.

Table 1. Programs and Sample Size

Program	Treatment	Comparison	Total
ADAPPT- Alcohol	41	41	82
ADAPPT- Group Home	229	229	458
Alle-Kiski Pavilion	148	148	296
Atkins House	12	12	24
Capitol Pavilion & Cone. Harris.	155	155	310
Conewago Place	111	111	222
Conewago Wern. Alcohol	29	29	58
Conewago Wern. Group	110	110	220
Conewago Wern. Penncapp	82	82	164
DRC (Alcohol)	6	6	12
DRC (Group Home)	55	55	110
DRC (Dual Diagnosis)	25	25	50
Eagleville D&A	55	55	110
Gateway-Braddock	80	80	190
Gateway-Erie	69	69	138
Gaudenzia-Common Ground	16	16	32
Gaudenzia-Concept 90	13	13	26
Gaudenzia-Erie	65	65	130
Gaudenzia First	5	5	10
Gaudenzia Philly House	33	33	66
Gaudenzia Siena Alcohol	67	67	134
Gaudenzia Siena Group	121	121	242
Gaudenzia West Chester	27	27	54
Hannah House	26	26	52
Joseph Coleman- Harmony	124	124	248
Joseph Coleman- Serenity	3	3	6
Joseph Coleman Tranquility	69	69	138
Keenan House/TT	63	63	126
Kintock-Erie Avenue	186	186	372
Liberty Management	80	80	160
Luzerne	48	48	196
Minsec Broad Street	65	65	130
Minsec Chester	119	119	238
Minsec Of Scranton	128	128	256
Minsec York Street	47	47	94
Penn Pavilion	98	98	196
Renewal, Inc.	214	214	428
Scranton Catholic	44	44	88
Self Help Movement	38	38	76
Transitional Living Center	20	20	40
Youthbuild/Crispus Attucks	9	9	18

Chart 1 below provides the site's capacity, successful termination rate as well as the services offered within each program. This chart represents site locations, not necessarily individual programs, so the total number of sites listed is 33. To clarify how this should be interpreted and reconcile the information between Chart 1 and Table 1, when examining Chart 1, the Diagnostic and Rehabilitation Center (DRC) is listed once. However, within Table 1 above, DRC is listed three times since this site location runs three programs. Therefore, some site locations operated more than one program. The current study will be focused on the individuals from each program rather than combining the treatment group offenders into one site location.

The average successful termination rates for the CCF programs were 81% and the range was from 36% to 100% successful discharge rates. Sixteen of the 33 CCF program sites served both males and females, 14 served males only and 3 programs served only females. Further, eight of the 33 CCF program sites (24%) did not offer substance abuse programming. Thirty of the 33 CCF program sites (91%) had employment services. Services for targeting mental health issues, dual diagnosis and sex offending, were not consistently offered across the programs. Anger and domestic violence are provided in nearly half of the program sites. Fifteen programs offered cognitive restructuring and skills building.

Chart 1. Program Services, Capacity, and Facility Type

Program Name	Capacity	Successful Termination Rate	Serves Males/Females	Substance Abuse	Employment	Mental health services	Dually-diagnosed	Sex Offender	Anger/Domestic Violence	PennCAPP	Cognitive restructuring	Skill Building
ADAPPT	178	65	M&F	X	X				X		X	
Alle-Kiski Pavilion	75	87	M	X	X							
Atkins House	15	75	F	X	X				X		X	
Capitol Pavilion & Conewago Harrisburg	96	87	M&F									
Conewago Place	55	97	M&F	X	X				X		X	
Conewago Wernersville	250	88	M&F	X	X				X	X	X	
Diagnostic and Rehabilitation Center	148	64	M&F	X	X		X	X	X			
Eagleville D&A	40	82	M	X	X				X		X	

Gateway Braddock	90	83	M&F	X					X		X	
Gateway Erie	35	88	M&F	X	X				X		X	X
Gaudenzia Common Ground	6	100	M&F	X								
Gaudenzia Concept 90	42	92	M&F	X								
Gaudenzia Erie	55	83	M&F	X								
Gaudenzia First	22	36	M&F	X		X						
Gaudenzia Philly House	36	76	M		X							
Gaudenzia Siena House	99	78	M	X	X				X			X
Gaudenzia West Chester	22	100	M&F	X								
Hannah House	27	79	F		X							
Joseph Coleman	260	83	M	X	X	X			X	X	X	
Keenan House	85	78	M&F	X	X				X		X	X
Kintock Erie Avenue	280	75	M&F	X	X				X		X	
Liberty Management	100	73	M		X							
Luzerne	55	67	M	X	X							
Minsec Broad	112	76	M	X	X				X			
Minsec Chester	90	89	M		X							
Minsec Scranton	58	88	M	X	X				X			X

Minsec York Street	75	78	M	X	X				X			
Penn Pavilion	75	85	M	X	X							
Renewal, Inc.	192	86	M&F	X						X	X	
Scranton Catholic Social Services	15	94	M&F		X							
Self Help Movement	70	86	M	X	X				X			
Transitional Living Center	34	40	F		X							X
Youthbuild Crispus Attucks	20	100	M		X							

Study Design

As mentioned previously, the focus and analysis for the current study will be on the treatment group as described in the original Pennsylvania evaluation study. Information below is presented on the demographics and recidivism rates for the offenders in the CCF programs (original study treatment group) and offenders on parole (original study comparison group). This information on the original study comparison group is provided since the recidivism rates were found to be significantly lower than the treatment group. Having this reference will be beneficial in evaluating if the recidivism rates experienced by the treatment group from the original evaluation were lower when examining the research questions related to dosage, targeting criminogenic needs, role playing and modeling, and the use of core correctional practices. Within the original evaluation of these data, propensity score matching was used to match treatment and comparison group members based on sex, race, committing county, sex offender status and Level of Service Inventory (LSI-R) scores. Tables 2 and 3a present the demographics and risk levels for the treatment and comparison groups. When examining these two tables below, several measures reveal statistically significant differences between groups, including marital status, age, years in the institution, offense seriousness, and being employed six months prior to incarceration. There were very few differences observed between the treatment and comparison cases with respect to the LSI-R score, risk level, sex, race, education level, and sex offender status. Tables 2 and 3a present the demographics and risk levels for the treatment and comparison groups. Table 3b presents the recidivism rates by risk level comparing the two groups. As was observed in the original study, the recidivism rates are highest for the treatment group overall and by risk level.

Table 2. Descriptive Statistics- Demographic Variables

Variable	Comparison Group		Treatment Group	
	N	%	N	%
Sex				
Male	3061	93.3	3061	93.3
Female	220	6.7	220	6.7
Race				
Non-white	1834	55.9	1834	55.9
White	1447	44.1	1447	44.1
Marital Status[a]				
Not Married	2750	83.8	2832	86.3
Married	531	16.2	449	13.7
Education Level[b]				
Less than High School	1188	40.3	1217	44.8
High School or above	1981	59.7	1833	55.2
Employed six months prior[c]				
Employed	2371	72.3	2571	78.4
Unemployed	910	27.7	710	21.6
	Mean	S.D.	Mean	S.D.
Age*	33.3	10.0	36.0	9.6
Years in the Institution*	3.53	4.1	6.61	5.4

[a] Pearson $x^2 = 8.066$, $p = .005$

[b] Pearson $x^2 = 3.817$, $p = .051$

[c] Pearson $x^2 = 32.785$, $p = .000$

*$p \leq .001$

Table 3a. Descriptive Statistics- Offense Severity and LSI-R data

Variable	Comparison Group		Treatment Group	
	N	%	N	%
Current Offense Seriousness[a]				
Low	35	16.3	311	9.5
Medium	2427	74.0	2397	73.1
High	319	9.7	573	17.5
Sex Offender				
No	3248	99.0	3248	99.0
Yes	33	1.0	33	1.0
LSI-R Risk Level				
Low (0-20)	864	26.3	864	26.3
Moderate (21-28)	1409	42.9	1409	42.9
High (29-54)	1008	30.7	1008	30.7
	Mean	S.D.	Mean	S.D.
Total LSI-R Score	25.0	6.9	25.0	7.5

[a] Pearson $x^2 = 131.824$, p = .000

Table 3b. Recidivism Rates by Group and Risk Level

Recidivism & Risk Level	Comparison Group (N=3281)		Treatment Group (N=3281)	
	N	%	N	%
Technical Violation[a]				
Low	158	15.3	313	36.2
Moderate	463	32.9	703	49.9
High	381	37.8	568	56.3
Arrest[b]				
Low	135	15.6	179	20.7
Moderate	342	24.3	428	30.4
High	291	28.9	346	34.3
Incarceration[c]				
Low	160	18.5	316	36.6
Moderate	476	33.8	717	50.9
High	389	38.6	576	57.1
Any Recidivism[d]				
Low	206	23.8	362	41.9
Moderate	553	39.2	814	57.8
High	457	45.3	639	63.4

[a] Pearson x^2=216.176, p=.000

[b] Pearson x^2=26.957, p=.000

[c] Pearson x^2=216.309, p=.000

[d] Pearson x^2=219.992, p=.000

Measures

The following section describes the offender level data and the program level data for the current study. Offender level data contained the necessary unique identifiers to link offender level data across data files including demographics, LSI-R risk level, offense information, parole supervision status, and recidivism data to the correct offender. Program level data were comprised of all measures from the Evidence-Based Correctional Program Checklist (CPC) the Correctional Program Assessment Inventory – 2000 (CPAI-2000), and the PADOC program data described below.

Offender Data

Offender data were provided directly from the Pennsylvania Department of Corrections (PADOC) and were originally used to conduct the statewide program evaluation of all community based correctional facilities within Pennsylvania. The method of data transfer was a secured electronic process from the PADOC to the co-principal investigator at the University of Cincinnati. Specifically, the PADOC provided offender identifying information for matching purposes, demographics, risk and behavior indicators, offense information, institutional and community supervision information, and recidivism.[4] Variables within these categories included:

- *Identifying Information:* Offender name, date of birth, Social Security number
- *Demographics:* Sex, race, age at release, highest level of education, marital status, employment status

[4] Recidivism measures are presented in the "Outcome data" section.

- *Risk and behavior indicators:* Total score and risk level for the Level of Service Inventory-Revised (LSI-R) risk and needs assessment, prevalence for alcohol and drug use and assaultive behaviors[5]

- *Offense information:* Offense type, sexual offense, offense severity and offense seriousness level

- *Institutional and community supervision:* Adjustment to the institution, time spent in prison, community correctional facility assignment, supervision level, program discharge, parole discharge status

Measures within the individual database included all of the offender variables identified above. Site identification numbers were provided in the database and each number directly corresponded to the program. Since a few sites had more than one program, there was recoding for a few site identification numbers in order to properly match the individual level and program data.

Program Data

Program data were obtained from a variety of sources including the data collection instruments that were developed to conduct the initial statewide program evaluation for the community-based correctional facilities within Pennsylvania, the Evidence-based Correctional Program Checklist (CPC), and the Correctional Program Assessment Inventory- 2000 group observation form (CPAI-2000). Each of these sources will be described below and information specific to program data used in this study will be provided.

[5] LSI-R categories for the PADOC are: Low 0-20, Medium 21-28, High 29-54.

Multiple data collection instruments were developed for the statewide evaluation. Interview forms for program directors, staff, and program participants were constructed as well as surveys for all staff levels and program participants. The program director and staff interview forms collected much of the same information related to: (1) staff characteristics, (2) offender assessment, (3) treatment characteristics, and (4) quality assurance. There are a few distinctions between the program director and staff interview guides. In particular, the program director interview form also contains information related to program leadership, staff characteristics for hiring, and initial program development. Data collection tools were created to consistently review the contents of program curricula and treatment files. Finally, a summary document was established which synthesized all of the various data collection instruments. The information contained in the summary document was entered into a program summary database.

As described in Chapter two, dosage has been measured in increments of 50 to 100 hours and previous research recommends counting dosage for primarily cognitive behavioral programming and interventions (Bourgon and Armstrong, 2005; Sperber et al., 2013, 2014; Makarios et al., 2014). Unique to this study is measuring the dosage by calculating the average percentage of time modeling and role playing within treatment groups, average length of time in the program measured in months and the total number of hours a group meets. This program summary database captured the following information as it relates to dosage, modeling, role playing, and targets for treatment:

<u>Dosage</u>

1. Average length of time in the program measured in months

2. The percentage of time role playing is used in the treatment groups
3. The percentage of time modeling is used in the treatment groups
4. The number of group sessions hours per week

Modeling and Role Playing[6]

1. Identifies if the program teaches skills to assist in following a prosocial lifestyle
2. Identifies if the group facilitator models new behaviors and skills for participants
3. Identifies if the program is teaching offenders to plan or rehearse alternatives to antisocial or problem situations

Treatment Targets

Program directors and staff were asked during the on-site visits about the primary treatment targets for the program. While all treatment targets were recorded, the majority were categorized within one of the 28 treatment targets listed below. The following list of treatment targets includes:

1. attitudes, orientations and values favorable to law violations
2. antisocial peer associations
3. problems associated with alcohol/drug abuse
4. anger/hostility level
5. skills of lying, stealing, and aggression
6. self-control, self-management, and problem solving skills
7. constructive use of leisure time
8. skills in interpersonal conflict resolution

[6] These items are dichotomously measured to indicate that modeling and role playing did or did not occur.

9. vocational achievement
10. educational achievement
11. economic/social needs
12. family affection/communication
13. family problem solving
14. offender relationship with children
15. parenting skills
16. offender relationship with significant other
17. deviant sexual arousal/attitudes/behavior
18. relapse prevention
19. harm done to victim
20. low self-esteem
21. mental health issues
22. physical health issues
23. childhood abuse/neglect issues (offender victimization)
24. trauma/PTSD
25. cognitive delay
26. literacy problems
27. race/ethnicity issues
28. client motivation

Since these 28 measures above are not all criminogenic needs, a dichotomous variable will be created that indicates if a treatment target is a criminogenic need or a non-criminogenic need, coded as 0 = not a criminogenic need and 1 = criminogenic need. This binary measure

indicates if a treatment target is a criminogenic need or not, and will be used to response to research question three. Treatment targets one through nineteen will be identified as criminogenic needs and targets twenty through twenty-eight will be identified as non-criminogenic needs or responsivity factors.

The Evidence Based Correctional Program Checklist (CPC)

The CPC is an objective and validated assessment program evaluation tool used to measure adherence to the four primary principles of effective intervention. There are two sections to the CPC, program content and program capacity. Program capacity evaluates three areas: (1) program leadership and development, (2) staff characteristics and (3) quality assurance. Program content evaluates offender assessment practices and treatment characteristics. This instrument was used to score out each program across Pennsylvania. Measures from the CPC used for this study will be identified following a description of the tool.

Within program capacity, program leadership and development evaluates the educational and professional experiences of the program director. In addition, items in this domain examine the level of involvement of the program director related to the developing of the program and serving in just an administrative capacity or having a caseload or facilitating groups. There are measures that examine issues related to implementation and sustainability, such as funding and piloting groups and new interventions before the program is considered fully operational. Within the staff characteristics section, educational and professional experiences are considered along with measuring staff support and general cultural support of rehabilitation and the program model. This section further examines if clinical supervision is regularly provided and if there are trainings available that increase the professional development and skills of staff. Finally, quality assurance focuses on identifying what strategies are followed to maintain the treatment model,

evaluate case management and group facilitation, examine offender progress, establish and follow a routine records maintenance review, and to conduct process and outcome evaluations.

Program content focuses on the use of offender assessment and identifying specific treatment characteristics. The section on offender assessment practices determines if the program has implemented and is properly using an actuarial, standardized risk and needs assessment. Further, the assessment is to be validated on the program participants. The identification and following of a program's exclusionary criteria are also measured by the CPC. The items under the treatment characteristics domain evaluate if the targets for intervention focus primarily upon criminogenic needs and if the program model follows social learning and/or cognitive behavioral theories. Related to responsivity, the CPC evaluates if specific responsivity factors are identified and addressed for participants in addition to the process for matching staff to the program. Further, there are items that consider the dosage of the program being appropriate based on participant risk level, the use of rewards and consequences, consistent supervision of groups, and program completion rates.

Each domain on the CPC results in a score for that section. In addition, a score and rating is provided for program content and capacity individually and then an overall score and rating is calculated for each program. Highly effective programs have a score of 65% or over and effective programs have scores that range between 55% to 64%. Programs that are identified as needing improvement earn scores of 46% to 54% and ineffective programs result in a score of 45% or less.

Measures taken from the CPC for the current study include:[7]

1. Identifying if at least 50 percent of the programs targets are criminogenic
2. Identifies if the group facilitator models new behaviors and skills for participants
3. Identifies if the program is teaching offenders to plan or rehearse alternatives to problem situations.
4. Total score on the CPC

The Correctional Program Assessment Inventory- 2000 (CPAI-2000)

As previously mentioned, the CPAI-2000 group observation form was used in the observations of all treatment groups. This form examines the use of core correctional practices as observed in the therapeutic relationship between a staff member, generally the group facilitator, and a program participant. The core correctional practice techniques examined on this form are: (1) anti-criminal modeling, (2) effective reinforcement, (3) effective disapproval, (4) problem-solving techniques, (5) structured learning procedures for skill building, (6) effective use of authority, (7) elements of cognitive restructuring, (8) relationship practices, (9) structuring skills, and (10) motivational interviewing (Andrews and Bonta, 2003).[8]

Steps within each technique are scored as 'yes' or 'no' indicating that the step was observed or not. Further, items can be identified as 'not applicable' or 'no opportunity to observe.' When completing the scoring of the group form, confidence ratings are included for

[7] Some of the same measures can be found on the CPC as well as within the program summary database. Both sources of information will be examined.

[8] For additional discussion on core correctional practices, please see Andrews and Bonta (2003), *The Psychology of Criminal Conduct*, which discusses core correctional practices, the relationship principle discussed from PIC-R and presents meta-analytic findings related to the elements of core correctional practice. Permission to use the CPAI-2000 group observation form was provided directly by the developer, Paul Gendreau.

each item which are a five point ordinal scale in which a five suggests that the rater is highly confident with the 'yes' or 'no.' A three suggests moderate confidence and a rating of one suggests a lack of confidence in the rating of 'yes' or 'no.'

Each of these core correctional practice skills with confidence ratings of three and above will be examined for the second research question. A description of the steps being observed for each core correctional practice skill follows along with the total points possible for each section. Anti-criminal modeling, worth a total of four points, focuses on a coping model being used, that the preferred model is clearly displayed with steps, and the model serves as a source of reinforcement. Effective reinforcement items address that rewards or reinforcers are offered promptly after the prosocial behavior is displayed and with greater emphasis, that reasons are provided for why that behavior is being reinforced, and that the offender is provided with an opportunity to consider the short and long term benefits for continuing the prosocial behavior. Effective reinforcement is worth a total of four points. Effective disapproval steps include that the behavior or speech is promptly disapproved of, that a reason why the behavior or speech is unacceptable is offered, that anti-criminal modeling is provided, that the offender be presented with an opportunity to consider the short and long term consequences for continuing the antisocial behavior, and that when the behavior ceases, the disapproval also ceases and the new prosocial alternative is subsequently praised. Effective disapproval is worth four points. Problem solving includes six steps (and is worth six points) which target identifying the problem and clarifying goals, identifying alternative solutions and evaluating these options, implementing the plan and then evaluating the plan. Items from structured learning procedures for skills building, worth a total of six points, focus on defining the skill, modeling the skill, providing an opportunity to have offenders practice or role play the skills and finally having the staff member

provide feedback to the offender based on their demonstration of the skill. Effective use of authority steps integrate addressing the behavior, rather than the individual, in a specific, clear, and calm manner, while offering what the attendant consequences will be if the offender continues to display antisocial behavior or if the offender selects a prosocial alternative. The CPAI-2000 group observation tool also identifies if staff are using encouraging messages to motivate offenders toward compliance rather than only monitoring offender behavior for non-compliance. Effective use of authority is worth a total of ten points. Elements of cognitive restructuring, or cognitive self change worth a total of five points, involves working with the offender to identify problem situations and antisocial thinking and then introducing additional alternative practice opportunities to develop prosocial thinking. Relationship practice skills describe if the staff member is open, empathic, uses respectful communication, and is optimistic when interacting with offenders. Relationship practices are worth a total of four points. Structuring skills is a one step technique, worth one point, that specifies if the skills presented by staff are structured, solution-focused and directive. The final core correctional practices skill, motivational interviewing, worth a total of two points, indicates if the staff member is able to calmly avoid engaging in arguments when challenging behaviors and attitudes emerge, and the staff member actively promotes offender self efficacy. Collectively, the total number of 'yes' responses or points possible on the CPAI-2000, is 45.

There were a total of 78 observations conducted, but not all observations resulted in confidence ratings of three and above for each section of the CPAI-2000. To address this and respond to research question two, the individual core correctional practice skills will be examined when the group observation form indicates confidence ratings for each step within a skill were consistently rated at three and above and there were no missing data for any step or

section score. There were a total of 29 group observations identified where each step had confidence ratings of 3 and above and there were no missing scores for any step. It should be noted that of these 29 observations, there were no items marked 'no opportunity to observe'. No program earned all 45 points possible on the CPAI-2000, and the points ranged from a minimum of 7 to a maximum of 30. The average number of points earned was 20 points or 44%.

Outcome Data

There were three measures of recidivism that were provided by the PADOC. Recidivism was dichotomously measured as the event occurring or not. These original outcome measures include: technical violations, number of arrests, and re-incarceration. The number of arrests was recoded into a dichotomous outcome variable. Further, an overall recidivism measure was created, so for any case where at least one measure of recidivism occurred, the overall measure of recidivism variable, labeled as 'any recidivism' was then coded as a '1' indicating that the offender had recidivated.

Data Collection Process

There are 54 community correctional facility sites in Pennsylvania. However, only the 41 contracted facilities conducted programming.[9] Therefore, these 41 programs will comprise the program sample for this study. As previously discussed, data collection included site visits with interviews of staff and participants, group observations, and file and curriculum reviews. As mentioned above, there were a total of 78 group observations that were made at each program using the CPAI-2000 group observation form. Site visits and program data collection began in early August 2006 and concluded at the end of December 2006. Site visits to Pennsylvania

[9] A statewide review of all CCC and CCF programs was completed by the University of Cincinnati and the same 41 contracted programs were reviewed as part of that evaluation.

community correctional facility programs were conducted weekly and generally lasted one day on site. In addition to the information collected on site, there were follow-up phone calls and emails that occurred with a number of programs to collect additional data that were not gathered at the time of the original site visit.

All data from the program summary form and the CPAI-2000 were entered into separate databases. While the program summary form contained over 900 variables, it had all items from the Evidence-Based Correctional Program Checklist (CPC). The variables from the CPC were used to rate how well the program overall implemented the risk, need, responsivity and fidelity principles.

The program summary database was developed in order to quantitatively document all of the relevant program characteristics including: program history and development; financial support and sustainability; program staff professional and educational characteristics, training opportunities and staff and community support for the program; groups offered and the primary targets and activities for each group. Ancillary databases that incorporated other activities completed during the site visits were also created. These additional activities included: interviews of program staff and program participants, file review forms, and surveys of program staff. While the CPC does provide data to be used to answer the research questions, the program summary database and these ancillary files will also be examined as these contain measures specific to dosage, program targets related to criminogenic and non-criminogenic needs, and the use of modeling and role playing within program groups.

Analytical Strategy

This section will provide information related to (1) assumptions made to complete this evaluation and (2) the specific statistical analysis that will be conducted to examine the four research questions proposed in this study.

Assumptions

In order to evaluate the impact of dosage, core correctional practices including modeling and role playing, and the targeting of criminogenic needs on the three risk levels of offenders in this sample, there are several assumptions that need to be made based on the methodology employed and the available data obtained from the CPC and the CPAI-2000. First, specific program dosage is calculated the same for all offenders assigned to that respective program, regardless of risk level. This was done because no programs reported separating offenders by risk level. Second, modeling and role playing did not occur within each program and time spent on role playing and modeling was collected during interviews only although group observation served as an indicator that these techniques were implemented. Time spent on these skills however is assumed to be uniform across all participants in each respective program. Third, similar to the use of core correctional practice skills including modeling and role playing, the actual criminogenic needs targeted in each program are assumed to be uniform across participants. While these assumptions are necessary to address the research questions, there were no mechanisms that would allow for these issues to be definitively true for each offender.

Related to members of the comparison group, no data were available that indicated if the parolee was participating in any programming while on supervision. Therefore, data from the comparison group will be used to only report recidivism rates by risk level. Given the vast

amount of research related to the risk principle suggesting that programming should target the higher risk offenders and should avoid mixing treatment and programming by risk levels, this analysis will be meaningful to report recidivism rates especially for the lower risk offender in the comparison group who are assumed to have received no programming in the community correctional facility or community correction center.

Statistical Analysis

To address the four research questions proposed for this study, univariate, bivariate and multivariate statistics will be calculated. The discussion below provides a summary of the analytical plan.

First, descriptive statistics including frequencies, means and standard deviations will be calculated to describe the demographic characteristics (sex, race, age at release, highest grade completed, employment status six months prior in the community, marital status, LSI-R score, and risk level) for both the treatment and comparison group.[10] While treatment and comparison cases were matched on: (1) race, (2) sex, (3) committing county, (4) LSI-R category,[11] and (5) sex offense, additional data will be presented that further describes concerns with alcohol and drug use, violent or assaultive behavior, and time in the institution. Finally, descriptive statistics will be reported on all outcome measures. In addition, crosstabulations, t-tests and Pearson chi-squares will be calculated to examine if there are significant differences between these characteristics across low, moderate, and high risk levels.

Second, the dosage of programming will be calculated for each program based on the average length of time spent in the program in months as well as the average length of time spent

[10] See Tables 2, 3a, 3b
[11] LSI-R categories for the PADOC are: Low 0-20, Medium 21-28, High 29-54.

in specific treatment groups. An overall average of total group time will be calculated for each program. Calculation of dosage for group participation will be measured by the total number of hours spent in group. To examine if there is a relationship between recidivism and dosage, bivariate correlations will be calculated examining the association between the average length of time spent in programming or groups and each of the four outcome measures. This bivariate analysis will also be conducted examining the relationship between dosage and recidivism for each risk level. In addition to identifying if there is a significant relationship between these measures, the direction of this relationship will be examined to see if increases in dosage indicate reductions in recidivism. Further, multivariate analyses will be conducted to identify if programming dosage is significantly related to recidivism. If appropriate, two interaction measures may be evaluated looking at risk level and dosage and then CPC total score and dosage. Each dosage measure will be examined in separate multivariate models and each measure of recidivism (technical violation, arrest, incarceration, and any recidivism). Logistic regression models will be conducted for the multivariate analyses as the dependent variables (recidivism measures) are all dichotomous. These analyses will be conducted on the individual level due to the assumptions made related to dosage being constant for offenders assigned to the respective program.

Third, an examination into the impact on using core correctional practices on program effectiveness and recidivism will be completed. In addition to this, the percentage of group time that is dedicated time spent in groups for modeling and role playing will be calculated. The same bivariate analysis described for dosage will occur to address this research question.

Fourth, treatment targets, criminogenic or non-criminogenic needs will be examined. Gendreau, French and Taylor (2002) found that multi-modal interventions that address four to

six criminogenic needs rather than non-criminogenic needs result in reductions in recidivism. As previously discussed, data on treatment targets is captured in the program summary and CPC databases. Each treatment target identified for a program will be categorized into criminogenic or non-criminogenic and then each category will be summed to determine the ratio of criminogenic to non-criminogenic needs. In addition, a dichotomous variable will be created that indicates if the program targets more criminogenic or non-criminogenic needs. Descriptive statistics, bivariate correlations and regression models will be calculated to determine the impact of treatment targets on recidivism.

The final research question will explore if there are combinations of criminogenic needs that when targeted by risk level have a greater impact on reducing recidivism. This analysis will only focus on offenders who participated in programming and will compare combinations of treatment targets by risk level to determine if there is a priority in what criminogenic needs should be addressed for moderate and high risk offenders. This analysis will include descriptive statistics and crosstabulations as well as multivariate regression models.

Summary

Each of the research questions proposed in this study attempt to address a current gap in the literature. Over three decades of research has confirmed the importance of the risk and need principles. There is recognition that low and high risk offender groups should not be mixed and there is a distinction of what risk factors are criminogenic needs and what factors are not crime-producing; however, treatment, programming, and interventions continue to vary in terms of their adherence to the risk and need principles. Social learning and cognitive behavioral theories have demonstrated that modeling, skills practice, and the effective use of approval and positive reinforcement will teach prosocial alternatives to offending populations. With these data and

proposed methodology and analysis, this study will provide some insight by risk level into programming dosage, percentage of group time to be used for modeling and role playing, the percentage of treatment targets, and what combination of criminogenic needs result in the greatest reductions in recidivism. The final two chapters of this dissertation present the findings and a discussion of the results.

CHAPTER FOUR

RESULTS

Chapter Four presents the findings for each of the four research questions posed in this dissertation including:

1. Based on the three risk levels (low, moderate and high), what dosage of treatment is appropriate for these groups to reduce their risk of recidivism?

2. Based on the three risk levels, what percentage of group time should focus on the use of core correctional practices, including modeling and role playing, to reduce the risk of recidivism?

3. Based on the three risk levels, what percentage of group targets (i.e., criminogenic needs) are associated with reductions in recidivism?

4. Based on the three risk levels, what combination of group targets is associated with a reduction in recidivism?

This chapter contains five sections and is organized by research question. Each section focuses on one research question and integrates multiple descriptive tables that lay out the various steps in preparation for the analysis to respond to each specific research question. A final summary section is offered at the conclusion of this chapter.

Research Question One

Research question one seeks to identify what dosage of treatment is appropriate to reduce recidivism by risk level. Dosage was measured as the average months in the program and total group hours. As defined in Chapter 3, the average months in the program and the total group

hours are shared or assumed to be a constant within a program, but vary across programs and by risk level. Further, the overall effectiveness of the program, based on the CPC, is likewise assumed to be constant for all offenders assigned to that program. Before responding to this research question, this section lays out the necessary descriptive information that will lead up to the final analysis conducted to respond to research question one. In particular, the multiple tables below provide crosstabulations describing rates of recidivism by risk level and by CPC program rating. Information pertaining to the dosage measures is also presented by risk level and by CPC program rating. This information is provided intentionally to offer the necessary content on program dosage and recidivism by risk level and CPC program rating. As described in Chapter 3, the analytical strategy followed to respond to this question will include presenting crosstabulations, and conducting both bivariate and multivariate analyses.

Descriptives and Bivariate Analysis

Dosage by LSI-R Risk Level

To begin, Table 4 describes the dosage measures by LSI-R risk level. As indicated, the mean value for average program months for all three risk levels was 4 months. The average group hours for low risk offenders was 108 hours, followed by 114 hours for moderate risk offenders, and 124 hours for high risk. One way analysis of variance (ANOVA) tests were conducted to examine the difference between means for total group hours both within and between programs and the findings revealed a statistically significant difference ($F=4.188$, $p\leq.001$). Statistically significant differences were also noted for the program length ($F=2.725$, $p\leq.001$).

Table 4. Range and Mean for Average Program Months and Group Hours by LSI-R Risk Level

LSI-R Risk Level	Minimum	Maximum	Mean	SD
Low – Program Months	1.5	12.0	4.0	2.2
Low – Group Hours	0	720.0	107.9	169.6
Moderate – Program Months	1.0	12.0	4.0	2.2
Moderate – Group Hours	0	720.0	114.4	177.8
High – Program Months	1.0	12.0	4.0	2.2
High – Group Hours	0	72.0	124.4	186.5

Recidivism by LSI-R Risk Level

Table 5 provides the recidivism rates (technical violation, arrest, incarceration, any recidivism) by LSI-R risk level. Within these four tables, the recidivism rates significantly increase with an increase in risk level. While not presented within a table, bivariate analyses indicated that the LSI-R total score was significantly correlated with each measure of recidivism at the $p \leq .001$ level: technical violation (r=.165), arrest (r=.118), incarceration (r=.167), and any recidivism (r=.172).

Table 5. LSI-R Risk Level and Recidivism Rates (N=3281)

LSI-R Risk Level	Technical Violations[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
	N	%	N	%	N	%	N	%
Low (N=864)	313	36.2	179	20.7	316	36.6	362	41.9
Moderate (N=1409)	703	49.9	428	30.4	717	50.9	814	57.8
High (N=1008)	568	56.3	346	34.3	576	57.1	639	63.4

[a]Pearson x^2 =78.021, p=.000, [b]Pearson x^2 =43.920, p=.000, [c]Pearson x^2=82.132, p=.000, [d]Pearson x^2=92.974, p=.000

Program CPC Ratings and Dosage

The next step was to provide descriptive information regarding dosage and program effectiveness based on the CPC. CPC effectiveness ratings are based on the percentage of total points earned. This rating scale corresponds with how well the program adheres to the principles of effective intervention. Highly effective programs have a score of 65% or over and effective programs have scores that range between 55% to 64%. Programs that are identified as needing

improvement earn scores of 46% to 54% and ineffective programs result in a score of 45% or less. Table 6a displays the CPC total score percentages[12] and overall CPC ratings for the programs. As depicted in Table 6a below, 26 programs were scored as ineffective programs, 12 programs were rated as needing improvement, and the remaining 3 programs were effective. In addition to this, Table 6a displays the average program months and total group hours. Recall that the programs did not vary dosage for any program participants. The total group hours was calculated based on the total number of hours for each group offered by program. It was expected that the total number of group hours may not always align with the average program months.

[12] Percentage values were rounded.

Table 6a. Program CPC Scores, Ratings, and Dosage

Program	CPC Total Score Percentage	CPC Rating	Average Program Months	Total Group Hours
1	37%	Ineffective	2	23
2	43%	Ineffective	2.5	0
3	50%	Needs Improvement	1.5	374
4	33%	Ineffective	6	5
5	35%	Ineffective	3	14
6	43%	Ineffective	1.5	21
7	42%	Ineffective	2	179
8	31%	Ineffective	3	240
9	40%	Ineffective	3	429
10	46%	Needs Improvement	1.5	72
11	52%	Needs Improvement	12	80
12	54%	Needs Improvement	6	33.25
13	36%	Ineffective	3	60
14	35%	Ineffective	3	14
15	57%	Effective	3	4
16	54%	Needs Improvement	1	19.75
17	49%	Needs Improvement	3	13
18	52%	Needs Improvement	1.5	14.25
19	41%	Ineffective	12	40
20	31%	Ineffective	6	0
21	43%	Ineffective	3	84.5
22	48%	Needs Improvement	3	0
23	41%	Ineffective	3	82
24	43%	Ineffective	6	0
25	44%	Ineffective	4.5	12
26	37%	Ineffective	8	0
27	50%	Needs Improvement	3	0
28	50%	Needs Improvement	3	198
29	54%	Needs Improvement	4.5	166.5
30	44%	Ineffective	5	8
31	38%	Ineffective	3	28
32	30%	Ineffective	5	0
33	29%	Ineffective	3	0
34	42%	Ineffective	4	720
35	30%	Ineffective	5	0
36	46%	Needs Improvement	1.5	374.5
37	61%	Effective	3	365
38	35%	Ineffective	4	0
39	36%	Ineffective	1.5	15.75
40	57%	Effective	4	46
41	27%	Ineffective	4.5	0

To summarize this information for ineffective, needs improvement, and effective programs, Table 6b presents the minimum and maximum values and mean for average program months and total group hours. As indicated, the mean value for average program months for ineffective programs was 4.3 months. Needs improvement programs had an average of 4 months, while effective programs, had an average of 3 months of programming. The average group hours for ineffective programs was 107 hours, followed by 114 hours for needs improvement programs, and 147 hours for effective programs. One way analysis of variance (ANOVA) tests were conducted to examine the difference between means for total group hours both within and between programs and the findings revealed a statistically significant difference ($F=170.827$, $p\leq.001$). Similar statistically significant results were found for program months ($F=135.001$, $p\leq.001$).

Table 6b. Range and Mean for Average Program Months and Group Hours by CPC Rating

CPC Rating	Minimum	Maximum	Mean	SD
Ineffective – Program Months	1.0	12.0	4.3	2.3
Ineffective – Total Group Hours	0	720.0	107.7	182.3
Needs Improve. – Prog.Months	1.5	8.0	4.0	2.2
Needs Improve. – Total Grp. Hr.	0	374.5	114.4	167.2
Effective – Program Months	1.5	5.0	2.9	.9
Effective – Total Group Hours	0	365.0	146.9	177.7

Dosage and Recidivism

Table 7 reveals the relationship between average program months and total group hours with the four measures of recidivism. Significant negative associations between average program months and the four measures of recidivism were noted, with all of these correlations being relatively weak (Cohen, 1988). This suggests that fewer average program months were associated with increases in recidivism. Stated differently, the longer program lengths were significantly associated with decreases in technical violations, incarceration, and any recidivism.

Positive and significant relationships for total group hours and technical violations, arrest, and any recidivism were found, but the relationship between total group hours and incarceration was not statistically significant. As such, for total group hours, increases in total group hours were significantly associated with increases in recidivism. Similar to average program months and recidivism, the correlations between total group hours and recidivism were relatively small (Cohen, 1988).

Table 7. Bivariate Correlations for Dosage and Recidivism (N=3281)

Recidivism	Average Program Months	Total Group Hours
Technical Violation	-.080*	.091*
Arrest	-.049	.094*
Incarceration	-.091*	.016
Any Recidivism	-.103*	.088*

*p≤.001

CPC Rating and Recidivism

Table 8 presents the recidivism rates by CPC Rating. Across the four recidivism measures, effective programs performed slightly better than programs rated as needing improvement or ineffective, but the differences observed were not significant. While the effective programs had a technical violation rate of 46%, this did not significantly differ from the 49% technical violation rate observed for ineffective programs. Arrest rates were lowest for effective programs at 26% and highest for needs improvement programs at 32%. Incarceration rates were lowest for effective programs at 47% but this did not significantly differ from the ineffective program rate of nearly 50%. Similar findings were revealed when examining any recidivism. Effective programs had a 53% recidivism rate in comparison to ineffective programs which had a 56% recidivism rate. While not presented in a tabular format, Pearson correlation coefficients were calculated for total CPC score and each of the four measures of recidivism, with each of these associations being not significant.

Table 8. Recidivism Rates by CPC Rating

CPC Rating	Yes – Technical Violation[a]	
	N	%
Ineffective	955	49.0
Needs Improvement	382	48.1
Effective	247	46.0
	Yes – Arrest[b]	
Ineffective	560	28.7
Needs Improvement	251	31.6
Effective	142	26.4
	Yes – Incarceration[c]	
Ineffective	970	49.8
Needs Improvement	389	48.9
Effective	250	46.6
	Yes – Any Recidivism[d]	
Ineffective	1089	55.9
Needs Improvement	439	55.2
Effective	287	53.4

[a] Pearson x^2 =1.542, p =.462, [b] Pearson x^2 =4.320, p =.115, [c] Pearson x^2 =1.745, p =.418, [d] Pearson x^2 =1.010, p=.604

Program Length Categories and Recidivism

This next section presents the last set of descriptive tables before answering research question one. In order to make this information readily interpretable, the average program length was collapsed into three categories. Category 1 included an average program length from one to three months. Category 2 included an average program length from 3 to 6 months and category 3 included an average program length of 7 or more months. Tables 9 through 11 present the crosstabulations and Pearson chi-square values when examining the recidivism rates by average program length category and risk level.[13]

Table 9 depicts the rates of recidivism based on average program month categories for low risk offenders. To interpret this table, the total number of low risk offenders is presented within the table title and then the total number of low risk offenders who experienced each recidivism type is shown within the top row of the table. For each row, the total number of

[13] In the Appendix section, the full descriptive tables for each program length category and recidivism rates by risk level are presented.

offenders exposed to that average amount of programming is offered. For example, in Table 9, there were 864 low risk offenders in the sample with 510 low risk offenders who had an average program length of 1 to 3 months. There were 268 low risk offenders who had an average of 4 to 6 months of programming and 86 low risk offenders who had an average of 7 or more months of programming. Of these 864 low risk offenders, 313 or 36% had a technical violation.

Across all recidivism types in Table 9, the lowest overall rate was for arrests, at 21%. Any recidivism was found to have the highest overall rate, 42% for low risk offenders followed by incarceration at nearly 37%. For Tables 9 through 11, any recidivism will consistently have the highest overall recidivism rate as it is a composite measure.

Between 1 to 3 months of programming, the recidivism rates were higher than the overall rate by recidivism type. Specifically, for technical violations, the recidivism rate was almost 43% for low risk offenders who had an average of 1 to 3 months of programming. Yet, the rate decreased to 29% once the low risk participated in an average of 4 to 6 months of programming. This finding is similar across all recidivism types once the average programming length was 4 or more months, with the largest decreases in recidivism rates observed once the offender participated in 7 or more months of programming. With the exception of arrest, the findings were found to be significant, but the results should be cautiously interpreted given that fewer low risk offenders had an average of 7 or more months of programming.

Table 9. Average Program Month Categories and Recidivism – Low Risk (N=864)

Average Months	Tech. Viol.[a] (N=313, 36.2%)		Arrest[b] (N=179, 20.7%)		Incarceration[c] (N=316, 36.6%)		Any Recidivism[d] (N=362, 41.9%)	
	N	%	N	%	N	%	N	%
1-3 (N=510)	217	42.5	124	24.3	220	43.1	251	49.2
4-6 (N=268)	78	29.1	46	17.2	78	29.1	92	34.3
7+ (N=86)	18	20.9	9	10.5	18	20.9	19	22.1

[a] Pearson x^2=23.418 p =.000, [b] Pearson x^2=11.579 p =.003, [c] Pearson x^2=24.989 p =.000, [d] Pearson x^2=31.383 p=.000

Table 10 presents the results for the moderate risk offenders. Almost 58% of moderate risk offenders experienced any recidivism. Overall recidivism rates were lowest for a new arrest at 30%. Recidivism rates observed at 1 to 3 months of programming were higher than the overall. For technical violations, moderate risk offenders who were in the program an average of 1 to 3 months had about a 3% higher recidivism rate than all moderate risk in the sample. About 30% of the moderate risk offenders had a new arrest which nearly mirrored the moderate risk offenders at 31% who were in the program an average of 1 to 3 months. For both incarceration and any recidivism, the failure rates observed at 1 to 3 months were higher than the overall recidivism rate respectively for each of these types. Moderate risk offenders who received an average of 4 to 6 months of programming had the lowest rates of recidivism within each recidivism type and increases in recidivism between 4 to 6 months and 7 or more months was noted for each recidivism type. The results were significant for any recidivism; however, increases in recidivism were still revealed for between 4 to 6 months and 7 or more months of programming.

Table 10. Average Program Month Categories and Recidivism – Moderate Risk (N=1409)

Average Months	Tech. Viol.[a] (N=703, 49.9%)		Arrest[b] (N=428, 30.4%)		Incarceration[c] (N=717, 50.9%)		Any Recidivism[d] (N=814, 57.8%)	
	N	%	N	%	N	%	N	%
1-3 (N=806)	428	53.1	249	30.9	442	54.8	498	61.8
4-6 (N=481)	217	45.1	137	28.5	217	45.1	248	51.6
7+ (N=122)	58	47.5	42	34.4	58	47.5	68	55.7

[a] Pearson x^2=7.983 p =.018, [b] Pearson x^2=1.864 p =.394, [c] Pearson x^2=11.996 p =.002, [d] Pearson x^2=13.142 p=.001

Table 11 presents the recidivism rates for high risk offenders by average program length categories. Similar to Tables 9 and 10, new arrest has the lowest overall recidivism rate and the average program length of 1 to 3 months revealed a higher recidivism rate than the overall within each recidivism type. Starting with 4 to 6 months of programming the recidivism rates decreased, with the largest reductions observed when the high risk offender has an average of 7

or more months of programming. Significant findings were observed for incarceration and any recidivism, but again, caution should be taken when interpreting these results given the smaller number of higher risk offenders exposed to 7 or more months of programming.

Table 11. Average Program Month Categories and Recidivism – High Risk (N=1008)

Average Months	Tech. Viol. (N=568, 56.3%)		Arrest (N=346, 34.3%)		Incarceration (N=576, 57.1%)		Any Recidivism (N=639, 63.4%)	
	N	%	N	%	N	%	N	%
1-3 (N=573)	343	59.9	218	38.0	350	61.1	392	68.4
4-6 (N=352)	187	53.1	105	29.8	188	53.4	207	58.8
7+ (N=83)	38	45.8	23	27.7	38	45.8	40	48.2

[a] Pearson x^2=8.127 p =.017, [b] Pearson x^2=8.284 p =.016, [c] Pearson x^2=10.008 p =.007, [d] Pearson x^2=17.674 p=.000

Group Hours and Recidivism

To help with interpretation with total number of group hours, ranges of hours were collapsed into three categories. Low dosage indicates offenders received 0 to 99 hours of group time. Moderate dosage represents 100 to 199 hours of group time. High dosage represents 200 or more hours of group time. These categories were based on previous research that has examined dosage as measured by group hours (Sperber, Latessa, and Makarios, 2013a; Bourgon and Armstrong, 2005; Sperber and Lowenkamp, 2016). Table 12 is structured similarly to the program length tables with group hours, risk level, and recidivism rates presented. The total number of offenders by risk level is listed in the 'Dosage' column. For example, there are 864 low risk offenders, 618 received the low dosage of group hours (-0-99 hours), 65 offender received the moderate dosage (100-199 hours) and 181 received the high dosage (200+ hours).

As illustrated below, no results revealed any statistical significance between group hour categories for low risk offenders. While not significant, it is interesting to note that increased group hours for low risk resulted in increased recidivism rates for technical violations,

incarceration, and any recidivism. Given the research on the risk principle and the potential harmful impact of exposing low risk offenders to increased dosage, this may be expected.

The moderate risk group similarly experienced increases in recidivism rates for all four measures based on the increases in group hours. Statistically significant results were found ($p \leq .01$ level) for the moderate risk group and group hours for incarceration and any recidivism. The increase in rates by group hours suggests that incarceration and any recidivism increased with increases in group hours.

When examining the recidivism rates by group hours for the high risk group, statistically significant results were found for technical violations, incarceration, and the any recidivism measure; however, the rates revealed an increase in recidivism as dosage increased. Overall, for each measure of recidivism, the dosage category of 200+ hours was found to have the highest rates of recidivism.

Table 12. Group Hour Categories, Risk Level, and Recidivism

Dosage by Risk	Tech. Viol.[a] (N=313, 36.2%)		Arrest[b] (N=179, 20.7%)		Incarceration[c] (N=316, 36.6%)		Any Recidivism[d] (N=362, 41.9%)	
Low (N=864)	N	%	N	%	N	%	N	%
0-99 (N=618)	213	34.5	127	20.6	215	34.8	245	39.6
100-199 (N=65)	26	40.0	19	29.2	26	40.0	29	44.6
200+ (N=181)	74	40.9	33	18.2	75	41.4	88	48.6
	Tech. Viol.[a] (N=703, 49.9%)		Arrest[b] (N=428, 30.4%)		Incarceration[c] (N=717, 50.9%)		Any Recidivism[d] (N=814, 57.8%)	
Mod. (N=1409)	N	%	N	%	N	%	N	%
0-99 (N=976)	464	47.5	283	29.0	472	48.4	540	55.3
100-199 (N=130)	65	50	48	36.9	66	50.8	76	58.5
200+ (N=303)	174	57.4	97	32.0	179	59.1	198	65.3
	Tech. Viol.[a] (N=568, 56.3%)		Arrest[b] (N=346, 34.3%)		Incarceration[c] (N=576, 57.1%)		Any Recidivism[d] (N=639, 63.4%)	
High (N=1008)	N	%	N	%	N	%	N	%
0-99 (N=690)	376	54.5	228	33.0	381	55.2	425	61.6
100-199 (N=76)	35	46.1	20	26.3	36	47.4	38	50.0
200+ (N=242)	157	64.9	98	40.5	159	65.7	176	72.7

Low: [a]Pearson x^2=2.929 p=.231, [b]Pearson x^2=3.559 p=.169, [c]Pearson x^2=3.022 p=.221, [d]Pearson x^2=4.845 p=.049
Mod: [a]Pearson x^2=9.037 p=.011, [b]Pearson x^2=3.898 p=.142, [c]Pearson x^2=10.623 p=.005, [d]Pearson x^2=9.541 p=.008
High:[a]Pearson x^2=11.396 p=.003, [b]Pearson x^2=6.753 p=.034, [c]Pearson x^2=11.249 p=.004, [d]Pearson x^2=15.922 p=.000

Before presenting the multivariate findings, a brief summary of the descriptive findings and bivariate analyses are provided. First, the LSI-R total score and risk levels indicated a significant positive relationship with each measure of recidivism, so as total score or risk level increased, so did recidivism. Both program length and group hours significantly differed within and between LSI-R risk levels and CPC program effectiveness. Significant, but negative relationships, were observed with program length (in months) and recidivism. With the exception of incarceration, significant, but positive relationships, were noted with group hours and recidivism. Based on the CPC program rating, programs identified as effective did have

lower rates of recidivism; however, the bivariate analysis examining CPC program rating and recidivism was not shown to be significant.

Multivariate Analysis

Multiple multivariate logistic regression models were conducted to identify if dosage, risk, program effectiveness (based on total CPC) score, and appropriate interaction terms (CPC total score*dosage, risk*dosage) were found to be significantly related to each of the four recidivism measures while controlling for multiple variables (sex, race, age at release, risk, sex offender, problems with drugs, and problems with assaultive behavior). The multivariate models within this section are organized by recidivism measure, technical violation, arrest, incarceration, any recidivism. Each section begins with building the different multivariate models to examine if the addition of variables increases the model goodness of fit and explaining variation across models.

Technical Violations – Dosage and Risk

Technical Violations and Program Length

To start, Table 13 presents three regression models. The first model examines if the control variables, sex, race, age, drug problems, assaultive behavior, and risk are predictors of technical violations. The second model adds in the program length categories. The third model adds in the interaction effective of dosage and risk.[14] For Model 1, sex, drug problems, and risk were all found to be statistically significant predictors of technical violations; however, age, race, assault problems, and sex offender were not significant predictors. Males were significantly more likely to have a technical violation than females. The odds of a technical violation increase 1.7 times for those with a drug problem. Increase in risk based on the LSI-R also suggests an

[14] The Appendix contains the full multivariate logistic regression models. See Tables A4 through A6.

increase in the odds for a technical violation 1.6 times for an offender who is classified as moderate risk and 2.1 times for an offender who scores as high risk. While the goodness of model fit (x^2=167.344) is significant, these measures explain just a modest amount of the variation in experiencing a technical violation.

In Model 2, the significant independent variables include sex, drug problems, assault problems, risk, and program length. Low risk and 1-3 months were the referent groups for these independent variables. Males were significantly more likely to experience a technical violation than females. Those with drug problems were almost 1.7 times more likely to experience technical violations and those with assaultive behavior were 1.3 times more likely to experience technical violations. Moderate and high risk offenders were significantly more likely to have a technical violation, 1.6 times for moderate risk and 2.1 times for high risk. When examining if program length is predictive of technical violations, the findings were found to be statistically significant. Based on these results and considering the overall impact of the control measures in this model, the odds of recidivating decrease with increases in program length. Specifically, for 4 to 6 months of programming, there is a 35.4% decrease in the odds of a new technical violation. With 7 or more months of programming, there is a 45.6% decrease in the odds of a new technical violation. When examining the model statistics, there was an increase in the step model x^2 = 41.98 and Pseudo R^2 values from Models 1 to 2. This indicates an increase in model fit and explained variation when program length categories were added.

Based on the results observed in Model 2, a third regression model examining if there is an interaction between risk and dosage on technical violations was conducted. In particular, sex, drug problems, assaultive behavior, risk, and the program length categories were found to be statistically significant predictors of technical violations, and the interaction between risk and

dosage. As risk and dosage increase, the odds of a technical violation increase 1%. However, the addition of the interaction measure did not offer much additional explanation when examining the Pseudo R^2 values between Models 2 and 3.

Table 13. Technical Violation Predicted by Risk and Program Length

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.656**	.519	-.625**	.535	-.625**	.536
Race	.061	1.063	-.003	.997	.010	1.010
Age	-.008	.992	-.009	.991	-.009	.991
Sex Offender	.307	1.359	.463	1.589	.457	1.580
Drug	.514**	1.673	.532**	1.702	.528**	1.695
Assault	.231	1.260	.275**	1.317	.276**	1.317
Low Risk (referent)						
Moderate Risk	.483**	1.620	.490**	1.632	.381**	1.464
High Risk	.742**	2.101	.752**	2.120	.537**	1.710
1-3 Mos. (referent)						
4-6 Months	N/A	N/A	-.436**	.646	-.632**	.531
7+ Months	N/A	N/A	-.609**	.544	-1.141**	.319
Dosage*Risk	N/A	N/A	N/A	N/A	.003*	1.003
Constant	-.744	.475	-.544	.580	-.626	.535

Model 1: Model x^2=167.344, -2 Log Likelihood=4377.196, Pseudo R^2= .050 to .066, **p<.001
Model 2: Model x^2=209.324, -2 Log Likelihood=4335.215, Pseudo R^2= .062 to .082, **p≤.001
Model 3: Model x^2=216.018, -2 Log Likelihood=4328.521, Pseudo R^2= .064 to .085, **p≤.001, *p≤.01

Technical Violations and Group Hours

Table 14 depicts the results of the impact of dosage, measured as total number of group hours, on technical violations.[15] This table contains three regression models. Models 2 and 3 add in group hours and then an interaction term with risk and group hours respectively. Model 1 is repeated from the previous table in order to examine improvement on goodness of fit between models.

In Model 2, there were several significant predictors of technical violation, including sex, drug problem, risk, and 200 or more hours of group time. Males were significantly more likely

[15] The Appendix contains the full multivariate logistic regression models. See Tables A7 through A8.

to experience a technical violation than females. Offenders with drug problems were also more likely to have a technical violation. Being moderate or high risk was significantly associated with technical violations. The odds of a technical violation increased 1.6 times for moderate risk offenders and nearly 2.1 times for high risk. Finally, for dosage, the 200 or more category was found to a significant predictor of technical violations and the odds of a technical violation increased almost 1.5 times with 200 or more group hours. When examining goodness of fit, it is important to recognize that the original model was based on Model 1 which presented the regression model predicting technical violation with the control variables. There did appear to be in increase in the step model $x^2 = 19.85$, but the Pseudo R^2 values suggest just a modest increase in explaining variation when the group hour categories were added to the model.

Model 3 presents the regression model predicting technical violation with the interaction term of group hours and risk. Significant predictors of technical violation included being male, having a drug problem, and risk. Those with a drug problem are 1.7 times more likely to experience a technical violation than those without a drug problem. Both moderate and high risk offenders have increased odds to experience a technical violation, 1.5 times and 1.9 times respectfully. The group hour categories were not significant and the coefficient for the interaction term (dosage and risk) indicates no relationship with the interaction term, risk and group hours, on technical violations, or simply put, the effect of group hours on technical violations does not vary with risk. When comparing goodness of fit, the addition of the interaction term offers just minimal improvement.

Table 14. Technical Violation Predicted by Risk and Group Hours

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.656**	.519	-.580**	.560	-.582**	.559
Race	.061	1.063	.007	1.007	-.005	.995
Age	-.008	.992	-.008	.992	-.009	.991
Sex Offender	.307	1.359	.285	1.330	.322	1.380
Drug	.514**	1.673	.539**	1.714	.535**	1.708
Assault	.231	1.260	.238	1.269	.239	1.269
Low Risk (referent)						
Moderate Risk	.483**	1.620	.481**	1.617	.425**	1.529
High Risk	.742**	2.101	.729**	2.073	.617**	1.853
0-99 (referent)						
100-199	N/A	N/A	-.075	.927	-.299	.742
200+	N/A	N/A	.383**	1.467	-.174	.840
Dosage*Risk	N/A	N/A	N/A	N/A	.000	1.000
Constant	-.744	.475	-.823	.439	-.770	.463

Model 1: Model x^2=167.344, -2 Log Likelihood=4377.196, Pseudo R^2= .050 to .066, **p<.001
Model 2: Model x^2=187.196, -2 Log Likelihood=4347.353, Pseudo R^2= .055 to .074, *p≤.001
Model 3: Model x^2=197.866, -2 Log Likelihood=4346.673, Pseudo R^2= .059 to .078, *p≤.001

Arrests – Dosage and Risk

Arrests and Program Length

This next section presents the multivariate logistic regression analyses predicting arrest.[16] Each of these models and those that follow for the remaining recidivism measures will be similarly organized based on the control measures and independent variables added into each model.

For Model 1 in Table 15, which examines the impact of the control variables on arrest, age and risk were identified as statistically significant predictors of arrest. However, sex, race, drug problems, assaultive behavior, and sex offender were not significant predictors. Younger offenders are significantly more likely to be rearrested than an older offender. The odds of a new arrest increase 1.6 times for moderate risk offenders. The odds of a new arrest increase almost 2

[16] The Appendix contains the full multivariate logistic regression models. See Tables A9 through A11.

times for a high risk offender. While the goodness of model fit (x^2=107.793) is significant, the Pseudo R^2 values (.032 to .046) are relatively low in terms of explaining the variation for a new arrest. The next multivariate model adds in the program length categories.

Model 2 includes all measures from Model 1 and adds in the program length dosage categories. Significant independent variables that are predictive of arrest include age, risk, and the 4 to 6 month program dosage category. Low risk and 1-3 months were the referent groups for these independent categorical variables. Young offenders were significantly more likely to experience an arrest than older offenders. Moderate and high risk offenders were significantly more likely to have been rearrested, nearly 1.6 times for moderate risk and almost 2.0 times for high risk. When examining if program length is predictive of rearrest, the findings were statistically significant for the 4 to 6 month program length category. Based on these results and considering the overall impact of the control measures in this model, the odds of recidivating decrease with increases in program length for this category. Specifically, for 4 to 6 months of program length, there is a 27.9% decrease in the odds of a rearrest. When examining the model statistics, there was an increase in the step model x^2 = 16.614 and Pseudo R^2 values from Models 1 and 2, but both of these values are low (.037 to .053) for explaining variation when program length categories were added.

Model 3 presents the regression model predicting new arrest with the interaction term of program length and risk. Significant predictors of new arrest are being young, risk, and the program length dosage category of 4 to 6 months. Both moderate and high risk offenders have increased odds to experience a new arrest, 1.5 times and 1.8 times respectfully. Regarding the 4 to 6 months of programming, there is a 32.8% decrease in the odds of a rearrest. The interaction term was not significant, which indicates that program length dosage does not vary by risk when

predicting arrest. The addition of the interaction term did not improve goodness of fit for this model.

Table 15. Arrest Predicted by Risk and Program Length

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.512	.599	-.489	.613	-.488	.614
Race	-.157	.855	-.199	.820	-.194	.824
Age	-.024*	.976	-.025*	.975	-.025*	.975
Sex Offender	-.415	.660	-.297	.743	-.301	.740
Drug	.237	1.268	.248	1.281	.246	1.280
Assault	.050	1.051	.076	1.079	.076	1.079
Low Risk (referent)						
Moderate Risk	.448*	1.564	.452*	1.571	.413*	1.512
High Risk	.671*	1.957	.679*	1.971	.604*	1.829
1-3 Mos. (referent)						
4-6 Months	N/A	N/A	-.327*	.721	-.397*	.672
7+ Months	N/A	N/A	-.340	.712	-.529	.589
Dosage*Risk	N/A	N/A	N/A	N/A	.001	1.001
Constant	-.558	.573	-.407	.666	-.435	.647

Model 1: Model x^2=107.793, -2 Log Likelihood=3846.227, Pseudo R^2= .032 to .046, *p≤.001
Model 2: Model x^2=124.407, -2 Log Likelihood=3829.613, Pseudo R^2= .037 to .053, *p≤.001
Model 3 Model x^2=125.104, -2 Log Likelihood=3828.916, Pseudo R^2= .037 to .053, *p≤.001

Arrests and Group Hours

Table 16 presents the results of the impact of dosage, measured as total number of group hours within three categories (0-99 hours, 100-199 hours, and 200+ hours), on arrest. Similar to the previous tables, there are three regression models presented in Table 16, including Model 1 from the table above.[17] Model 1 was provided in order to compare goodness of fit between models as group hours and the interaction of group hours and risk were added to the models. Within Model 2, there were two significant predictors of arrest, age and risk. Younger offenders were significantly more likely to be rearrested than older offenders. Being moderate or high risk was significantly associated with new arrest. The odds of a new arrest increased 1.6 times for

[17] The Appendix contains the full multivariate logistic regression models. See Tables A12 through A13.

moderate risk offenders and nearly 1.9 times for high risk. Group hours were not a significant predictor of new arrest. When examining goodness of fit, it is important to recognize that the original model was based on Model 1which presented the regression model predicting arrest with the control variables. There was little improvement in terms of goodness of fit and explaining variation when the group hour categories were added to the model.

Model 3 shares the results from the regression analysis predicting arrest with the interaction term, dosage and risk. Similar to the other models building up to this last model in predicting arrest, only age and risk were found to be significant predictors of arrest. The direction of the coefficients is the same for these measures as the previous tables, indicating that younger offenders are more likely to experience a new arrest and moderate and high risk offenders have increased odds to be arrested, specifically 1.6 times for moderate risk and nearly 2.0 times for high risk. The interaction term if not significant but does not appear to have any relationship with arrest. As expected, there was little improvement in terms of goodness of fit and explaining variance when the interaction for dosage and risk was added to the model. The next section will present the results of the regression analysis predicting incarceration.

Table 16. Arrest Predicted by Risk and Group Hours

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.512	.599	-.475	.622	-.474	.622
Race	-.157	.855	-.172	.842	-.170	.844
Age	-.024*	.976	-.024*	.976	-.024*	.976
Sex Offender	-.415	.660	-.408	.665	-.413	.662
Drug	.237	1.268	.244	1.276	.245	1.277
Assault	.050	1.051	.050	1.051	.050	1.051
Low Risk (referent)						
Moderate Risk	.448*	1.564	.444*	1.559	.453*	1.573
High Risk	.671*	1.957	.666*	1.946	.684*	1.981
0-99 (referent)						
100-199	N/A	N/A	.104	1.110	.139	1.149
200+	N/A	N/A	.164	1.179	.252	1.286
Dosage*Risk	N/A	N/A	N/A	N/A	.000	1.000
Constant	-.558	.573	-.602	.548	-.612	.543

Model 1: Model x^2=107.793, -2 Log Likelihood=3846.227, Pseudo R^2= .032 to .046, *p≤.001
Model 2: Model x^2=110.949, -2 Log Likelihood=3843.071, Pseudo R^2= .033 to .047, *p≤.001
Model 3: Model x^2=111.899, -2 Log Likelihood=3842.831, Pseudo R^2= .033 to .048, *p≤.001

Incarceration – Dosage and Risk

Incarceration and Program Length

This next section presents the multivariate logistic regression analyses predicting incarceration. Table 17 presents three models examining the relationship between incarceration, program length, and risk.[18] In Model 1, several variables were statistically significant predictors of incarceration, including sex, drug problems, and risk. Males were significantly more likely to experience an incarceration than females. The odds of an incarceration increase nearly 1.7 times for offenders with a drug problem. Moderate risk offenders are almost 1.7 times more likely to be incarcerated and the odds of incarceration increases to 2.1 for high risk. The goodness of model fit (x^2=169.596) is significant and the Pseudo R^2 values (.050 to .067) are relatively modest in terms of explaining the variation for incarceration.

[18] The Appendix contains the full multivariate logistic regression models. See Tables A14 through A16.

Model 2 examines if program length, as measured in categories of 1 to 3 months, 4 to 6 months and 7 or more months is predictive of incarceration while controlling for the other demographic and risk-based measures. The statistically significant measures include being male, having a drug problem, exhibiting assaultive behavior, risk, and program length. Offenders with a drug problem are 1.7 times more likely to be incarcerated and those presenting with assaultive behavior concerns have a 1.3 increase in the odds of incarceration. Based on risk, the odds of incarceration increase almost 1.7 times for moderate risk and nearly 2.2 times for high risk. Both the 4 to 6 months and 7 months or more program length categories were revealed to be statistically significant predictors of incarceration. There is a 23.2% decrease in the odds of incarceration for offenders whose program length is 4 to 6 months. With a program length of 7 or more months, there is a 48.0% decrease in the odds of incarceration. When examining the model statistics, there was an increase in the step model $x^2 = 57.697$ and Pseudo R^2 values from Models 1 and 2. This indicates an increase in model fit and explained variation when program length categories were added.

Based on the results observed in Model 2, a third regression model examining if there is an interaction between risk and dosage on incarcerations was conducted. Model 3 displays these results. In particular, sex, drug problems, assaultive behavior, risk, and the program length categories were found to be statistically significant predictors of incarceration; however, the interaction of risk and dosage was not statistically significant. This suggests that with this sample, there was limited variation with risk based on program length dosage and that increased program length was found to result in reductions in incarceration for all risk levels. The interaction measure did not offer much additional explanation when examining the Pseudo R^2 values between the Models 2 and 3.

Table 17. Incarceration Predicted by Risk and Program Length

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.654*	.520	-.621*	.538	-.619*	.538
Race	.091	1.095	.022	1.023	.034	1.035
Age	-.009	.991	-.009	.991	-.010	.990
Sex Offender	.283	1.327	.454	1.575	.449	1.567
Drug	.516*	1.676	.536*	1.710	.533*	1.704
Assault	.214	1.239	.263*	1.301	.263*	1.301
Low Risk (referent)						
Moderate Risk	.510*	1.666	.520*	1.682	.421*	1.523
High Risk	.763*	2.145	.775*	2.171	.580*	1.785
1-3 Mos. (referent)						
4-6 Months	N/A	N/A	-.485*	.616	-.663*	.515
7+ Months	N/A	N/A	-.654*	.520	-1.138*	.320
Dosage*Risk	N/A	N/A	N/A	N/A	.003	1.003
Constant	-.728	.483	-.509	.601	-.583	.558

Model 1: Model x^2=169.596, -2 Log Likelihood=4377.626, Pseudo R^2= .050 to .067, *p≤.001
Model 2: Model x^2=220.059, -2 Log Likelihood=4327.163, Pseudo R^2= .065 to .087, *p≤.001
Model 3: Model x^2=225.596, -2 Log Likelihood=4321.626, Pseudo R^2= .066 to .089, *p≤.001

Incarceration and Group Hours

Table 18 presents the results of the impact of dosage, measured as total number of group hours, on incarceration.[19] In Model 2, there were several significant predictors of incarceration, including sex, drug problem, risk, and 200 or more hours of group time. Males were significantly more likely to be incarcerated than females. Offenders with drug problems were also more likely to be incarcerated. Being moderate or high risk was significantly associated with incarceration. The odds of incarceration increased almost 1.7 times for moderate risk offenders and 2.1 times for high risk. Finally, for dosage, the 200 or more category was found to a significant predictor of incarceration and the odds of incarceration increased almost 1.5 times with 200 or more group hours. When examining goodness of fit, it is important to recognize that the original model was based on Model 1 which presented the regression model predicting

[19] The Appendix contains the full multivariate logistic regression models. See Tables A17 through A18.

incarceration with the control variables (sex, race, age, sex offender, drug problem, assaultive behavior, and risk). There did appear to be in increase in the step model $x^2 = 21.14$, but the Pseudo R^2 values suggest just a modest increase in explaining variation when the group hour categories were added to the model.

Model 3 depicts the regression model predicting incarceration with the interaction term of group hours and risk. Significant predictors of incarceration were being male, having a drug problem, and risk. Offenders with a drug problem are 1.7 times more likely to be incarcerated than those without a drug problem. Both moderate and high risk offenders have increased odds of incarceration, 1.6 times and 1.9 times respectfully. The group hour categories were not significant and the coefficient for the interaction term (dosage and risk) indicates no relationship with incarceration. Further, the significance of the 200+ more hours dissipates when the interaction term was added to the model. Stated differently, the effect of group hours on incarceration does not vary with risk. When comparing goodness of fit, the addition of the interaction term offers just minimal improvement and there does not appear to be any additional explanation of variation across models.

Table 18. Incarceration Predicted by Risk and Group Hours

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.654*	.520	-.574*	.563	-.576*	.562
Race	.091	1.095	.036	1.037	.024	1.024
Age	-.009	.991	-.009	.991	-.009	.991
Sex Offender	.283	1.327	.261	1.299	.299	1.349
Drug	.516*	1.676	.542*	1.719	.538*	1.712
Assault	.214	1.239	.221	1.248	.222	1.248
Low Risk (referent)						
Moderate Risk	.510*	1.666	.508*	1.663	.451*	1.569
High Risk	.763*	2.145	.750*	2.117	.635*	1.886
0-99 (referent)						
100-199	N/A	N/A	-.067	.935	-.298	.742
200+	N/A	N/A	.398*	1.489	-.177	.838
Dosage*Risk	N/A	N/A	N/A	N/A	.000	1.000
Constant	-.728	.483	-.811	.444	-.756	.469

Model 1: Model x^2=169.596, -2 Log Likelihood=4377.626, Pseudo R^2= .050 to .067, *p≤.001
Model 2: Model x^2=190.733, -2 Log Likelihood=4356.489, Pseudo R^2= .056 to .075, *p≤.001
Model 3: Model x^2=201.967, -2 Log Likelihood=4345.255, Pseudo R^2= .060 to .080, *p≤.001

Any Recidivism – Dosage and Risk

Any Recidivism and Program Length

This section offers the results from the multivariate logistic regression analyses predicting any recidivism. Recall, any recidivism is a measure that is defined as the offender experiencing any new arrest, any incarceration or any technical violation. If the offender had just one of these three recidivism measures present, then the offender would also be identified as a recidivist based on the 'any recidivism' outcome measure. Table 19 presents the three regression models predicting any recidivism with dosage and risk.[20]

In Model 1, several variables were statistically significant predictors of any incarceration, including sex, drug problems, and risk. Males were significantly more likely to recidivate than females. The odds of recidivism increase nearly 1.6 times for offenders with a drug problem.

[20] The Appendix contains the full multivariate logistic regression models. See Tables A19 through A21.

Moderate risk offenders are almost 1.8 times more likely to recidivate and the odds of recidivism increases to 2.3 for high risk. The goodness of model fit (x^2=165.616) is significant and the Pseudo R^2 values (.049 to .066) are relatively modest in terms of explaining the variation for recidivism. The next two models will add in the two dosage measures, program length and interaction between program length and risk, to identify if dosage impacts recidivism.

Model 2 evaluates if program length, as measured in categories of 1 to 3 months, 4 to 6 months and 7 or more months is predictive of recidivism while controlling for sex, race, age, sex offender status, drug problems, assaultive behavior, and risk. The statistically significant predictors of recidivism include being male, being young, having a drug problem, risk, and program length. Offenders with a drug problem are 1.6 times more likely to recidivate than those who do not have a drug problem. Based on risk, the odds of recidivism increase almost 1.8 times for moderate risk and nearly 2.3 times for high risk. Both the 4 to 6 months and 7 months or more program length categories were statistically significant predictors of recidivism. There is a 41.2% decrease in the odds of recidivism for offenders whose program length is 4 to 6 months. With a program length of 7 or more months, there is a 52.6% decrease in the odds of recidivism. When comparing the model statistics, there was an increase in the step model x^2 = 62.035 and Pseudo R^2 values from Models 1 to 2. This indicates an increase in model fit and explained variation when program length categories were added.

A third regression model examining if there is an interaction between risk and dosage on any recidivism was conducted based on the significant results from the table above. Model 3 displays these results below. In particular, sex, age, drug problems, risk, and the program length categories were found to be statistically significant predictors of recidivism. The interaction term, risk and dosage, was not statistically significant. As such, there was limited variation with

risk based on program length dosage, so increased program length resulted in recidivism reductions for all risk levels. Males and younger offenders were significantly more likely to recidivate. Having a drug problem increased the odds of recidivism nearly 1.6 times. Both moderate and higher risk offenders were more likely to recidivate, as the increase in odds was 1.6 times and 1.9 times respectfully based on risk level. The interaction measure did not offer much additional explanation of variation when examining the Pseudo R^2 values between Models 2 and 3.

Table 19. Any Recidivism Predicted by Risk and Program Length

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.621*	.537	-.584*	.558	-.583*	.558
Race	.057	1.059	-.021	.980	-.008	.992
Age	-.012	.988	-.013*	.987	-.013*	.987
Sex Offender	.070	1.073	.256	1.292	.249	1.282
Drug	.442*	1.556	.464*	1.591	.460*	1.584
Assault	.146	1.157	.202	1.224	.202	1.224
Low Risk (referent)						
Moderate Risk	.570*	1.768	.582*	1.790	.474*	1.606
High Risk	.818*	2.265	.832*	2.298	.617*	1.852
1-3 Mos. (referent)						
4-6 Months	N/A	N/A	-.530*	.588	-.723*	.485
7+ Months	N/A	N/A	-.748*	.474	-1.270*	.281
Dosage*Risk	N/A	N/A	N/A	N/A	.003	1.003
Constant	-.268	.765	-.024	.976	-.104	.902

Model 1: Model x^2=165.616, -2 Log Likelihood=4345.622, Pseudo R^2= .049 to .066, *p≤.001
Model 2: Model x^2=227.651, -2 Log Likelihood=4283.587, Pseudo R^2= .067 to .090, *p≤.001
Model 3: Model x^2=234.209, -2 Log Likelihood=4277.029, Pseudo R^2= .069 to .092, *p≤.001

Any Recidivism and Group Hours

Table 20 provides the results of the impact of dosage, measured as total number of group hours, on recidivism.[21] In Model 2, there were several significant predictors of recidivism, including sex, drug problem, risk, and 200 or more hours of group time. Males were

[21] The Appendix contains the full multivariate logistic regression models. See Tables A22 through A23.

significantly more likely to recidivate than females. Offenders with drug problems were also more likely to be recidivate; with an increased odds of nearly 1.6 times that of an offender who does not have a drug problem. Similar to other models, being moderate or high risk was significantly associated with recidivism. The odds of recidivism increased almost 1.8 times for moderate risk offenders and 2.2 times for high risk. With regard to total group hour dosage, the 200 or more category was found to a significant predictor of recidivism and the odds of recidivism increased almost 1.5 times with 200 or more group hours. The group hours category of 100 to 199 hours was not found to be a statistically significant predictor of recidivism. When examining goodness of fit, it is important to recognize that the original regression model was based on Model 1 which examined the impact of the control variables on recidivism. There did appear to be in increase in the step model $x^2 = 24.92$ between Models 1 and 2, but the Pseudo R^2 values suggest just a minimal increase in explaining variation when the group hour categories were added.

Model 3 presents the regression model findings predicting recidivism with the interaction term of group hours and risk. Significant predictors of recidivism were being male, having a drug problem, and risk. Offenders with a drug problem are 1.6 times more likely to recidivate. Moderate and high risk offenders have increased odds of recidivism, nearly 1.7 times and 2.1 times respectfully. The group hour categories were not significant and the coefficient for the interaction term (dosage and risk) indicates no relationship with recidivism. As such, the 200+ more group hours was revealed to no longer be a statistically significant of recidivism when the interaction term was added to the model. Simply put, the effect of group hours on recidivism does not vary with risk. The addition of the interaction term does not

appear to provide any additional explanation of variation across models or improvement on goodness of fit.

Table 20. Any Recidivism Predicted by Risk and Group Hours

	Model 1		Model 2		Model 3	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.621*	.537	-.537*	.585	-.538*	.584
Race	.057	1.059	-.004	.996	-.010	.990
Age	-.012	.988	-.012	.988	-.012	.988
Sex Offender	.070	1.073	.042	1.043	.064	1.066
Drug	.442*	1.556	.470*	1.599	.467*	1.595
Assault	.146	1.157	.154	1.167	.154	1.166
Low Risk (referent)						
Moderate Risk	.570*	1.768	.569*	1.767	.537*	1.712
High Risk	.818*	2.265	.804*	2.234	.740*	2.096
0-99 (referent)						
100-199	N/A	N/A	-.100	.905	-.228	.796
200+	N/A	N/A	.434*	1.544	.115	1.122
Dosage*Risk	N/A	N/A	N/A	N/A	.000	1.000
Constant	-.621*	.765	-.354	.702	-.324	.723

Model 1: Model x^2=165.616, -2 Log Likelihood=4345.622, Pseudo R^2= .049 to .066, *p≤.001
Model 2: Model x^2=190.533, -2 Log Likelihood=4320.705, Pseudo R^2= .056 to .076, *p≤.001
Model 3: Model x^2=193.963, -2 Log Likelihood=4317.275, Pseudo R^2= .057 to .077, *p≤.001

This next section examines the impact of dosage and program effectiveness on technical violations, arrest, incarceration, and any recidivism. Given that the CPC total score and CPC ratings were not found to be statistically significant predictors of recidivism in the bivariate analyses, these multivariate models displayed below are provided to determine if program effectiveness, as measured by CPC total score, is a statistically significant predictor of the four recidivism measures upon controlling for sex, race, age, sex offender status, the existence of a drug problem, concerns with assaultive behavior, risk and dosage. Risk will be measured based on total LSI-R score and dosage will be measured on program length and group hours.

Technical Violations – Dosage and Program Effectiveness

Table 21 presents two regression models predicting technical violation with dosage (program length, group hours) and CPC total score.[22] In Model 1, the significant predictors include sex, problems with drugs, LSI-R total score, and average program length. Males are significantly more likely to experience technical violations than females. Offenders with drug problems were 1.7 times more likely to have a technical violation than offenders without a drug problem. Increases in the LSI-R were significantly related to technical violation. With every one point increase in the total LSI-R score the odds of a technical violation occurring increases 1.04 times. Average program length suggests that offenders who have longer program lengths were more likely to avoid a technical violation. In particular, longer program lengths are associated with a 9.2% decrease in the odds of a technical violation occurring. The CPC total score was not found to be a significant predictor of technical violations.

Model 2 shows the multivariate regression results examining the impact of group hours and program effectiveness on technical violations. Significant predictors of technical violation include being male, having a drug problem, LSI-R total score, and group hours. Increases in group hours are associated with a 1% increase in the odds of recidivism, but this finding should be cautiously interpreted given the weak coefficient. With every one point increase in the LSI-R total score, there is a 1.04% increase in the odds of a technical violation occurring. Program effectiveness, as measured by total CPC score, was not found to be a statistically significant predictor of technical violations.

[22] See the Appendix for the full multivariate regression models. See Tables A24 through A25.

Table 21. Technical Violation Predicted by Dosage and Program Effectiveness

	Program Length[a]		Group Hours[b]	
Variable	B	Exp(B)	B	Exp(B)
Sex*	-.680*	.507	-.610*	.543
Race	-.015	.985	.004	1.004
Age	-.008	.992	-.009	.992
Sex Offender	.477	1.610	.327	1.386
Drug*	.507*	1.660	.515*	1.674
Assault	.256	1.292	.229	1.257
LSI-R*	.042*	1.043	.041*	1.042
Program Length*	-.096*	.908	N/A	N/A
Group Hours*	N/A	N/A	.001*	1.001
CPC Total	-.010	.990	-.009	.992
Constant	-.568	.567	-1.116	.328

[a] -2 Log Likelihood=4331.650, Pseudo R^2= .063 to .084, *p≤.001
[b] -2 Log Likelihood=4338.081, Pseudo R2= .061 to .081, *p<.001

Arrest – Dosage and Program Effectiveness

Table 22 provides the findings for the logistic regression models predicting arrest with dosage (program length and group hours) and CPC total score.[23] Significant predictors in Model 1 include age, LSI-R total score, and average program length. Younger offenders are significantly more likely to experience arrest than older offenders. Increases in the LSI-R were significantly related to new arrests. With every one point increase in the total LSI-R score the odds of a new arrest increases 1.04 times. Average program length suggests that offenders who have longer program lengths were more likely to avoid arrests. Specifically, longer program lengths are associated with a 6.1% decrease in the odds of a new arrest. The CPC total score was not found to be a significant predictor of arrests.

Model 2 reveals the multivariate regression results examining the impact of group hours and program effectiveness on arrests. There were just two statistically significant predictors of arrest, age and LSI-R total score. Young offenders were significantly more likely to be arrested

[23] The Appendix contains the full multivariate logistic regression models. See Tables A26 through A27.

than older offenders. Similar to the results in Model 1, when examining the impact of LSI-R total score, the odds of arrest increase 1.04% with every one point increase in the LSI-R total score. Group hours and program effectiveness, as measured by total CPC score, were not found to be statistically significant predictors of arrest and there did not appear to be any relationship between group hours and arrest.

Table 22. Arrest Predicted by Dosage and Program Effectiveness

	Program Length[a]		Group Hours[b]	
Variable	B	Exp(B)	B	Exp(B)
Sex	-.535	.586	-.536	.585
Race	-.216	.805	-.175	.839
Age*	-.025*	.975	-.025*	.975
Sex Offender	-.299	.742	-.406	.666
Drug	.242	1.274	.240	1.271
Assault	.063	1.065	.044	1.045
LSI-R*	.035	1.036	.035*	1.036
Program Length*	-.063	.939	N/A	N/A
Group Hours	N/A	N/A	.000	1.000
CPC Total	.000	1.000	.003	1.003
Constant	-.754	.470	-1.108	.330

[a] -2 Log Likelihood=3831.174, Pseudo R^2= .037 to .052, *p≤.001
[b] -2 Log Likelihood=3841.558, Pseudo R^2= .034 to .048, *p≤.001

Incarceration – Dosage and Program Effectiveness

These next two models in Table 23 identify the significant predictors of incarceration when controlling for sex, race, age, sex offender status, drug problems, concerns with assaultive behavior, LSI-R total score, dosage (program length and group hours), and program effectiveness measured as the total CPC score.[24]

Model 1 examines the impact of program length and total CPC score on incarceration. The significant predictors of incarceration were sex, having a drug problem, LSI-R total score

[24] The Appendix contains the full multivariate logistic regression models. See Tables A28 through A29.

and program length. Males were significantly more likely than females to be incarcerated. Offenders who have problems with drugs have nearly a 1.7% increase in the odds of incarceration than offenders without a drug problem. Increases in the LSI-R total score were found to be predictive of incarceration, with the odds of incarceration increasing 1.04% with every one point increase on the LSI-R. Longer program lengths were associated with decreases in the odds of incarceration. Specifically, the odds of incarceration decreased 10.2% for longer program lengths. Program effectiveness based on total CPC score was not shown to be a predictor of incarceration.

Model 2 displays the results from evaluating the impact of group hours and program effectiveness on incarceration. Being male, having a drug problem, and higher LSI-R total scores were all significant predictors of incarceration. Offenders who have problems with drugs have nearly a 1.7% increase in the odds of incarceration than offenders without a drug problem. Increases in the LSI-R total score were found to be predictive of incarceration, with the odds of incarceration increasing 1.04% with every one point increase on the LSI-R. Group hours was also found reported to be a significant predictor of incarceration, but this finding should be interpreted cautiously given the coefficient value of b=.001.

Table 23. Incarceration Predicted by Dosage and Program Effectiveness

	Program Length[a]		Group Hours[b]	
Variable	B	Exp(B)	B	Exp(B)
Sex*	-.677*	.508	-.605*	.546
Race	.008	1.008	.033	1.033
Age	-.009	.992	-.009	.991
Sex Offender	.466	1.593	.299	1.348
Drug*	.510*	1.666	.518*	1.679
Assault	.244	1.276	.212	1.237
LSI-R*	.043*	1.044	.042*	1.043
Program Length*	-.107	.898	N/A	N/A
Group Hours*	N/A	N/A	.001*	1.001
CPC Total	-.011	.989	-.009	.991
Constant	-.477	.621	-1.083	.339

[a] -2 Log Likelihood=4326.248, Pseudo R^2= .065 to .087, *p≤.001
[b] -2 Log Likelihood=4337.963, Pseudo R^2= .062 to .082, *p≤.001

Any Recidivism – Dosage and Program Effectiveness

Table 24 includes two regression models that describe the significant predictors of recidivism when controlling for sex, race, age, sex offender status, drug problems, concerns with assaultive behavior, LSI-R total score, dosage (program length and group hours), and program effectiveness measured as the total CPC score.[25] These findings are similar to the previous tables examining the impact of dosage and program effectiveness.

Model 1 examines the impact of program length and total CPC score on recidivism. The significant predictors of recidivism were sex, having a drug problem, LSI-R total score and program length. Males were significantly more likely than females to be recidivate. Offenders who have problems with drugs have nearly a 1.6% increase in the odds of recidivism occurring than offenders without a drug problem. Higher total LSI-R scores were also shown to have a significant impact on recidivism. In particular, increases in the LSI-R total score were found to be predictive of recidivism, with the odds of recidivism increasing 1.05% with every one point

[25] The Appendix contains the full multivariate logistic regression models. See Tables A30 through A31.

increase on the LSI-R. Longer program lengths were associated with decreases in the odds of recidivism. As such, the odds of recidivism decreased 10.8% for longer program lengths. Program effectiveness was not a significant predictor of recidivism.

Model 2 reveals the results of the regression model evaluating the impact of group hours and program effectiveness on any recidivism. Being male, having a drug problem, and higher LSI-R total scores were all significant predictors of any recidivism. Offenders with drug problems have nearly a 1.6% increase in the odds of being a recidivist than offenders without a drug problem. For the LSI-R risk assessment total score, the odds of recidivism increase 1.04% with every one point increase on the instrument. Group hours was also found to be a significant predictor of recidivism, but this finding should be interpreted cautiously given the coefficient value of b=.001.

Table 24. Any Recidivism Predicted by Dosage and Program Effectiveness

	Program Length[a]		Group Hours[b]	
Variable	B	Exp(B)	B	Exp(B)
Sex*	-.644*	.525	-.582*	.559
Race	-.034	.967	.001	1.001
Age	-.012	.988	-.012	.988
Sex Offender	.254	1.290	.076	1.079
Drug*	.441*	1.554	.446*	1.562
Assault	.179	1.196	.143	1.154
LSI-R*	.045*	1.046	.044*	1.045
Program Length*	-.115*	.892	N/A	N/A
Group Hours*	N/A	N/A	.001*	1.001
CPC Total	-.009	.991	-.006	.994
Constant	-.066	.936	-.714	.490

[a] -2 Log Likelihood=4292.817, Pseudo R^2= .064 to .086, *p≤.001
[b] -2 Log Likelihood=4314.852, Pseudo R^2= .058 to .078, *p≤.001

Research Question One Summary

Research question one sought to identify what dosage of treatment is appropriate for low, moderate and high risk offenders to reduce their risk of recidivism. Based on these results and

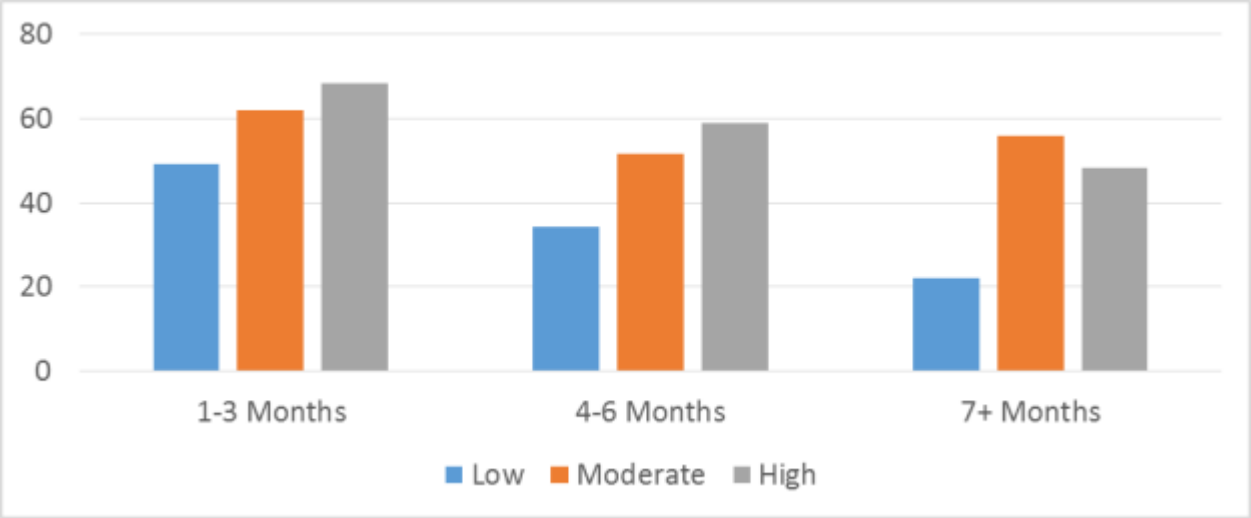
specifically for this sample, the total group hours category of 200+ hours revealed a statistically significant relationship with several recidivism measures, technical violation, incarceration, and any recidivism. The direction of this relationship indicated that 200 or more hours resulted in increases in the likelihood of recidivism. Within the regression models, once the interaction term of group hours and risk was added the statistically significant results dissipated.

When examining the dosage measure, program length, which was categorized into 1 to 3 months, 4 to 6 months, and 7 or more months, there were multiple statistically significant relationships observed. With 1 to 3 months serving as the referent group in the regression models, the overall results suggested that the odds of recidivism decreased (for all four recidivism measures) as program length increased for the 4 to 6 month category. Seven or more months of programming resulted in a statistically significant relationship with technical violations, incarcerations, and any recidivism. The interpretation is similar in that offenders within the 7 or more months program category were observed to decrease their odds of recidivism for these three outcome measures. The interaction effect of program length and risk did not reveal a statistically significant relationship, which indicates that increased program length on recidivism did not vary by risk.

Below is a chart that illustrates the recidivism rates by program length categories for each risk level. The outcome measure presented in this chart is 'any recidivism'. With the exception of moderate risk moving from 4 to 6 months to 7 or more months, increases in program length result in reductions in recidivism. It should be noted that there were fewer offenders in the program category of 7 or more months, but as it relates to the risk principle, longer program lengths resulted in improved outcomes for higher risk offenders. This same finding was revealed for low risk offenders; however, when examining any recidivism for the comparison group from

the original Pennsylvania evaluation study, the recidivism is still lower for the group that received no programming and interventions within the halfway houses and community-based correctional facilities. While the data analyzed for this question does not offer an explanation for this finding, what is known is that the low risk group was mixed with the high risk group of offenders which previous research has shown can increase the recidivism rates for low risk offenders (Andrews et al., 1990; Andrews and Dowden, 2006; Dowden and Andrews, 1999a, 1999b, 2000; Lipsey and Wilson, 1998; Lowenkamp, Latessa and Holsinger, 2006; Lowenkamp and Latessa, 2002, 2004; Lowenkamp, Smith and Bechtel, 2007; Latessa, Lowenkamp, and Bechtel, 2008).

Chart 2. Recidivism Rates by Program Length and Risk Level



Research Question Two

The next section of chapter four responds to the second research question regarding the impact of core correctional practices, including modeling and role playing, to reduce recidivism by risk level. The modeling and role playing data measures were obtained from two primary sources. The first source was from the CPC data file which simply examined if modeling and role playing were occurring and if so, what percentage of time modeling and role playing were being used. The second source was the CPAI-2000 data file. Recall, the CPAI-2000 group observation form contains several skills that have modeling steps, including the anti-criminal modeling skill and structured learning procedures for skills building. Likewise, role playing is incorporated into structured learning procedures for skills building. This research question will also examine if any of the core correctional practice skills found within the CPAI-2000 has an impact on reducing recidivism by risk level.

Research question two focuses on a subset of the full sample being examined in the current study. There are two reasons for this. First, as described in Chapter 3, the CPAI-2000 group observation forms include a confidence rating for each step within a skill or technique. Confidence ratings of three and above indicate a moderate confidence and the use of this tool requires that if the average of the confidence rating within a skill is less than three, than the rating is considered incomplete. To address this limitation and to avoid including group observations where there was an incomplete rating, group observations that had an average confidence rating of less than three within any core correctional practices skill were excluded from this analysis. There were a total of 29 group observations that met these criteria. When merging these observations with offenders assigned to these programs, there were 1920 offenders of the 3281 that were included in the analysis focusing on core correctional practices.

The second reason for examining a subset of the full sample was due to missing data for modeling and role playing. Missing data for role playing and modeling were not replaced with zero, as zero is meaningful for this analysis. For example, offenders were exposed to modeling but not role playing, so the percentage of time spent on role playing was zero. Sample sizes are consistently reported for each analysis presented in the findings below. Related to the modeling and role playing data used for this analysis, it was not possible to verify that a specific offender actually participated in a particular role play, rather the data available in the current study measure the percentage of time an offender was likely exposed to modeling and role playing activities.

This section begins with a presentation of the descriptive and bivariate analyses related to modeling, role playing, and core correctional practice skills. In particular, the percentage of time spent on modeling and role playing is reported for the sample and by risk level along with the corresponding recidivism rates. Pearson correlation coefficients were conducted examining the strength and direction of the relationship for the core correctional practice skills and the four measures of recidivism. Finally, findings from the multivariate regression analyses examining the impact of the use of core correctional practice skills (separately and overall), modeling, and role playing are presented.

Descriptives and Bivariate Analysis - Modeling

Tables 25 through 26 provide frequencies and crosstabulations on the use of modeling in programming for offenders in this sample and by risk. Table 25 indicates if the offender was involved in programming in which modeling occurred. Of the 2371 offenders, nearly 76% were involved in programming in which modeling was occurring. For these 1667 offenders who were

exposed to modeling, the range in the overall percentage of time spent on modeling was 3 percent to 85 percent.

Table 25. Frequencies for Modeling (N=2371)

Modeling Occurred	N	%
No	579	24.4
Yes	1792	75.6

Table 26. Percentage of Time Modeling is Occurring (N=1667)[26]

% Time Modeling	N	%
3	206	12.3
5	307	18.4
10	379	22.7
12	27	1.6
15	163	9.8
20	31	1.9
25	214	12.8
31	63	3.8
32	62	3.7
35	61	3.7
50	80	4.8
60	20	1.2
85	54	3.2

Modeling and Recidivism by Risk Level

Table 27 presents the crosstabulations and Pearson chi-square values for each of the recidivism measures based on whether or not modeling occurred.[27] These results are presented by risk level. No results reached statistical significance. Given that the low risk offenders received similar opportunities to observe modeling as high risk offenders, it was not surprising to see the recidivism rates higher for low risk offenders when modeling opportunities occurred. For example, when examining the number and percentage of the low risk offenders who had a technical violation based on whether or not modeling occurred, there were 478 offenders who observed modeling, and of these, 40% had a technical violation in comparison to 33% who had a

[26] Missing data were observed for N=125 cases in the data file for the percentage of time modeling.
[27] The Appendix contains the full crosstabulation tables. See Tables A32 through A43.

technical violation but did not witness any modeling, which is nearly a 7% increase in the technical violation rate.

When evaluating the arrest rates for low risk offenders based on whether or not they observed modeling, there was a 2.5% increase in arrest rates when the low risk offenders were exposed to modeling. Almost a 6.5% increase in incarceration rates occurred and a 5.7% increase in any recidivism rates based on whether or not the low risk offender observed modeling. For moderate risk, the increases in recidivism rates were 2.8% for technical violation, 7.5% for arrest, 4.1% for incarceration, and 3.5% for any recidivism when comparing the groups that did and did not observe modeling. The differences in recidivism rates based on whether or not high risk offenders observed modeling was 3.1% increase for arrests and .5% increase for incarcerations. For technical violations, there was a .7% decrease in technical violations for the group that did receive modeling exposure and a .5% decrease in incarcerations for the group that observed modeling.

Table 27. Modeling by Risk Level and Recidivism Rates

Modeling (No/Yes)	Technical Violation[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
	N	%	N	%	N	%	N	%
Low								
No (N=138)	46	33.3	26	18.8	47	34.1	55	39.9
Yes (N=478)	192	40.2	102	21.3	194	40.6	218	45.6
Mod.								
No (N=245)	123	50.2	62	25.3	124	50.6	141	57.6
Yes (N=749)	397	53.0	246	32.8	410	54.7	458	61.1
High								
No (N=196)	114	58.2	63	32.1	115	58.7	127	64.8
Yes (N=565)	325	57.5	199	35.2	329	58.2	363	64.2

Low:[a]Pearson x^2 =2.109, p=.146, [b]Pearson x^2 =.406, p=.524, [c]Pearson x^2 =1.916, p=.166, [d]Pearson x^2 =1.436, p=.231
Mod.:[a]Pearson x^2 =.580, p=.446, [b]Pearson x^2 =4.905, p=.027, [c]Pearson x^2 =1.265, p=.261, [d]Pearson x^2 =.998, p=.318
High:[a]Pearson x^2 =.001, p=.975, [b]Pearson x^2 =.611, p = .434, [c] Pearson x^2=.012, p =.914, [d]Pearson x^2 =.019, p=.890

While Table 27 addressed whether or not modeling occurred and the corresponding recidivism rates by risk level, the next step is to examine whether or not percentages of time spent modeling impacted recidivism rates by risk level. There is no prior research that suggests what the ideal percentage of time spent on modeling should be, so bivariate correlations were first calculated to measure the strength and direction of the relationship with the percentage of time spent modeling and the four recidivism measures. The bivariate analysis was repeated for each risk level. Table 28 displays these results along with the group sizes.

Percentage time modeling was significantly correlated with arrest for the total group (N=1667) and for moderate risk offenders. Both of these correlations are negative which is in the expected direction for this relationship. As such, the interpretation of the correlation indicates that as the percentage of time spent on modeling increases, there is a decrease in arrest observed. There was a significant, but positive, relationship observed for percentage of time modeling and incarceration. This suggests that as the percentage of time spent modeling increases, so does incarceration. There were no statistically significant correlations noted for technical violation and any recidivism. Given that most of these correlations produced did not achieve statistical significant and were relatively weak, collapsing percentage of time modeling into categories would not be appropriate.

Table 28. Percentage Time Modeling and Recidivism

	Technical Violation	Arrest	Incarceration	Any Recidivism
Total Group (N=1667)	.052	-.077**	.053	.023
Low (N=454)	.049	-.090	.044	.008
Moderate (N=695)	.065	-.095*	.078*	.040
High (518)	.061	-.029	.056	.044

**p≤.001, *p≤.01

Descriptives and Bivariate Analysis – Role Playing

The next set of analyses addresses the impact of role playing on recidivism by risk level. Similar to the descriptive and bivariate analysis conducted for modeling, the examination of role playing on recidivism begins with presenting the frequencies and crosstabulations on the use of role playing in programming for offenders in this sample and by risk.

Role Playing and Recidivism by Risk Level

Table 29 presents the number and percentage of offenders who were involved in programming in which role playing occurred. Of the 3249 offenders,[28] nearly 57% were involved in programming in which role playing occurred. For these 1717 offenders who were exposed to role play, the range in the overall percentage of time spent on modeling was 3 percent to 38 percent.

Table 29. Frequencies for Role Playing (N=3249)

Role Playing Occurred	N	%
No	1399	43.1
Yes	1850	56.9

[28] Missing data were observed for N=32 cases in the data file for the role playing measure.

Table 30. Percentage of Time Role Playing is Occurring (N=1717)[29]

% Time Role Playing	N	%
3	57	3.3
5	257	15.0
6	38	2.2
10	737	42.9
15	6	.3
17	124	7.2
20	42	2.4
22	63	3.7
25	37	2.2
30	214	12.5
32	62	3.6
38	80	4.7

Tables 31 and 32 depict the bivariate correlations for role playing occurring with recidivism for the total group and overall as well. Within Table 31, the correlations for the total group (N=3249) and role play indicate a statistically significant and positive relationship with each measure of recidivism. However, the direction of this relationship is not in the expected direction. Rather in this sample, the correlation indicates that increases in technical violation, arrest, incarceration and any recidivism occur with the presence of role play. Similar results were found for the low and moderate risk offender for technical violation and incarceration. The presence of role playing has a positive and significant association with technical violations and incarceration. All other correlations yielded insignificant results.

[29] Missing data were observed for N=133 cases in the data file for the percentage of time role playing.

Table 31. Role Playing and Recidivism

	Technical Violation	Arrest	Incarceration	Any Recidivism
Total Group (N=3249)	.050*	.054*	.056**	.057**
Low (N=853)	.071*	.012	.075*	.063
Moderate (N=1395)	.057*	.017	.068*	.052
High (1001)	.048	.001	.046	.025

**p≤.001, *p≤.01

Table 32 produced only one significant finding with the total group (N=1717) and percentage of time role playing on recidivism. Similar to Table 31, these results suggest a positive association with percentage of time role playing and technical violation. The nonsignificant results indicate that the time spent role playing for this sample was not associated with arrest, incarceration, and any recidivism for the total group and by risk level.

Table 32. Percentage of Time Role Playing and Recidivism

	Technical Violation	Arrest	Incarceration	Any Recidivism
Total Group (N=1717)	.053*	-.024	.047	.031
Low (N=472)	.064	-.060	.059	.057
Moderate (N=720)	.058	-.036	.055	.034
High (525)	.058	.040	.047	.029

**p≤.001, *p≤.01

Descriptives and Bivariate Analysis – Core Correctional Practices

This final step in responding to Research Question two is to examine the impact, if any, on recidivism based on the section scores and total score from the CPAI-2000. As described in Chapter 3, the CPAI-2000 group observation tool evaluates how well program staff implement core correctional practice skills within the group setting. Further, the group observation tool integrates modeling and role playing, within the anti-criminal modeling component and the structured learning procedures for skill building technique. The remaining core correctional practice skills will also be evaluated as each of these skills are intended, much like modeling and

role playing, to address behavior, both to redirect antisocial behavior and replace it with a prosocial alternative and to reinforce prosocial attitudes and behaviors as they are being displayed. These additional core correctional practice skills included on the CPAI-2000 form are: (1) effective reinforcement, (2) effective disapproval, (3) problem-solving techniques, (4) effective use of authority, (5) elements of cognitive restructuring (cognitive self change), (6) relationship practices, (7) structuring skills, and (8) motivational interviewing.

These analyses will present the bivariate correlations examining the strength and direction of the relationship between the four measures of recidivism and the section scores and CPAI-2000 total score. Bivariate correlations will be calculated for the total sample and by risk level. As discussed in Chapter 3, only 29 CPAI-2000 observations were included in this analysis. This was due to excluding the observations that did not consistently have confidence ratings of 3 and above for the core correctional practice skills.

Core Correctional Practice Skills and Recidivism

Table 33 presents the bivariate correlations for the total sample with each of the four recidivism measures, technical violation, arrest, incarceration, and any recidivism. Several core correctional practice skills had statistically significant relationships with at least one of the four measures of recidivism, but not all in the same direction. For example, anti-criminal modeling had a positive relationship with technical violation, incarceration, and any recidivism. This suggests that higher scores on the anti-criminal modeling, meaning more steps within anti-criminal modeling were being completed, are associated with increases in recidivism. However, effective reinforcement, demonstrates a significant, but negative association with technical violation, incarceration, and any recidivism. Due to the direction of this relationship being negative, or an inverse relationship, this indicates that fewer steps being properly completed

within effective reinforcement were significantly associated with increases in recidivism. Effective disapproval had similar significant negative correlations with technical violation, incarceration, and any recidivism. Problem solving techniques had a significant positive relationship emerge with any recidivism implying that more steps completed within problem solving was associated with any recidivism. Skills building had a significant and positive correlation with incarceration. Effective use of authority had significant and negative associations with technical violation, incarceration, and any recidivism, which is similar to the negative relationships that were observed with effective disapproval, indicating that fewer steps completed properly within effective use of authority were significantly, but negatively associated with these three measures of recidivism. The remaining core correctional practice skills, cognitive self change, relationship practices, structuring skills (which include modeling and role playing) and motivational interviewing did not reveal any statistically significant relationships with any of the four measures of recidivism. When examining the correlations with CPAI-2000 and total score, no statistically significant relationships were observed with any of the four measures of recidivism. Overall, when examining these bivariate correlations and recidivism, it appears that fewer steps properly completed within effective reinforcement, effective disapproval and effective use of authority, there were significant increases observed with technical violations, incarcerations, and any recidivism. However, while statistically significant, it should be noted that these correlations are generally weak. The next three tables present these bivariate analyses for low, moderate, and high risk.

Table 33. CPAI-2000 Section Scores, Total Score and Recidivism (Total Sample N=1960)

	Tech. Violation	Arrest	Incarceration	Any Recidivism
Anti-Criminal Modeling	.061**	.000	.065**	.045*
Effective Reinforcement	-.052*	-.004	-.046*	-.047*
Effective Disapproval	-.052*	.000	-.061*	-.063*
Problem Solving	.034	.025	.038	.046*
Skills Building	.034	-.004	.046*	.040
Effective Use of Authority	-.064*	0.011	-.067**	-.060**
Cognitive Self Change	.000	.003	.007	.005
Relationship Practice	.010	.022	.002	-.012
Structuring Skills	-.017	.019	-.018	-.015
Motivational Interviewing	-.015	.022	-.021	.002
Total Score	-.021	.012	-.018	-.018

**p≤.01, *p≤.05

Table 34 presents the bivariate correlations for the CPAI sections and recidivism by risk level. Starting with the low risk group, only anti-criminal modeling was found to have a statistically significant and positive relationship with technical violation. This suggests that more steps being properly completed within anti-criminal modeling was associated with increases in technical violations.

For the moderate risk group, anti-criminal modeling, effective reinforcement, and effective use of authority were observed to have statistically significant correlations with recidivism, but the direction of the relationships was not consistent. Specifically, anti-criminal modeling was found to have positive and significant correlations with technical violation, incarceration, and any recidivism. Due to the direction of this relationship, the interpretation of these results indicates that more steps being properly completed within anti-criminal modeling were significantly related to increases in these three measures of recidivism. Effective reinforcement and effective use of authority were both found to have negative but significant associations with technical violation and incarceration. Effective reinforcement also had a significant but negative relationship with any recidivism. These negative associations indicate

that the fewer steps being properly completed were associated with increases within these respective recidivism measures.

For the high risk group, the statistically significant correlations that emerged were all inverse relationships with recidivism. This is also the first bivariate analysis that revealed any statistically significant relationship between total CPAI-2000 score and any recidivism. For effective disapproval, fewer steps being completed were significantly associated with increases in all four measures of recidivism. For effective use of authority, fewer steps being properly completed were significantly associated with increases with arrests, incarceration, and any recidivism. Finally, for CPAI-2000 total score, fewer core correctional practice skills being properly completed was associated with increases in recidivism for the high risk group. These correlations appear to be weak to modest in terms of strength of the association.

Table 34. CPAI-2000 Section Scores, Total Score and Recidivism by Risk Level

	Tech. Violation	Arrest	Incarceration	Any Recidivism
	Low Risk (N=498)			
Anti-Criminal Modeling	.094*	.011	.085	.044
Effective Reinforcement	.000	.052	.006	.015
Effective Disapproval	-.039	.045	-.047	-.066
Problem Solving	.063	.021	.053	.081
Skills Building	.054	.031	.057	.050
Effective Use of Authority	-.043	-.004	-.039	-.046
Cognitive Self Change	.026	.004	.021	.037
Relationship Practice	.014	-.003	.018	-.008
Structuring Skills	.043	.084	.045	.044
Motivational Interviewing	-.003	.078	.002	.027
Total Score	.046	.063	.043	.037
	Moderate Risk (N=844)			
Anti-Criminal Modeling	.102**	.024	.117**	.094**
Effective Reinforcement	-.089**	-.007	-.077*	-.082*
Effective Disapproval	-.018	.042	-.027	-.014
Problem Solving	.048	.044	.061	.060
Skills Building	.022	-.006	.046	.033
Effective Use of Authority	-.077*	.046	-.074*	-.042
Cognitive Self Change	.048	.015	.061	.053
Relationship Practice	-.007	.026	-.023	-.018
Structuring Skills	-.035	.022	-.038	-.032
Motivational Interviewing	-.026	-.004	-.036	-.029
Total Score	-.011	.065	.005	.015
	High Risk (N=618)			
Anti-Criminal Modeling	.002	-.022	.004	.004
Effective Reinforcement	-.061	-.051	-.063	-.068
Effective Disapproval	-.116**	-.093*	-.126**	-.136**
Problem Solving	.013	.020	.017	.023
Skills Building	.038	-.023	.042	.044
Effective Use of Authority	-.071	-.097*	-.087*	-.107**
Cognitive Self Change	-.042	.017	-.035	-.039
Relationship Practice	.028	.033	.020	-.011
Structuring Skills	-.041	-.032	-.043	-.042
Motivational Interviewing	-.007	.020	-.016	.027
Total Score	-.069	-.076	-.077	-.089*

**p≤.01, *p≤.05

The next series of tables presents the multivariate logistic regression model results examining the impact of core correctional practice skills with the four measures of recidivism. Similar to the regression models presented for Research Question one, these models control for sex, race, age, sex offender, risk (based on LSI-R risk level with low risk being the referent group), problems with drugs and assaultive behavior, and CPAI-2000 sections. The last set of regression models will be similarly structured, but will replace the CPAI-2000 sections with total CPAI-2000 score.

Multivariate Regression Analysis

Core Correctional Practice Skills and Recidivism

Table 35 identifies the statistically significant predictors of recidivism while controlling for a variety of other characteristics.[30] Four regression models are presented in this table, one for each outcome measure.

For Model 1, being male, having a drug problem, displaying assaultive behavior, risk, effective reinforcement, and skills building were all found to be statistically significant predictors of technical violations. Males were significantly more likely than females to experience a technical violation. Offenders with drug problems were significantly more likely to have a technical violation than those without a drug problem. The odds of a technical violation increased almost 2.0% for offenders with a drug problem. Offenders presenting with concerns regarding assaultive behavior were 1.3 times more likely to have a technical violation. Both moderate and high risk offenders were significantly more likely to experience a technical violation, with an increased odds of 1.6% and 1.9% respectively. Fewer steps being completed

[30] The Appendix contains the full multivariate logistic regression models. See Tables A44 through A47.

within effective reinforcement were significantly more likely to result in a technical violation. While not in the expected direction, more steps being completed within the skills building technique was found to be increase the odds of a technical violation by 1.1%.

Model 2 presents the logistic regression results with the CPAI 2000 sections and arrest. Only age and risk were found to be statistically significant predictors of arrest. Being young and of higher risk were both significantly related to increased odds of arrest. In particular, moderate risk offenders were 1.6 times more likely to be arrested and high risk were 1.8 times more likely to be arrested. No CPAI-2000 sections were found to have significant relationships with arrest, which may not be surprising given the bivariate relationship results.

Model 3 depicts the results of the logistic regression analysis examining the CPAI-2000 sections and incarceration. Several statistically significant predictors of incarceration emerged. Being male, having a drug problem, risk, and skills building were all found to be significant predictors of incarceration. Males were significantly more likely than females to be incarcerated. Offenders with drug problems were significantly more likely to be incarcerated than those without a drug problem. The odds of incarceration increased almost 2.0% for offenders with a drug problem. Both moderate and high risk offenders were significantly more likely to be incarcerated, with an increased odds of 1.7% for moderate risk and nearly 2.0% for high risk offenders. Similar to the regression model predicting technical violations, more steps being completed within the skills building technique was found to increase the odds of incarceration by 1.2%.

Model 4 presents the results of the regression analysis examining the CPAI-2000 sections and any recidivism. There were four statistically significant predictors of any recidivism. Specifically, being male, having a drug problem, risk, and skills building were all found to be

significant predictors. Males were significantly more likely than females to experience any form of recidivism. Offenders with drug problems were significantly more likely to recidivate than those without a drug problem. The odds of recidivism increased almost 1.9% for offenders with a drug problem. Both moderate and high risk offenders were significantly more likely to recidivate with an increased odds of 1.8% for moderate risk and 2.1% for high risk offenders. Similar to the previous regression model predicting technical violations and incarceration, more steps being completed within the skills building technique was found to increase the odds of recidivism by 1.1%.

Table 35. Recidivism Predicted by CPAI 2000 Sections (N=1960)

	Tech Violation[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.632*	.531	-.264	.768	-.625*	.535	-.597*	.551
Race	-.030	.970	-.046	.955	.021	1.021	.058	1.060
Age	-.010	.990	-.021**	.979	-.010	.990	-.012	.988
Sex Off.	.498	1.645	-1.532	.216	.456	1.577	.159	1.173
Drug	.677**	1.968	.340	1.405	.689**	1.991	.641**	1.899
Assault	.276*	1.318	-.030	.970	.256	1.291	.137	1.147
Low- ref.								
Moderate	.477**	1.611	.484**	1.623	.522**	1.685	.609**	1.838
High	.663**	1.941	.612**	1.844	.672**	1.959	.760**	2.139
AC Mod.	.112	1.119	-.004	.996	.111	1.118	.098	1.103
Eff. Rein.	-.159*	.853	.056	1.057	-.156	.856	-.126	.881
Eff. Dis.	-.058	.943	.078	1.081	-.067	.935	-.058	.944
Prob. Sol.	.032	1.033	.100	1.106	.033	1.034	.052	1.054
Sk. Build	.138**	1.148	.045	1.046	.148**	1.159	.128	1.136
Eff. Auth.	-.043	.958	-.034	.967	-.046	.955	-.044	.957
Cog.Chg.	-.036	.965	.018	1.018	-.028	.972	-.032	.968
Relation	.055	1.056	.123	1.131	.043	1.043	.021	1.021
St. Skill	-.216	.806	-.261	.770	-.182	.833	-.230	.794
M.I.	.066	1.069	.117	1.124	.048	1.049	.115	1.122
Constant	-.531	.588	-1.319	.267	-.450	.638	-.141	.869

[a] Model x^2=152.075, -2 Log Likelihood=2563.574, Pseudo R^2= .075 to .100, **p≤.001, *p≤.01
[b] Model x^2=64.495, -2 Log Likelihood=2346.796, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01
[c] Model x^2=156.788, -2 Log Likelihood=2555.839, Pseudo R^2= .077 to .103, **p≤.001, *p≤.01
[d] Model x^2=143.707, -2 Log Likelihood=2516.922, Pseudo R^2= .071 to .095, **p≤.001, *p≤.01

Overall, when controlling for sex, race, age, sex offender status, drug problems, assaultive behavior, and risk, the effect of the individual CPAI-2000 sections dissipates within the multivariate models and unexpectedly, skills building emerged as a statistically significant predictor, but not in the expected direction. The next series of regression models examine if the CPAI-2000 total score is a predictor of the four measures of recidivism while controlling for sex, race, age, sex offender status, drug problems, assaultive behavior, and risk.

CPAI-2000 and Recidivism

Table 36 presents the four logistic regression models predicting the measures of recidivism with the CPAI total score while controlling for sex, race, age, sex offender status, drug problems, concerns with assaultive behavior, and risk.[31] For each of the four regression models, the CPAI-2000 total score was not found to be a statistically significant predictor of technical violations, arrest, incarceration and any recidivism. In terms of demographic control variables, only age was found to be a statistically significant predictor of arrests, with younger offenders being more likely to be arrested than older offenders. Having a drug problem was observed to be a statistically significant predictor of all four measures of recidivism. The odds of recidivism increase for those with a drug problem, 1.9 times for technical violations, incarceration and any recidivism, and 1.4 times for arrest. Related to risk, both moderate and high risk offenders were significant predictors for all recidivism measures. For moderate risk, offenders were 1.6 times more likely to have a technical violation, arrest or incarceration. The odds of any recidivism occurring increases 1.8% for moderate risk offenders. For high risk offenders, the odds of recidivism increases 1.9 times for technical violations and incarceration. Regarding arrest, the odds of a new arrest increases nearly 1.8 times for a high risk offender. For

[31] The Appendix contains the full multivariate logistic regression models. See Tables A48 through A51.

any recidivism, the odds of any recidivism occurring with high risk offenders increases 2.0 times.

Table 36. Recidivism Predicted by CPAI 2000 Total Score (N=1960)

	Tech Violation[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.509	.601	-.302	.740	-.491	.612	-.466	.628
Race	.067	1.070	-.043	.958	.127	1.135	.154	1.166
Age	-.008	.992	-.019**	.981	-.008	.992	-.009	.991
Sex Off.	.353	1.423	-1.394	.248	.322	1.380	.104	1.109
Drug	.659**	1.932	.353*	1.423	.666**	1.946	.620**	1.859
Assault	.253	1.288	-.008	.992	.231	1.260	.123	1.131
Low- ref.								
Moderate	.443**	1.558	.466**	1.593	.486**	1.626	.572**	1.772
High	.615**	1.851	.586**	1.796	.623**	1.865	.714**	2.042
CPAI	-.002	.998	.009	1.009	-.001	.999	-.001	.999
Constant	-.672	.511	-.931	.394	-.681	.506	-.354	.702

[a] Model x^2=104.896, -2 Log Likelihood=2610.843, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01
[b] Model x^2=55.690, -2 Log Likelihood=2355.602, Pseudo R^2= .028 to .040, **p≤.001, *p≤.01
[c] Model x^2=105.088, -2 Log Likelihood=2607.539, Pseudo R^2= .052 to .070, **p≤.001, *p≤.01
[d] Model x^2=100.128, -2 Log Likelihood=2560.501, Pseudo R^2= .050 to .067, **p≤.001, *p≤.01

Research Question Two Summary

Research question two examined the impact of modeling and role playing as well the use of core correctional practice skills with recidivism. With regarding to modeling and role playing, most of the analyses did not indicate that modeling and role playing had much of an impact on recidivism. There was one exception to this for modeling and arrests. The percentage of time modeling was significantly correlated with arrest for the total group (N=1667) and for moderate risk offenders. Both of these correlations were found to be negative which is in the expected direction for this relationship. Therefore, as the percentage of time spent on modeling increased, there was a decrease in arrest observed. One distinction is that about half of the offenders were not exposed to modeling and role playing in this sample.

Research question two also evaluated if the use of core correctional practice skills, which integrates modeling and role playing within groups, had an effect on technical reproviolations,

arrests, incarcerations, and any recidivism. Within the bivariate analyses, several interesting findings were revealed. When examining the associations between core correctional practice skills and recidivism, it appears that when fewer steps are taken to properly complete effective reinforcement, effective disapproval, and effective use of authority, there were significant increases observed with technical violations, incarcerations, and any recidivism. Several of these findings were repeated for the higher risk group and in particular, for high risk offenders, when few core correctional practice skills were being applied in the group setting (as based on the total CPAI-2000 group observation tool), there was a significant increase observed for any recidivism. While these bivariate findings offer some insight into the relationship between core correctional practices and recidivism, the significant results dissipate within the multivariate regression models. The only exception is with skills building; however, this finding was not in the expected direction as more steps properly completed within skills building was shown to be predictive of recidivism.

Research Question Three

Research question three seeks to answer what percentage of group targets, or criminogenic needs, are associated with reductions in recidivism based on LSI-R risk levels. There were a total of 28 treatment targets, primarily comprised of criminogenic and non-criminogenic needs (responsivity factors) that were identified.

The following list of treatment targets includes:

1. attitudes, orientations and values favorable to law violations
2. antisocial peer associations
3. problems associated with alcohol/drug abuse
4. anger/hostility level
5. skills of lying, stealing, and aggression
6. self-control, self-management, and problem solving skills
7. constructive use of leisure time
8. skills in interpersonal conflict resolution
9. vocational achievement
10. educational achievement
11. economic/social needs
12. family affection/communication
13. family problem solving
14. offender relationship with children
15. parenting skills
16. offender relationship with significant other
17. deviant sexual arousal/attitudes/behavior

18. relapse prevention
19. harm done to victim
20. low self-esteem
21. mental health issues
22. physical health issues
23. childhood abuse/neglect issues (offender victimization)
24. trauma/PTSD
25. cognitive delay
26. literacy problems
27. race/ethnicity issues
28. client motivation

A dichotomous variable was created to describe if the target was criminogenic or not criminogenic. Treatment targets one through nineteen above were identified as criminogenic needs and targets twenty through twenty-eight were identified as non-criminogenic needs or responsivity factors. It should be noted that not every offender had each target above addressed, and one target, cognitive delays, which is a responsivity factor, was not targeted for any offender.

To address this research question properly, there were several analytical steps completed, including descriptive statistics, bivariate correlations, and logistic regression. The following presents the results for this third research question starting with basic frequency tables and descriptive statistics.

Descriptives and Bivariate Analysis

Table 37 presents the total number of criminogenic needs targeted for the offenders in this sample. Much of the focus on criminogenic needs was directed toward substance abuse (e.g., problems associated with alcohol/drug abuse, relapse prevention), vocational and educational achievement as well as anger or hostility issues. Eighty-five percent of the offenders were in programs that targeted vocation or employment. Seventy percent of the offenders were involved in programs that targeted education. Over three quarters of the offenders were in programs that targeted alcohol/drug abuse. Over 60% of the offenders were in programs that focused on relapse prevention. Almost 63% of the offenders were in programs that addressed anger/hostility levels. Nearly 58% of the offenders went to programs that targeted attitudes, orientations, and values favorable to law violations.

Table 37. Criminogenic Needs Targeted for Total Sample (N=3281)

Criminogenic Need	N	%
Attitudes, orientations and values favorable to law violations	1889	57.6
Antisocial peer associations	1251	38.1
Problems associated with alcohol/drug abuse	2473	75.4
Anger/hostility level	2055	62.6
Skills of lying, stealing, and aggression	481	14.7
Self-control, self-management, and problem solving skills	931	28.4
Constructive use of leisure time	423	12.9
Skills in interpersonal conflict resolution	360	11.0
Vocational achievement	2789	85.0
Educational achievement	2290	69.8
Economic/social needs	1124	34.3
Family affection/communication	1123	34.2
Family problem solving	1357	41.4
Offender relationship with children	487	14.8
Parenting skills	1259	38.4
Offender relationship with significant other	408	12.4
Deviant sexual arousal/attitudes/behavior	229	7.0
Relapse prevention	2042	62.2
Harm done to victim	137	4.2

Regarding non-criminogenic needs, the two primary non-criminogenic need targets were mental health with 44% of the offenders in programs to target this responsivity factor. Almost a quarter of the offenders were in programming that addressed low self-esteem. This was followed by client motivation and physical health issues.

Table 38. Non-criminogenic Needs Targeted for Total Sample (N=3281)

Non- Criminogenic Need	N	%
Low self-esteem	797	24.3
Mental health issues	1451	44.2
Physical health issues	352	10.7
Childhood abuse/neglect issues (offender victimization)	172	5.2
Trauma/PTSD	83	2.5
Cognitive delay	N/A	N/A
Literacy problems	206	6.3
Race/ethnicity issues	137	4.2
Client motivation	386	11.8

Table 39 displays the total number of criminogenic needs targeted. The average number of criminogenic needs targeted was 7. No programs were reported to target more than 13 criminogenic needs and 44 programs did not target any criminogenic needs.

Table 39. Total Criminogenic Needs Total Sample (N=3281)

Criminogenic Needs	N	%
0	44	1.3
1	18	.5
2	122	3.7
3	398	12.1
4	245	7.5
5	257	7.8
6	184	5.6
7	500	15.2
8	497	15.1
9	424	12.9
10	149	4.5
11	166	5.1
12	63	1.9
13	214	6.5
	Average = 7.04	SD = 3.1

Table 40 provides the frequencies for the total number of non-criminogenic needs targeted by programs. The average number of non-criminogenic needs targeted by programs was 1, but nearly 38% of the offenders were in programs that did not address any non-criminogenic needs.

Table 40. Total Non-Criminogenic Needs Total Sample (N=3281)

Non-Criminogenic Needs	N	%
0	1241	37.8
1	902	27.5
2	790	24.1
3	290	8.8
4	58	1.8
	Average = 1.09	SD = 1.1

Tables 41 and 42 look at the total number of criminogenic need targets and total number of non-criminogenic need targets by low, moderate, and high risk. As shown below, the average total number of criminogenic needs for each risk level is 7. The average number of non-criminogenic needs targeted is 1.

Table 41. Total Criminogenic Needs by Risk Level

	Low (N=864)		Moderate (N=1409)		High (N=1008)	
Criminogenic Needs	N	%	N	%	N	%
0	12	1.4	22	1.6	10	1.0
1	5	.6	7	.5	6	.6
2	35	4.1	58	4.1	29	2.9
3	99	11.5	183	13.0	116	11.5
4	70	8.1	103	7.3	72	7.1
5	80	9.3	100	7.1	77	7.6
6	40	4.6	83	5.9	61	6.1
7	100	11.6	166	11.8	136	13.5
8	159	18.4	247	17.5	189	18.8
9	89	10.3	194	13.8	141	14.0
10	50	5.8	59	4.2	40	4.0
11	30	3.5	54	3.8	43	4.3
12	36	4.2	51	3.6	15	1.5
13	59	6.8	82	5.8	73	7.2
	Mean=7.05	SD = 3.2	Mean=6.98	SD = 3.1	Mean=7.13	SD = 3.1

Table 42. Total Non-Criminogenic Needs by Risk

	Low (N=864)		Moderate (N=1409)		High (N=1008)	
Non-Criminogenic Needs	N	%	N	%	N	%
0	330	38.2	546	38.8	365	36.2
1	210	24.3	393	27.9	299	29.7
2	210	24.3	319	22.6	261	25.9
3	91	10.5	129	9.2	70	6.9
4	23	2.7	22	1.6	13	1.3
	Mean=1.15	SD=1.1	Mean=1.07	SD=1.1	Mean=1.07	SD=1.0

Criminogenic and Non-Criminogenic Targets with Recidivism

The next set of tables presents the bivariate correlations by total sample and risk level to determine if there is an association between total criminogenic needs and recidivism, non-criminogenic needs and recidivism, and whether or not the offenders are exposed to more criminogenic needs versus non-criminogenic needs and recidivism based on the overall percentage of criminogenic targets to non-criminogenic targets.

Table 43 presents the bivariate correlations for the total sample and by risk level. For the total sample, there were no statistically significant relationships that emerged between the number of criminogenic targets and recidivism, the number of non-criminogenic targets and recidivism, and the overall criminogenic targets percentage. All of these correlations appeared to be relatively weak.

The findings presented for the bivariate analysis focusing on the low risk group was similar to that of the total sample. In particular, all results were not statistically significant. For the moderate risk group, two statistically significant relationships emerged. In particular, the total number of non-criminogenic needs was significantly associated with incarceration and any recidivism. This was a positive relationship, which suggests that as the total number of non-criminogenic needs increased, so did incarceration and any recidivism. The strength of these relationships is relatively weak.

Regarding the high risk group, there were two significant relationships that were found between the percentage of criminogenic targets overall with arrest and any recidivism, but neither were in the expected direction. These findings indicate that as the percentage of criminogenic targets increased, so did arrest and any recidivism.

Table 43. Bivariate Correlations for Criminogenic Targets with Recidivism

	Tech Violation	Arrest	Incarceration	Any Recidivism
	Total Sample (N=3281)			
Total Criminogenic Needs	.034	.021	.032	.028
Total Non-criminogenic Needs	.027	-.006	.030	.019
% Criminogenic Targets Overall	-.009	.012	-.009	-.005
	Low Risk (N=864)			
Total Criminogenic Needs	.056	.003	.049	.042
Total Non-criminogenic Needs	.032	-.015	.029	.014
% Criminogenic Targets Overall	-.015	-.016	-.013	-.032
	Moderate Risk (N=1409)			
Total Criminogenic Needs	.023	.022	.024	.028
Total Non-criminogenic Needs	.048	.039	.056*	.056*
% Criminogenic Targets Overall	-.048	-.034	-.051	-.047
	High Risk (N=1008)			
Total Criminogenic Needs	.027	.032	.028	.013
Total Non-criminogenic Needs	.009	-.051	.010	-.011
% Criminogenic Targets Overall	.049	.098**	.048	.076*

**p≤.01, *p≤.05

Overall, the bivariate analyses indicate that there is not a significant relationship between the total number of criminogenic needs with any of the four measures of recidivism. For only the moderate risk group, there was a significant relationship between total non-criminogenic needs with incarceration and any recidivism. These two correlations were in the expected direction which could be interpreted as increases in the number of non-criminogenic needs were significantly associated with increases in these two recidivism measures. Two unexpected relationships emerged for the high risk group. In particular, both arrest and any recidivism were found to have significant correlations with the percentage of criminogenic needs. To explore these results one step further, the multivariate logistic regression models predicting technical

violations, arrests, incarcerations, and any recidivism with total non-criminogenic needs and then separately with percentage of criminogenic needs while controlling for sex, race, age, sex offender status, drug problems, assaultive behavior, and risk are presented below.

Multivariate Regression Analysis

Non-Criminogenic Needs and Recidivism

The first four regression models evaluate if non-criminogenic needs are predictive of technical violations, arrests, incarcerations, and any recidivism. Table 44 presents the results of the regression analyses examining the impact of non-criminogenic needs on all four measures of recidivism.[32] For Model 1, which examined the impact of non-criminogenic needs on technical violations, sex, drug problems, assaultive behavior, risk, and non-criminogenic needs were all statistically significant predictors of technical violations and in the expected direction. Specifically, being male, having a drug problem, exhibiting assaultive behavior, being higher risk, and having an increased exposure to non-criminogenic targets were all found to be related to technical violations. When examining the odds ratios, having a drug problem increases the odds of a technical violation 1.7 times in comparison with those who do not have a drug problem. Exhibiting assaultive behavior increases the odds of a technical violation occurring 1.2 times. Being moderate or high risk increases the odds of a technical violation by 1.6 and 2.2 times respectfully. Lastly, increasing the exposure to non-criminogenic need targets increases the odds of a technical violation 1.1 times.

Model 2 presents the results of the regression analysis examining the impact of non-criminogenic needs on arrest. Three variables were found to be predictive of arrest, including sex, age, and risk. The non-criminogenic needs variable was not a statistically significant predictor of arrest. As such, being male, being young, and being at higher risk were all predictors

[32] The Appendix contains the full multivariate logistic regression models. See Tables A51 through A54.

of arrest. Moderate to high risk offenders are more likely to experience an arrest and their odds increase by 1.6 and 2.0 times respectfully.

Model 3 displays the regression findings for evaluating the effect of non-criminogenic needs on incarceration. Sex, drug problems, risk, and non-criminogenic needs were all statistically significant predictors of incarceration and in the expected direction. Specifically, being male, having a drug problem, being higher risk, and having an increased exposure to non-criminogenic targets were all found to be related to incarceration. When examining the odds ratios, having a drug problem increases the odds of incarceration 1.7 times in comparison with those who do not have a drug problem. Being moderate or high risk increases the odds of an incarceration by 1.7 and 2.2 times respectfully. Further, increasing the exposure to non-criminogenic need targets increases the odds of incarceration 1.1 times.

Model 4 depicts the regression model findings evaluating the impact of non-criminogenic needs on any recidivism. Sex, age, drug problems, and risk were all statistically significant predictors of any recidivism. However, exposure to non-criminogenic needs was not a significant predictor of any recidivism. Being male, being young, having a drug problem, being higher risk, were all found to be related to any recidivism. When examining the odds ratios, having a drug problem increases the odds of recidivism 1.6 times in comparison with those who do not have a drug problem. Being moderate or high risk increases the odds of any recidivism by 1.8 and 2.3 times respectfully.

Table 44. Recidivism Predicted by Non-Criminogenic Needs (N=3281)

	Tech Violation[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.727**	.483	-.531*	.588	-.729**	.482	-.682**	.506
Race	.068	1.070	-.155	.856	.099	1.104	.064	1.066
Age	-.009	.991	-.025*	.976	-.009	.991	-.013**	.987
Sex Off.	.335	1.398	-.408	.665	.313	1.368	.094	1.098
Drug	.520**	1.682	.239	1.270	.522**	1.686	.447**	1.563
Assault	.223*	1.249	.047	1.048	.205	1.228	.139	1.149
Low- ref.								
Moderate	.490**	1.632	.449**	1.567	.518**	1.679	.577**	1.780
High	.752**	2.122	.674**	1.962	.774**	2.169	.826**	2.285
Non-crim	.099*	1.104	.028	1.028	.106*	1.111	.085	1.089
Constant	-.826	.438	-.579	.560	-.815	.442	-.338	.713

[a] Model x^2=175.520, -2 Log Likelihood=4369.019, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01
[b] Model x^2=108.328, -2 Log Likelihood=3845.692, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01
[c] Model x^2=178.899, -2 Log Likelihood=4368.323, Pseudo R^2= .053 to .071, **p≤.001, *p≤.01
[d] Model x^2=171.628, -2 Log Likelihood=4339.611, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01

Criminogenic Needs and Recidivism

These next series of models examine the effect of the percentage of criminogenic needs on recidivism. Table 45 evaluates if the percentage of criminogenic needs is predictive of recidivism while controlling for sex, race, age, sex offender status, drug problems, assaultive behavior, and risk.[33]

For Model 1, sex, drug problems, assaultive behavior and risk were all statistically significant predictors of technical violations and in the expected direction. Specifically, being male, having a drug problem, exhibiting assaultive behavior, and being higher risk were all found to be related to technical violations. However, the percentage of criminogenic need targets was not shown to be a predictor of technical violations. When examining the odds ratios, having a drug problem increases the odds of a technical violation 1.7 times in comparison with those who do not have a drug problem. Exhibiting assaultive behavior increases the odds of a

[33] The Appendix contains the full multivariate logistic regression models. See Tables A55 through A58.

technical violation occurring 1.3 times. Being moderate or high risk increases the odds of a technical violation by 1.6 and 2.1 times respectfully.

Model 2 displays the regression analysis results examining the impact of the percentage of criminogenic targets on arrest. Three variables were found to be predictive of arrest, including sex, age, and risk which was similar to the regression model looking at the effect of non-criminogenic needs and arrest. The percentage of criminogenic targets was not a statistically significant predictor of arrest. As such, being male, being young, and being at higher risk were all predictors of arrest. Moderate to high risk offenders are more likely to experience an arrest and their odds increase by 1.6 and 2.0 times respectfully.

Model 3 displays the regression findings for evaluating the impact of the percentage of criminogenic need targets on incarceration. Sex, drug problems, assaultive behavior, and risk, were the four statistically significant predictors of incarceration and all were found in the expected direction. The percentage of criminogenic need targets did not have a significant impact on incarceration. Specifically, being male, having a drug problem, exhibiting assaultive behavior, and being higher risk were all found to be related to incarceration. When examining the odds ratios, having a drug problem increases the odds of incarceration 1.7 times in comparison with those who do not have a drug problem. Offenders who display assaultive behavior are 1.2 times more likely to be incarcerated. Being moderate or high risk increases the odds of an incarceration by 1.7 and 2.2 times respectfully.

Model 4 displays the regression model findings evaluating the impact of the percentage of criminogenic need targets on any recidivism. Sex, age, drug problems, and risk were all statistically significant predictors of any recidivism. However, exposure to a greater percentage of criminogenic need targets was not a significant predictor of any recidivism. Being male,

being young, having a drug problem and being higher risk, were all found to be related to any recidivism. When examining the odds ratios, having a drug problem increases the odds of recidivism 1.5 times in comparison with those who do not have a drug problem. Being moderate or high risk increases the odds of any recidivism by 1.8 and 2.3 times respectfully.

Table 45. Recidivism Predicted by Criminogenic Need Targets (N=3281)

	Tech Violation[a]		Arrest[b]		Incarceration[c]		Any Recidivism[d]	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.712**	.491	-.522*	.593	-.709**	.492	-.669**	.512
Race	.055	1.056	-.158	.854	.085	1.089	.052	1.053
Age	-.009	.991	-.025**	.976	-.009	.991	-.012*	.988
Sex Off.	.331	1.393	-.411	.663	.308	1.360	.091	1.096
Drug	.512**	1.669	.237	1.267	.514**	1.672	.440**	1.553
Assault	.232*	1.261	.050	1.052	.215*	1.240	.147	1.158
Low- ref.								
Moderate	.484**	1.622	.448**	1.565	.511**	1.667	.571**	1.770
High	.746**	2.108	.672**	1.958	.767**	2.153	.821**	2.272
% Crim	-.004	.996	-.001	.999	-.004	.996	-.004	.996
Constant	-.346	.707	-.484	.616	-.328	.720	.078	1.082

[a] Model x^2=170.510, -2 Log Likelihood=4374.030, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01
[b] Model x^2=107.833, -2 Log Likelihood=3846.137, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01
[c] Model x^2=104.896, -2 Log Likelihood=2610.843, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01
[d] Model x^2=167.977, -2 Log Likelihood=4343.261, Pseudo R^2= .050 to .067, **p≤.001, *p≤.01

Research Question Three Summary

The third research question addressed in this dissertation indicates that with this sample, the finding with the most relevance was related to the exposure of non-criminogenic targets. In particular, the bivariate analyses indicated that for moderate risk offenders only, increased exposure to non-criminogenic needs was significantly associated with incarceration and any recidivism. Within the regression analysis, increases in non-criminogenic need targets were found to be a significant predictor of technical violations, arrests, and incarceration, but not any recidivism. Each of the regression analyses evaluating the impact of criminogenic targets on recidivism did not result in a significant relationship between the increase of criminogenic needs

and technical violations, arrests, incarceration, and any recidivism. The common statistically significant indicator across all of the regression models was that risk level based on the LSI-R risk and needs assessment remained a statistically significant predictor for all four measures of recidivism.

Research Question Four

Research Question four builds upon the information gleaned from Research Question three. Based on the results for this sample, the findings from Research Question three suggest that the total number or percentage of criminogenic need targets did not appear to have much of an impact on recidivism. This is quite relevant in the sense that in reviewing the number and percent of offenders who were exposed to particular criminogenic need targets (see Table 37) the three most common targets were for vocational achievement (85%), alcohol and drug (75%), and education (70%). Perhaps what might be a more relevant question to ask is if the focus for addressing risk to recidivate should be on what is being targeted, rather than how many needs are targeted?

Specifically, this research question seeks to identify if there are combinations of criminogenic needs that are more predictive of recidivism reductions and whether or not this differs by risk level. Prior research has indicated that specific or primary criminogenic needs, such as antisocial attitudes, antisocial peers, and characteristics of antisocial personality are strong predictors of recidivism and while targets such as substance abuse, employment, and education are criminogenic risk factors, they are rather secondary to these three primary criminogenic needs (Andrews and Bonta, 1994, 2006; Simourd and Andrews, 1994).

Based on this prior research, five of the primary and secondary criminogenic needs were pulled from the 19 criminogenic need targets described in the findings section from Research Question 3. These were selected from Table 37 as each represents the most frequently targeted criminogenic needs. These two categories and the percentage of offenders who were exposed to these criminogenic needs are as follows:

Primary Criminogenic Needs:

- anger/hostility level – 62.6%
- attitudes, orientations and values favorable to law violations – 57.6%
- antisocial peer associations – 38.1%
- self-control, self-management, and problem solving skills – 28.4%
- skills of lying, stealing, and aggression – 14.7%

Secondary Criminogenic Needs:

- vocational achievement – 85.0%
- problems associated with alcohol/drug abuse – 75.4%
- educational achievement – 69.8%
- relapse prevention – 62.2%
- family problem solving – 41.4%

Based on these percentages above, most of the offenders were exposed to targets that fell into the secondary criminogenic need category. The largest percentage of primary criminogenic needs targeted was for anger and hostility at nearly 63% followed by attitudes at nearly 58%. Within the secondary criminogenic needs category, 85% of the offenders in this sample were placed in programs that addressed vocational achievement, followed by 75% being exposed to targets related to problems with alcohol and drugs. Based on these percentages, the targets for this sample were more frequently found within the secondary criminogenic needs category.

Crosstabulations and Bivariate Analysis

Primary and Secondary Needs with Recidivism

Each of these two sets of criminogenic needs, primary and secondary, were then separated into two scales, called 'Primary Needs' and 'Secondary Needs'. In Table 46, there are four sets of crosstabulation models that describe the recidivism rates for each scale. It should be noted that the sample size was reduced to 3217 cases as there were 64 cases that did not have at least one of the five items targeted for at least one scale. These crosstabulation models present the recidivism rates by the total number of primary and secondary criminogenic needs targeted.

The first crosstabulation model shows the technical violation rates by the primary and secondary scales. Further, the total number of cases that had a technical violation and the overall technical violation rate are presented. It is important to consider the overall technical violation rate of 48% when interpreting these results. Looking at the primary scale, the lowest recidivism rate is nearly 43% for when there are five primary criminogenic needs targeted. When reviewing the secondary scale, only when there is just 1 or just 3 needs targeted does the technical violation rate fall below that of the overall 48.3%. However, when targeting all five, the arrest rate was at nearly 52%.

The second crosstabulation model presents the arrest rates for the primary and secondary scales. The overall arrest rate is 29.2%. When targeting just one need from each scale, there is a reduction in arrest rates. For the primary scale, the largest arrest rate reductions come when all five primary criminogenic needs are being targeted at 25%. When four or five of the secondary criminogenic needs are targeted, the arrest rate climbs to 31.2%.

For the third crosstabulation model, the overall incarceration rate is 49.1%. Within the primary scale, when all five needs are targeted, the incarceration rate decreased to 43.6%. For

the secondary scale, targeting all five secondary needs increased the incarceration rate to almost 52%. The lowest rate for incarceration was observed within the secondary scale was when only one need was targeted, and the rate was reported at 40.7%.

The overall recidivism rate was 55.4%. The rates were lower within the primary scale when 1, 4 or 5 primary needs were targeted. When all five primary needs were targeted, the recidivism rate was 51.5%. The recidivism rate within the secondary scale increased to 58.5% when all five secondary needs were being targeted. When just one secondary scale need was targeted, the recidivism rate was 47%.

Table 46. Recidivism Rates by Primary and Secondary Scales (N=3217)

Number Targets	Primary		Secondary	
	Technical Violations (N=3217)			
	N	%	N	%
1	514	45.0	57	40.7
2	318	52.6	321	49.8
3	451	51.7	345	44.6
4	185	47.1	541	49.4
5	87	42.6	291	51.6
Total	1555	48.3	1555	48.3
	Arrest (N=3217)			
	N	%	N	%
1	327	28.6	34	24.3
2	178	29.4	193	30.0
3	262	30.0	194	25.1
4	121	30.8	342	31.2
5	51	25.0	176	31.2
Total	939	29.2	939	29.2
	Incarceration (N=3217)			
	N	%	N	%
1	521	45.6	57	40.7
2	324	53.6	329	51.1
3	459	52.6	350	45.3
4	187	47.6	552	50.4
5	89	43.6	292	51.8
Total	1580	49.1	1580	49.1
	Any Recidivism (N=3217)			
	N	%	N	%
1	602	52.7	66	47.1
2	351	58.0	372	57.8
3	517	59.3	405	52.4
4	207	52.7	609	55.6
5	105	51.5	330	58.5
Total	1782	55.4	1782	55.4

These four crosstabulation models above are unique for this sample as the primary and secondary measures are also a reflection of the targets that were most commonly observed for this sample, meaning they represent practice. Most of the offenders were directed to programs that had targets that fell within the secondary criminogenic need category. As a result, many of these offenders were frequently exposed to these targets. When all five secondary criminogenic

needs were targeted, the recidivism rates were consistently higher than the overall for each measure of recidivism. When examining the primary criminogenic needs scale – comprised of what research indicates are the strongest predictors of recidivism – the recidivism rates are consistently lowest when targeting all five.

Primary and Secondary Needs and Recidivism by Risk Level

The next step to respond to this research question is to examine if these two scales, the primary and secondary scales, reveal any differences in the four recidivism rates by risk level. Tables 47 through 49 provide the rates of recidivism for each scale by risk level. The tables below are organized by risk level. Due to these tables presenting just the recidivism rates, within the column labeled 'Number Targets' the total number of offenders for the primary scale and secondary scale are provided. The total number of offenders for the primary scale is listed first followed by the total number of offenders for the secondary scale. For example, in Table 47 below, this reads as (P=294, S=47) when one criminogenic need is targeted for each separate scale. The P=294 indicates that were 294 offenders who had just one criminogenic need within the primary scale targeted. For the secondary scale, there were 47 offenders who had just one secondary criminogenic need targeted.

Table 47 presents the recidivism rates for the low risk group (N=850). For technical violations, the overall technical violation rate was 36.2%. There is a slight decrease in the technical violation rate for the primary scale when all five primary criminogenic needs are targeted. The secondary scale revealed a slight increase to 36.5% when all five secondary criminogenic needs were targeted.

As displayed in Table 47, the overall arrest rate was 20.7%. Both the primary and secondary scales had a slight increase in the arrest rate when all five criminogenic needs within

each scale were targeted. The overall incarceration rate was 36.5%. Both the primary and secondary scales had slight decreases in the incarceration rates when all five needs within each scale were targeted. Finally, the overall recidivism rate of 41.8% and the recidivism rate increased to 47.2% when all five primary criminogenic needs were targeted in the primary scale and increased to just 42.3% when all five secondary criminogenic needs were targeted within this scale.

Table 47. Recidivism Rates by Primary and Secondary Scales Low Risk (N=850)

Number Targets	Primary		Secondary	
	Technical Violation Rates			
	N	%	N	%
1 (P=294, S=47)	87	29.6	17	36.2
2 (P=188, S=165)	81	43.1	60	36.4
3 (P=214, S=227)	83	38.8	77	33.9
4 (P=101, S=255)	38	37.6	97	38.0
5 (P=53, S=156)	19	35.8	57	36.5
Total	308	36.2	308	36.2
	Arrest Rates			
	N	%	N	%
1 (P=294, S=47)	58	19.7	12	25.5
2 (P=188, S=165)	43	22.9	36	21.8
3 (P=214, S=227)	40	18.7	38	16.7
4 (P=101, S=255)	24	23.8	57	22.4
5 (P=53, S=156)	11	20.8	33	21.2
Total	176	20.7	176	20.7
	Incarceration Rates			
	N	%	N	%
1 (P=294, S=47)	89	30.3	17	36.2
2 (P=188, S=165)	81	43.1	63	38.2
3 (P=214, S=227)	84	39.3	77	33.9
4 (P=101, S=255)	38	37.6	97	38.0
5 (P=53, S=156)	19	35.8	57	36.5
Total	311	36.6	311	36.6
	Any Recidivism Rates			
	N	%	N	%
1 (P=294, S=47)	105	35.7	22	46.8
2 (P=188, S=165)	87	46.3	74	44.8
3 (P=214, S=227)	96	44.9	88	38.8
4 (P=101, S=255)	42	41.6	105	41.2
5 (P=53, S=156)	25	47.2	66	42.3
Total	355	41.8	355	41.8

Table 48 provides the recidivism rates for moderate risk offenders. There were a total of 1382 moderate risk offenders. The overall technical violation rate was 49.6%. When all five criminogenic needs are targeted in the primary scale, the technical violation rate was 36.7%, which is approximately a 13% percentage point difference. For the secondary scale, when all five secondary criminogenic needs are targeted, the technical violation rate was 56%, indicating that

nearly 6% more offenders had a technical violation when all five secondary criminogenic needs were targeted.

As displayed below, the arrest rates differed when all five needs were addressed in each separate scale. The overall arrest rate for moderate risk offenders was 30.4. When all five needs were addressed in the primary scale, the rate dropped to 17.8%. Within the secondary scale, the arrest rate increased to 34.4%. These results should be cautiously interpreted given that fewer offenders received five primary criminogenic needs.

Table 48 also presents the incarceration rates by the primary and secondary scales. The overall incarceration rate was 50.7% for moderate risk offenders. For moderate risk who received all five primary criminogenic needs the incarceration rate was 37.8%, so nearly a 13% percentage point difference. Offenders who received all five secondary criminogenic needs had an incarceration rate of 56.5%, which is approximately a 6% higher rate.

When all five primary criminogenic needs were targeted, about 45.6% of the moderate risk group recidivated. The overall recidivism rate for moderate risk offenders was 57.6%, so the difference for the moderate risk offenders who had all five primary needs targeted was 12%. For the moderate risk offenders who had five secondary criminogenic needs targeted, the recidivism rate was 63.4%, so almost a 6% higher recidivism rate than the overall was observed when all five secondary needs were targeted.

Table 48. Recidivism Rates by Primary and Secondary Scales Moderate Risk (N=1382)

Number Targets	Primary		Secondary	
	Technical Violation Rates			
	N	%	N	%
1(P=505, S=58)	237	46.9	19	32.8
2 (P=245, S=271)	133	54.3	139	51.3
3 (P=356, S=325)	187	52.5	143	44.0
4 (P=186, S=496)	96	51.6	255	51.4
5 (P=90, S=232)	33	36.7	130	56.0
Total	686	49.6	686	49.6
	Arrest Rates			
	N	%	N	%
1(P=505, S=58)	149	29.5	13	22.4
2 (P=245, S=271)	73	29.8	82	30.3
3 (P=356, S=325)	114	32.0	76	23.4
4 (P=186, S=496)	68	36.6	170	34.3
5 (P=90, S=232)	16	17.8	79	34.1
Total	420	30.4	420	30.4
	Incarceration Rates			
	N	%	N	%
1(P=505, S=58)	240	47.5	19	32.8
2 (P=245, S=271)	139	56.7	144	53.1
3 (P=356, S=325)	190	53.4	145	44.6
4 (P=186, S=496)	97	52.2	261	52.6
5 (P=90, S=232)	34	37.8	131	56.5
Total	700	50.7	700	50.7
	Any Recidivism Rates			
	N	%	N	%
1(P=505, S=58)	275	54.5	23	39.7
2 (P=245, S=271)	151	61.6	159	58.7
3 (P=356, S=325)	219	61.5	171	52.6
4 (P=186, S=496)	110	59.1	296	59.7
5 (P=90, S=232)	41	45.6	147	63.4
Total	796	57.6	796	57.6

Table 49 indicates that there was not much improvement in reducing technical violations, arrests, incarceration or any recidivism for any of the 985 high risk offenders when either five of the primary or five of the secondary needs were targeted. However, upon examination of four criminogenic targets within the primary and secondary scales, reductions in recidivism were observed for each of the four outcome types.

The first crosstabulation model in Table 49 presents the technical violation recidivism rates for the high risk offender group for the primary and secondary criminogenic need scales. The overall technical violation rate was 57%. When four primary criminogenic needs are targeted, the recidivism rate was 48.1%. For the secondary needs group, when four needs are targeted, the recidivism rate was 54.8%.

For the second crosstabulation model, the overall arrest rate was 34.8%. For both scales, when the five needs were targeted, the arrest rates were higher than the overall. However, when four primary criminogenic needs are targeted, the arrest rate was 27.4%. For the secondary needs group, when four needs are targeted, the arrest rate was 33.3%.

In the third model, the overall incarceration rate was 57.8%. For both scales, when the five needs were targeted, the incarceration rates were slightly higher than the overall, 59% for both scales. However, when four primary criminogenic needs are targeted, the incarceration rate was 49.1%. For the secondary needs group, when four needs are targeted, the recidivism rate was 56.2%.

Finally, the overall recidivism rate was 64.1%. When four primary criminogenic needs are targeted, the recidivism rate was 51.9%. For the secondary needs group, when four needs are targeted, the recidivism rate was 60.3%.

Table 49. Recidivism Rates by Primary and Secondary Scales High Risk (N=985)

Number Targets	Primary		Secondary	
	Technical Violation Rates			
	N	%	N	%
1 (P=344, S=35)	190	55.2	21	60.0
2 (P=172, S=208)	104	60.5	122	58.7
3 (P=302, S=221)	181	59.9	125	56.6
4 (P=106, S=345)	51	48.1	189	54.8
5 (P=61, S=176)	35	57.4	104	59.1
Total	561	57.0	561	57.0
	Arrest Rates			
	N	%	N	%
1 (P=344, S=35)	120	34.9	9	25.7
2 (P=172, S=208)	62	36.0	75	36.1
3 (P=302, S=221)	108	35.8	80	36.2
4 (P=106, S=345)	29	27.4	115	33.3
5 (P=61, S=176)	24	39.3	64	36.4
Total	343	34.8	343	34.8
	Incarceration Rates			
	N	%	N	%
1 (P=344, S=35)	192	55.8	21	60.0
2 (P=172, S=208)	104	60.5	122	58.7
3 (P=302, S=221)	185	61.3	128	57.9
4 (P=106, S=345)	52	49.1	194	56.2
5 (P=61, S=176)	36	59.0	104	59.1
Total	569	57.8	569	57.8
	Any Recidivism Rates			
	N	%	N	%
1 (P=344, S=35)	222	64.5	21	60.0
2 (P=172, S=208)	113	65.7	139	66.8
3 (P=302, S=221)	202	66.9	146	66.1
4 (P=106, S=345)	55	51.9	208	60.3
5 (P=61, S=176)	39	63.9	117	66.5
Total	631	64.1	631	64.1

In sum, these crosstabulations indicate that targeting the primary criminogenic needs rather than just focusing on the secondary need areas produced lower recidivism rates for the moderate risk group when all five primary criminogenic needs were being targeted. For the higher risk group, targeting five needs in both the primary or secondary need scales did not have an impact in producing a lower recidivism rate than the overall rates for each outcome type.

However, it was observed that when four primary criminogenic needs were targeted, reductions in recidivism for the high risk group were observed from 7.4 to 12.2%.

Primary and Secondary Needs with Recidivism

The next set of analyses present the bivariate correlations for the total sample and by risk for the primary and secondary scales. Table 50 presents the bivariate correlations for the primary and secondary scales by risk level. Starting with the low risk group, no correlations were found to be statistically significant. This aligns with the crosstabulation tables describing the recidivism rates for the low risk group as not much of an impact was observed when examining whether the five primary criminogenic needs or secondary needs had lower recidivism rates than the overall. Regarding the moderate risk group (N=1382), several of these correlations within the secondary scale are significant, but the relationship with recidivism is an inverse relationship. With these correlations, increases in the number of secondary criminogenic needs targeted was significantly associated with increases in recidivism. For the primary scale, while the direction is negative, meaning as there is an increase in primary needs targeted this would be associated with a decrease in recidivism, none of these correlations were statistically significant and all are rather weak in terms of strength. The last set of correlations examines the bivariate correlations with both scales with each of the four measures of recidivism for the high risk group (N=985). No findings were statistically significant and each of these correlations was relatively weak despite their negative direction.

Table 50. Bivariate Correlations for Primary and Secondary Scales by Risk Level

Scale	Technical Violation	Arrest	Incarceration	Any Recidivism
	Low Risk (N=850)			
Primary	.054	.011	.050	.063
Secondary	.012	-.002	.003	-.020
	Moderate Risk (N=1382)			
Primary	-.004	-.001	-.004	.004
Secondary	.070**	.065*	.066*	.073*
	High Risk (N=985)			
Primary	-.005	-.009	-.002	-.033
Secondary	-.010	.008	-.007	-.014

**p≤.01, *p≤.05

Multivariate Regression Analysis

This last set of regression models present the results of the multivariate analyses to identify if this combination of criminogenic needs (primary and secondary) has an impact on recidivism while controlling for sex, race, age, risk, sex offender status, having a drug problem, or concerns related to assaultive behavior. The eight logistic regression models are organized by recidivism type and by primary and secondary criminogenic needs scale within Table 51.[34] To properly interpret Table 51, the following model labels were used: Models 1 through 4 examine recidivism with the primary scale and Models 5 through 8 examine recidivism with the secondary scale. For example, Model 1 refers to the regression analysis predicting technical violations with the primary criminogenic needs scale. Model 5 refers to the regression analysis predicting technical violations with the secondary criminogenic needs scale. Each section below is organized by recidivism type.

Technical Violations Predicted by Primary and Secondary Need Scales

Table 51 displays the regression analysis results predicting technical violations with the primary and secondary criminogenic need scales within Models 1 and 5 respectfully. Model 1

[34] The Appendix contains the full multivariate logistic regression models. See Tables A60 through A67.

displays the findings from the regression model to examine if the primary scale had an impact on technical violations. The statistically significant predictors of technical violations noted from this model include sex, drug problems, assaultive behavior, risk, and the primary scale. Specifically, males are significantly more likely than females to experience a technical violation. Offenders with drug problems are significantly more likely to have a technical violation, nearly 1.7 times than offenders without drug problems. The odds of a technical violation increases 1.2 times for offenders who exhibit assaultive behavior than those who do not present with this concern. Moderate and higher risk offenders were significantly more likely to have a technical violation, with an increased odds of 1.6 and 2.1 times respectfully. When two or three needs are targeted on the primary scale, the odds of a technical violation were found to significantly increase; however, once four and five needs were targeted, the relationship was no longer significant.

In Table 51, Model 5 provides the regression model results to test if the secondary scale had an impact on technical violations. The statistically significant predictors of technical violation observed within this model include sex, drug problems, assaultive behavior, and risk. The secondary criminogenic needs scale was not found to be a predictor of technical violations. The findings indicate that males are significantly more likely than females to experience a technical violation. Offenders with drug problems are significantly more likely to have a technical violation, with an increased odds of 1.7 times in comparison to offenders without drug problems. The odds of a technical violation increases 1.3 times for offenders who exhibit assaultive behavior than those who have not displayed violence. Moderate and higher risk offenders were significantly more likely to experience a technical violation, with an increased odds of 1.6 for moderate risk and 2.1 times for high risk.

Arrest Predicted by Primary and Secondary Need Scales

Table 51 displays the regression analysis results predicting arrest with the primary and secondary criminogenic need scales within Models 2 and 6. Model 2 provides the regression model results to examine if the primary scale had an effect on arrests. There were only two statistically significant predictors of arrests, age and risk. The primary criminogenic needs scale was not found to be a predictor of arrests. The results indicate that younger offenders are significantly more likely to be arrested as well as moderate to high risk offenders. The odds of a new arrest increased for moderate and higher risk offenders 1.6 times and 2.0 times respectfully.

Model 6 illustrates the findings from the logistic regression model that tested if the secondary criminogenic needs scale had an effect on arrests. The secondary criminogenic needs scale was not found to be a predictor of arrests. The results indicate that younger offenders are significantly more likely to be arrested as well as moderate to high risk offenders. Similar to Model 2, the odds of a new arrest increased 1.6 times for moderate risk and 2.0 times for higher risk offenders.

Incarceration Predicted by Primary and Secondary Need Scales

Table 51 depicts the findings from the regression analysis predicting incarceration with the primary and secondary criminogenic need scales found within Models 3 and 7. Model 3 presents the findings from the regression model to examine if the primary scale had an impact on incarceration. The statistically significant predictors of incarceration observed in this model include sex, drug problems, risk, and the primary scale. Specifically, males are significantly more likely than females to experience incarceration. Offenders with drug problems are significantly more likely to be incarcerated, nearly 1.7 times that of offenders without drug problems. Moderate and higher risk offenders were significantly more likely to be incarcerated, with an increased odds of 1.7 and 2.2 times respectfully. When two or three needs are targeted

on the primary scale, the odds of incarceration were found to significantly increase; however, once four and five needs were targeted, the relationship was no longer significant.

Model 7 displays the findings from the regression model that examined if the secondary criminogenic needs scale had an impact on incarceration. There were three statistically significant predictors of incarceration that emerged in this model, including sex, drug problems, and risk. The secondary criminogenic needs scale was not found to be a predictor of incarceration. The odds of incarceration increased 1.6 times for moderate risk offenders and 2.2 times for higher risk offenders. Offenders presenting with drug problems was also found to be significant predictor of incarceration, with the odds of an incarceration increasing 1.7 times in comparison to those without a drug problem.

Any Recidivism Predicted by Primary and Secondary Need Scales

The last two models in Table 51, reveal the logistic regression model findings examining if the primary and secondary criminogenic need scales predict any recidivism. In Model 4, the statistically significant predictors of recidivism identified were sex, age, drug problems, risk, and the primary criminogenic needs scale. In particular, males are significantly more likely than females to recidivate. Younger offenders were also significantly more likely to recidivate than older offenders. Offenders with drug problems were significantly more likely to recidivate, nearly 1.6 times that of offenders without drug problems. Moderate and higher risk offenders were significantly more likely to be recidivate, with an increased odds of 1.8 for moderate risk and 2.3 times for high risk. When two or three needs are targeted on the primary scale, the odds of recidivism were found to significantly increase; however, once four and five needs were targeted, the relationship was no longer significant.

Model 8 displays the regression model results that evaluated if the secondary scale had an effect on recidivism. There were three statistically significant predictors of recidivism observed within this model including sex, drug problems, and risk. The secondary criminogenic needs scale was not found to be a predictor of recidivism. The odds of recidivism increased for moderate and higher risk offenders, nearly 1.8 times and 2.3 times respectfully. Offenders presenting with drug problems was also found to be significant predictor of recidivism, with the odds of a recidivism increasing 1.6 times in comparison to those without a drug problem.

Table 51. Recidivism Predicted by Primary and Secondary Scales (N=3217)

Primary	Tech Violation[a,e]		Arrest[b,f]		Incarceration[c,g]		Any Recidivism[d,h]	
Variable	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.634**	.530	-.477	.621	-.628**	.534	-.577**	.562
Race	.065	1.067	-.151	.860	.097	1.102	.058	1.059
Age	-.009	.991	-.025**	.975	-.009	.991	-.012*	.988
Sex Off.	.334	1.397	-.413	.661	.312	1.367	.100	1.105
Drug	.518**	1.678	.231	1.260	.521**	1.683	.454**	1.575
Assault	.221*	1.248	.047	1.048	.204	1.226	.134	1.144
Low- ref.								
Moderate	.484**	1.623	.448**	1.566	.514**	1.672	.578**	1.783
High	.765**	2.148	.689**	1.991	.787**	2.198	.844**	2.326
Pri.1-ref								
Primary 2	.379**	1.460	.111	1.117	.397**	1.488	.296*	1.345
Primary 3	.313**	1.367	.112	1.118	.324**	1.383	.312**	1.366
Primary 4	.090	1.094	.104	1.109	.092	1.097	.009	1.010
Primary 5	.012	1.013	-.109	.897	.027	1.027	.050	1.051
Constant	-.901	.406	-.592	.553	-.892	.410	-.415	.660
Second.	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Sex	-.582**	.559	-.456	.634	-.568**	.567	-.533**	.587
Race	.080	1.083	-.146	.864	.111	1.117	.076	1.079
Age	-.008	.992	-.025**	.976	-.008	.992	-.011*	.989
Sex Off.	.320	1.377	-.386	.680	.308	1.361	.072	1.075
Drug	.519**	1.680	.234	1.263	.521**	1.684	.451**	1.569
Assault	.224*	1.251	.049	1.050	.208	1.231	.135	1.145
Low- ref.								
Moderate	.469**	1.598	.440**	1.553	.496**	1.642	.568**	1.765
High	.752**	2.122	.680**	1.973	.772**	2.165	.840**	2.317
Sec. 1-ref								
Second 2	.189	1.208	.068	1.070	.242	1.274	.235	1.265
Second 3	-.022	.979	-.149	.862	.011	1.011	.034	1.035
Second 4	.107	1.113	.085	1.089	.154	1.166	.087	1.091
Second 5	.222	1.249	.131	1.140	.238	1.269	.252	1.287
Constant	-.886	.412	-.584	.558	-.912	.402	-.442	.643

[a] Model x^2=181.205, -2 Log Likelihood=4274.945, Pseudo R^2= .055 to .073, **p≤.001, *p≤.01
[b] Model x^2=108.918, -2 Log Likelihood=3776.140, Pseudo R^2= .033 to .047, **p≤.001, *p≤.01
[c] Model x^2=185.117, -2 Log Likelihood=4273.582, Pseudo R^2= .056 to .075, **p≤.001, *p≤.01
[d] Model x^2=177.155, -2 Log Likelihood=4245.052, Pseudo R^2= .054 to .072, **p≤.001, *p≤.01
[e] Model x^2=167.504, -2 Log Likelihood=4288.645, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01
[f] Model x^2=112.766, -2 Log Likelihood=3772.292, Pseudo R^2= .034 to .049, **p≤.001, *p≤.01
[g] Model x^2=170.227, -2 Log Likelihood=4288.472, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01
[h] Model x^2=166.955, -2 Log Likelihood=4255.212, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01

Research Question Four Summary

Research Question four provided some evidence that supports previous research related to targeting the strongest dynamic risk factors, or criminogenic needs, to reduce the likelihood of recidivism. In particular, within this sample, targeting antisocial attitudes, antisocial peers, and characteristics of antisocial personality revealed reductions in recidivism for moderate risk offenders and high risk offenders. There did not appear to be much of an impact on low risk offenders when it came to targeting criminogenic needs. Perhaps this is not surprising as by definition, low risk would also suggest fewer dynamic risk factors. The bivariate and multivariate models indicate that caution should be taken when interpreting these results however, as it was not possible to confirm if the relationships observed within the multivariate models indicate that when targeting the primary criminogenic needs, that the impact of reducing recidivism was achieved when targeting at least four to five dynamic risk factors. Yet, the results related to the secondary scale – which focused on secondary criminogenic needs related to work, education, and substance abuse, were not collectively reducing the odds of technical violations, arrests, incarceration, and any recidivism. What was noted however with this sample is that the targets that offenders were more frequently exposed to were intended to address these secondary criminogenic needs. Once offenders were exposed to five of these targets, recidivism rates were occasionally observed to increase.

The next chapter that follows in this dissertation will provide a summary of the results, a thorough description of this study's limitations, a discussion of the practical implications for these results and proposed next steps for research.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

Effective correctional programming centers on the ability for a program to properly implement the principles of effective intervention and empirically demonstrate a treatment effect that yields recidivism reductions for the program participants (Andrews, 1995; Gendreau, 1996). Cullen and Gendreau (2000) succinctly defined these four principles of effective programming to include: (1) Target the primary risk factors for offending behavior with a focus on antisocial attitudes, antisocial peers, and antisocial personality; (2) Apply behavioral approaches, such as modeling, reinforcement, extinction, and graduated rehearsal; (3) Target interventions toward higher risk offenders and ensure the necessary dosage of cognitive approaches in the range of three to nine months of programming; (4) Apply several strategies to increase treatment effectiveness such as adopting a quality assurance process, integrating a system of aftercare and relapse prevention, and ensure that staff are well trained and supportive of the treatment model.

The focus of this study was to offer additional empirical insight into the principles of effective programming related to targeting the primary risk factors or strongest predictors of offending, the dosage and intensity of programming, and the use of cognitive approaches including modeling, role playing, and application of core correctional practices.

The final chapter is organized into four sections starting with a summary of the major findings, a description of the study's limitations, a discussion of practical implications, and recommendations for future research.

Findings Summary

Within the context of this study's limitations – a section that will be addressed next – there were several findings that emerged from each research question posed that will be briefly highlighted.

Dosage

The first research question raised in this dissertation focused on identifying the dosage of treatment that is appropriate to reduce the risk of recidivism by level of risk (low, moderate, and high). Program length, which was categorized into three groups, 1 to 3 months, 4 to 6 months, and 7 or more months revealed several statistically significant relationships in terms of reducing the likelihood of technical violations, arrests, incarceration, and any recidivism. In particular, the odds of recidivism decreased across all four recidivism outcomes within the 4 to 6 month category. Seven or more months of programming did yield a statistically significant relationship with three measures of recidivism, technical violations, incarcerations and any recidivism, but failed to produce significant results related to arrest. Both high and low risk offenders were found to have reduced recidivism rates as programming length increased. Specifically, when moving from 1 to 3 months to 7 or more months, higher risk offenders were found to have reduced recidivism more than 10% for each outcome measure and up to 20% for any recidivism. These results provide some additional support related to dosage as measured by program length lasting between three to nine months (Andrews, 1995; Gendreau, 1996, Cullen and Gendreau, 2000).

As mentioned above, low risk offenders were also found to benefit in terms of reducing recidivism rates for each of the four outcome measures when program length was increased. It is

important to note that these rates of recidivism were still higher than the rates observed by members of the matched low risk comparison group in the original halfway house study. As such, these results should not be interpreted as an endorsement to extend programming dosage for low risk offenders. It is expected that the rates of recidivism were still higher for the low risk group due to mixing this group with higher risk offenders in the program settings. Decades of research has consistently shown that low risk offenders often experience higher rates of recidivism when subjected to interventions intended for higher risk offenders (Andrews et al., 1990; Andrews and Dowden, 2006; Dowden and Andrews, 1999a, 1999b, 2000; Lipsey and Wilson, 1998; Lowenkamp, Latessa and Holsinger, 2006; Lowenkamp and Latessa, 2002, 2004; Lowenkamp, Smith and Bechtel, 2007; Latessa, Lowenkamp, and Bechtel, 2008).

This research question also examined dosage as measured by group hours and the findings were significant, but not in the expected direction. Specifically, the total group hours category of 200+ hours revealed a statistically significant relationship with several recidivism measures, technical violation, incarceration, and any recidivism. Increases in recidivism were observed for 200 or more hours of programming, but these results dissipated when the interaction between group hours and risk were added to the regression models. These findings differed from other research measuring hours of programming and recidivism (Bourgon and Armstrong, 2005; Sperber et al., 2013b, Makarios et al., 2014).

Modeling, Role Playing, and Core Correctional Practices

The second research question posed within this dissertation looked at the impact of modeling, role playing, and the use of core correctional practices on recidivism. Related to modeling and role playing, prior research has identified that both of these techniques are characteristics of

effective programs. Specifically, Antonowicz and Ross (1994) identified components of successful programs, and two of these characteristics included frequent use of modeling and role playing to address an offender's antisocial cognitions and behaviors and integrating social skills training for offenders. Recently, Sperber and Lowenkamp (2016) found that the use of role playing within a halfway house setting produced a statistically significant impact on moderate to high risk offenders. Specifically, moderate risk offenders who were exposed to 0 to .49 role plays per week to 3 or more role plays per week were found to have a 25% reduction in recidivism. For high risk offenders, the reduction in recidivism was over 50% when moving from 0 to .49 role plays per week to 3 or more role plays per week.

For the current study, with the exception of one analysis, modeling and role playing did not have an impact on recidivism. The one exception to this was observed when examining the relationship for modeling and arrests for the total group exposed to modeling (N=1667) and for moderate risk offenders. The percentage of time modeling was significantly and inversely correlated with arrest for the total group and for moderate risk offenders. As the percentage of time spent on modeling increased, there was a decrease in arrests observed. However, these significant results dissipated within the multivariate models.

Research question two also evaluated if the use of core correctional practice skills, which integrates modeling and role playing within groups, had an effect on technical violations, arrests, incarcerations, and any recidivism. Both individual studies and meta-analyses have demonstrated that the use of core correctional practices produces reductions in recidivism within correctional program settings and community supervision (Bonta et al., 2010, Dowden and Andrews, 2004, Robinson et al., 2011). In the Dowden and Andrews (2004) meta-analysis,

programs that adhered to the principles of effective intervention and had staff proficiently applying core correctional programs were more effective in reducing recidivism.

For the current study, the bivariate analyses produced several interesting findings. In particular, when examining the relationship between core correctional practice skills and recidivism, it appears that when fewer steps are taken to properly complete effective reinforcement, effective disapproval, and effective use of authority, there were significant increases observed with technical violations, incarcerations, and any recidivism for the total sample. For the high risk offenders, these results were again observed. Specifically, when few core correctional practice skills were being utilized in the group setting (as based on the total CPAI-2000 group observation tool), there was a significant increase observed for any recidivism. These significant results dissipated within the multivariate regression models. While these results are not encouraging, they do provide empirical support to what Dowden and Andrews (2004) proclaimed regarding effective programs. Effective programs include staff who are proficient in their use of core correctional practice skills and the program should be adhering to the risk, need, and responsivity principles. Most of these group observations from the current study indicate that staff were not proficient in their understanding and application of core correctional practices and many of these program performed poorly in terms of adherence to the risk, need, responsivity models, based on most programs rating ineffective on the CPC.

The Impact of Criminogenic versus Non-Criminogenic Needs

Prior research has examined the relevance of targeting criminogenic and non-criminogenic needs and the impact of doing so. As part of their study on identifying effective program characteristics, Antonowicz and Ross (2004) noted that successful programs target

multiple criminogenic needs, adhere to the responsivity principle, and have a model that addresses a variety of offender characteristics. Further, Gendreau, French and Taylor (2002) found that multi-modal interventions that address four to six criminogenic needs rather than non-criminogenic needs result in reductions in recidivism. The third research question in the current study examined the impact of criminogenic versus non-criminogenic needs on recidivism.

With the sample examined in the current study, the relevant results were limited to understanding what the impact of non-criminogenic needs was on recidivism. Specifically, within the bivariate analyses, moderate risk offenders who had increased exposure to non-criminogenic needs were found to be significantly associated with incarceration and any recidivism. Within the regression analysis, increases in non-criminogenic need targets was found to be a significant predictor of technical violations, arrests, and incarceration, but not any recidivism and the odds of recidivism increased within each of these models when a greater percentage of group targets were non-criminogenic needs. Each of the regression analyses evaluating the impact of criminogenic targets on recidivism did not result in a significant relationship between the increase of criminogenic needs and technical violations, arrests, incarceration, and any recidivism. While prior research has repeatedly noted that increases in criminogenic need targets would reduce recidivism, with this sample, these findings were not replicated; however, this may be in part due to this sample of offenders having fairly high failure rates, poor programming, and exposure to non-criminogenic targets.

Impact of Criminogenic Need Program Targets

While Research Question three did not yield promising results with regard to criminogenic need group targets and recidivism, offenders were exposed to both primary (e.g.,

antisocial attitudes, antisocial peers, and antisocial personality) and secondary criminogenic needs (e.g., substance abuse, employment, education) as a result of participation in programming. The purpose of the fourth research question in this dissertation was to identify what the impact was, if any, on targeting primary and secondary criminogenic needs for this sample. This has important implications for practice since corrections and certainly within community supervision, secondary criminogenic needs such as employment, education, and substance abuse, often take priority as they are tied to supervision conditions and program targets.

Extensive research on criminogenic needs has been conducted (Andrews, Bonta, and Hoge, 1990; Gendreau, 1996; Andrews and Bonta, 1998). As part of the Big Four, the three dynamic criminogenic needs, antisocial attitudes, antisocial peers, and antisocial personality, have repeatedly been shown to be strong predictors of recidivism. Likewise, other criminogenic needs have been identified, including substance abuse, lack of employment, poor educational achievement, lack of structured and routine leisure and recreation, poor communication, and low family affection (Andrews and Bonta, 1994, 2006; Simourd and Andrews, 1994).

The findings observed from the analysis conducted to respond to Research Question four offers some empirical support to previous research. Specifically, within this sample, targeting antisocial attitudes, antisocial peers, and characteristics of antisocial personality revealed reductions in recidivism for moderate risk offenders and high risk offenders. Within the descriptive tables reporting recidivism rates for the primary and secondary needs scales, targeting five primary criminogenic needs was found to produce recidivism reductions of up to 10 percentage points. The opposite was observed for the secondary criminogenic needs scale as recidivism was occasionally observed to increase when targeting four to five secondary

criminogenic needs. Reductions in recidivism were not consistently observed for low risk offenders which may be in part due to the fact that they were low risk, and hence have fewer criminogenic needs, but also were mixed with higher risk offenders, which potentially could increase their likelihood to recidivate. As described previously, the bivariate and multivariate models suggest caution when interpreting the results as statistical significance was not consistently observed. Overall, the offenders in this sample were more frequently exposed to secondary criminogenic need targets rather than primary criminogenic needs, which was occasionally associated with increases in recidivism. These findings appear to mirror a study conducted by Zajac and Bucklen (2006) on Pennsylvania parolees. In particular, successful and unsuccessful parolees did not appear to differ in terms of addressing secondary criminogenic needs, such as finding housing or obtaining employment, rather the distinction appeared to be that unsuccessful parolees were revoked and returned to prison and often still maintained antisocial attitudes and beliefs and had poor problem solving and coping skills.

In sum, the notable findings from the current study offers additional support to prior research, but overwhelmingly the evidence from these data appears to indicate more insight into what perpetuates failure for offenders. A description of the study's limitations follows.

Study Limitations

Despite the findings that were produced from this research, it is important to consider these results within the context of the current study's limitations. These limitations are categorized into two primary areas – data and sample.

Data Limitations

Related to the data, there were multiple data sources used for the current study, but it was clear both in the original halfway house study evaluation and the current study, that missing data or inconsistently collected data resulted in extensive cleaning and coding, and occasionally information not being included in the analysis. A primary example of this was reducing the CPAI-2000 group observation data due to missing responses or confidence ratings that fell below the required moderate confidence rating of 3. Due to this, it is uncertain if the other observation forms had been completely filled out or perhaps filled out with higher confidence ratings if this would have produced more substantive results when examining the impact of modeling, role playing, and core correctional practices for the second research question. In terms of the completion of the CPAI-2000 group observation forms, the research teams varied for site visits to Pennsylvania and there was not a consistent effort to conduct inter-rater agreement tasks for when the observations were conducted in pairs. This is not to suggest unreliable completion of the group observation forms, but the potential for inconsistency should be, at a minimum, reported.

Regarding the analysis for criminogenic needs and non-criminogenic needs, this was based on data regarding what the group targets were, not necessarily what the needs were of each offender in this sample. The data available for offenders indicated overall LSI-R risk score and risk level, as well as indicators of substance abuse and assaultive behavior, but the criminogenic needs identified in the LSI-R were not included in the original data. While moderate and higher risk offenders based on the LSI-R would suggest the presence of criminogenic needs, it was not possible to identify for each offender in the sample which specific needs from the risk and needs

assessment should be targeted within a program setting. As such, this study did not look at the concept of matching an offender to a program based on their risk and needs, but rather if the group targets were sufficient to address offender risk. In addition to this, not all programs received full copies of the LSI-R risk and needs assessments for each offender referred to the program. Without the assessment information, programs were not able to consistently match an offender based on their specific risk and needs.

Modeling and role playing data were captured in the existing data, but certainly were not as refined as they ideally could be (See Sperber and Lowenkamp, 2016). Further, modeling and role playing data were based on two sources. The first was based on the reported measure of modeling and role playing within each group operated in a program and then based on observations from the CPAI-2000 group form. A clear example of the lack of refinement with these data are that there were no data to distinguish if any offenders in the sample actually participated in role playing activities, so the measures were more based on the exposure to modeling and role playing than actual involvement in various group activities, such as walking through the steps of a role play and the precise number of roles plays the offenders were exposed to in each group session that an offender attended.

Dosage data were also not as refined as they ideally could have been. In particular, all offenders, regardless of risk level, were given the same dosage of program length and group hours, but the start and end dates of programming were unknown so these data were based on what the average program length was. Group hours were based on each group the program ran and the total number of hours for each group. A more refined measure of dosage would capture these specific data for offenders. As a result, several assumptions were made for the sample

examined in the current study. These assumptions were defined within the third chapter of this dissertation.

The group hours dosage measure has other limitations that should be noted. Other dosage research, such as Bourgon and Armstrong (2005), Sperber et al., (2013b), and Sperber and Lowenkamp (2016), measured dosage for groups that focused on providing evidence-based practices, such as cognitive behavioral therapy, to offenders. For the current study, it is uncertain if these groups were consistently providing groups that targeted risk and needs or if the groups were evidence-based and delivered with fidelity.

Sample Limitations

The sample examined in the current study also had several limitations associated with it. First, as reported earlier, the sample was a part of an earlier investigation into the effectiveness of Pennsylvania's halfway houses. The sample in the current study was identified as the treatment sample in the prior research. The findings from the original evaluation/prior research clearly distinguished that offenders in the treatment sample had worse outcomes than those who were in the comparison group and did not participate in halfway house programming. As such, these offenders, who comprise the sample in the current study, were already known to have higher recidivism rates than those who did not participate in Pennsylvania halfway house programs. Further, the offenders in this sample primarily were directed to programming that was found to be ineffective based on the CPC ratings. Second, the majority of this sample was comprised of males. Third, when examining the use of core correctional practices, a subset of the study's current sample was evaluated. All of these limitations have an impact on the overall generalizability of the findings. Given that the offenders in this sample were participants in programming that was primarily poor in terms of overall quality and adherence to the principles

of effective intervention, it is important to note that sample may not be indicative of offenders who participate in similar programming. Taking into account the multiple limitations of this study, the next section offers practical implications from the current research.

Implications for Policy and Practice

There are several potential opportunities to be considered for policy and practice as a result of this study's findings. Without question, many of the study's findings may be more attributed to what could be labeled as lessons learned or what to avoid doing in terms of practice and perhaps much of this is due to examining the sample that had higher rates of recidivism to begin with. Certainly, the goal is not to increase recidivism rates for offenders or waste human and financial resources on efforts that possibly elevate harm for individuals. Yet, studies that provide information about lessons learned can be just as influential as those on what effective practices should be implemented to improve offender outcomes. This section offers a brief discussion on three lessons learned and how this relates to existing practice and what changes in practice should be considered.

Past research has shown that mixing risk produces harmful outcomes for low risk offenders. This study aligns with past research and the negative results that follow when low risk offenders are mixed with higher risk. Low risk offenders assigned to Pennsylvania halfway houses actually had higher recidivism rates than low risk offenders directly paroled to the streets. Even when trying to identify any possible influences on this related to dosage or targeting criminogenic needs, the overwhelming result was that low risk did not perform well and had high recidivism rates. So the first lesson is one that has been repeated multiple times and in multiple

studies, but policy and practice needs to limit or perhaps prohibit low risk offenders being directed to programming and interventions that are intended for higher risk populations.

The second lesson learned is associated with the risk principle and the importance of administering a validated risk and needs assessment. Throughout the analyses for the current study, risk continued to be a statistically significant predictor for recidivism. This finding held up across all four outcome measures and in both bivariate and multivariate analyses. In terms of practical implications, risk and needs assessment instruments should be validated on the target population and information obtained from these tools should be used to direct offenders to appropriate programming and interventions that match their risk and needs, while being deliberate in the decision-making to avoid mixing risk levels.

A third lesson that can be taken from the current study and even prior research that is related to how primary and secondary criminogenic needs are applied within corrections. The application of the needs principle is often just as challenging as the application of the risk principle. What is interesting about the final research question in this dissertation is that there are many aspects of the secondary criminogenic need targets that this sample of offenders was primarily in programming to address that closely model what offenders on supervision have listed out as their conditions. Specifically, parolees and probationers are often directed to find employment, complete their education, and to avoid drug and alcohol use. These secondary criminogenic needs are also considered stabilizing factors. In particular, getting a job or earning a diploma are both dynamic risk factors that are frequently expected to be a remedy for recidivism. These secondary criminogenic needs that are nearly synonymous with supervision conditions are also verifiable, which makes them ideal in terms of confirming progress during supervision. For example, supervision officers can contact an employer, ask for a paycheck stub

or even visit a client's workplace. The same type of verification process is available to check up on progress related to an offender's educational achievements. Related to substance abuse, supervision officers have the ability to conduct drug and alcohol testing of offenders both in the office and while the client is in the community. The challenge remains about how to target primary criminogenic needs that aren't as objectively verifiable, but certainly play a primary role in an offender's likelihood to recidivate. Simply put, the lesson learned is that more time has to be spent on targeting primary criminogenic needs, and if offenders are directed to programming, it is important to take advantage of this opportunity and ensure that the primary risk factors, or the Big Four, take priority over the secondary criminogenic needs in terms of group targets. This last section describes next steps for future research.

Recommendations for Future Research

There are several recommendations for future research related to dosage and criminogenic needs that should be considered. As it relates to measuring dosage, the empirical evidence and understanding of how dosage influences offender outcomes remains preliminary. However, Sperber et al., (2013a) have already offered a concise agenda for expanding the research on dosage and risk. Suggestions for future research on dosage aligns with their recommendations which can be briefly summarized as (1) clarifying the definition and measurement of dosage, (2) identifying what interventions, activities, and services should be counted in the measurement of dosage, (3) establishing if dosage varies based on risk and offender groups (e.g., gender, domestic violence, sex offenders, (4) distinguishing if program effectiveness is impacted when intensity is provided in weeks or months of programming, (5) determining if responsivity factors moderate the relationship between risk-based dosage and

recidivism, and (6) identifying if there is a maximum amount of dosage to produce successful outcomes for offenders. Clearly, there are many aspects regarding the impact of dosage that remain unresolved and will require both reliable data and a commitment by both practitioners and researchers alike to collaboratively address these gaps.

A second recommendation for future research centers upon the influence of programming and interventions on primary and secondary criminogenic needs. In particular, future research should seek to identify which interventions and specific program efforts (e.g., role playing, modeling, use of core correctional practices) mitigate these primary and secondary criminogenic needs. One issue that may have to be resolved before this research can fully commence is related to data collection. Specifically, programs should be given clear guidance on the application of reassessments and programmatic tools. Reassessments are often used to measure change with criminogenic needs or to determine changes in risk, but the practice varies in terms of when reassessments are conducted and for what purpose. Programmatic tools may be administered to identify if offenders have extinguished antisocial behaviors and attitudes and replaced these with prosocial alternatives, but the practice in using these tools is limited and may be more common in programs that are diligent in their efforts to adhere to the principles of effective intervention. By addressing the data collection needs and then pursuing the examination of the influence of programmatic efforts and interventions on primary and secondary criminogenic needs, practitioners and policy makers may be more intentional in terms of their selection of program targets, group interventions and curricula, and assessments.

Overall, the current research offers some practical implications for the field and should be given serious consideration as several findings were found to have replicated what prior research

has demonstrated related to the detrimental impact on offenders when the principles of effective intervention are not consistently adhered to.

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APPENDIX

Table A1. Average Number of Program Months and Recidivism Rates – Low Risk (N=864)

Average Months	Technical Violation (N=313)		Arrest (N=179)		Incarceration (N=316)		Any Recidivism (N=362)	
	N	%	N	%	N	%	N	%
1.5	53	43.4	35	28.7	54	44.3	62	50.8
2	6	66.7	4	44.4	6	66.7	8	88.9
2.5	19	35.8	11	20.8	19	35.8	25	47.2
3	139	42.6	74	22.7	141	43.3	156	47.9
4	10	28.6	3	8.6	10	28.6	12	34.3
4.5	17	30.4	11	19.6	17	30.4	19	33.9
5	22	28.2	16	20.5	22	28.2	27	34.6
6	29	29.3	16	16.2	29	29.3	34	34.3
7	0	0	0	0	0	0	0	0
8	11	26.2	7	16.7	11	26.2	12	28.6
9	1	11.1	1	11.1	1	11.1	1	11.1
12	6	24.0	1	4.0	6	24.0	6	24.0

Table A2. Average Number of Program Months and Recidivism Rates – Moderate Risk (N=1409)

Average Months	Technical Violation (N=703)		Arrest (N=428)		Incarceration (N=717)		Any Recidivism (N=814)	
	N	%	N	%	N	%	N	%
1	6	75.0	3	37.5	6	75.0	6	75.0
1.5	86	50.9	56	33.1	92	54.4	101	59.8
2	14	66.7	7	33.3	16	76.2	16	76.2
2.5	33	36.7	16	17.8	34	37.8	41	45.6
3	289	55.8	167	32.2	294	56.8	334	64.5
4	48	63.2	18	23.7	48	63.2	51	67.1
4.5	55	42.0	46	35.1	55	42.0	67	51.1
5	46	42.6	28	25.9	46	42.6	50	46.3
6	68	41.0	45	27.1	68	41.0	80	48.2
7	1	33.3	0	0	1	33.3	1	33.3
8	28	44.4	24	38.1	28	44.4	34	54.0
9	6	28.6	4	19.0	6	28.6	8	38.1
12	23	65.7	14	40.0	23	65.7	25	71.4

Table A3. Average Number of Program Months and Recidivism Rates – High Risk (N=1008)

Average Months	Technical Violation (N=568)		Arrest (N=364)		Incarceration (N=576)		Any Recidivism (N=639)	
	N	%	N	%	N	%	N	%
1	7	87.5	3	37.5	7	87.5	7	87.5
1.5	76	53.5	49	34.5	77	54.2	88	62.0
2	6	66.7	2	22.2	7	77.8	7	77.8
2.5	35	57.4	24	39.3	36	59.0	39	63.9
3	219	62.0	140	39.7	223	63.2	251	71.1
4	41	63.1	17	26.2	42	64.6	43	66.2
4.5	54	50.9	30	28.3	54	50.9	58	54.7
5	32	47.1	24	35.3	32	47.1	35	51.5
6	60	53.1	34	30.1	60	53.1	71	62.8
7	0	0	0	0	0	0	0	0
8	19	43.2	14	31.8	19	43.2	20	45.5
9	6	66.7	4	44.4	6	66.7	7	77.8
12	13	46.4	5	17.9	13	46.4	13	46.4

Table A4. Technical Violation Predicted by Control Variables

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.656	.154	18.121	1	.000	.519
Race	.061	.073	.682	1	.409	1.063
Age	-.008	.004	4.788	1	.029	.992
Sex Offender	.307	.365	.704	1	.401	1.359
Drug*	.514	.093	30.436	1	.000	1.673
Assault	.231	.081	8.249	1	.004	1.260
Low Risk (referent)			58.845	2	.000	
Moderate Risk*	.483	.090	28.502	1	.000	1.620
High Risk*	.742	.098	57.870	1	.000	2.101
Constant	-.744	.184	16.384	1	.000	.475

Model x^2=167.344, -2 Log Likelihood=4377.196, Pseudo R^2= .050 to .066, *p≤.001

Table A5. Technical Violation Predicted by Program Length

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.625	.155	16.224	1	.000	.535
Race	-.003	.075	.002	1	.965	.997
Age	-.009	.004	5.470	1	.019	.991
Sex Offender	.463	.365	1.610	1	.205	1.589
Drug*	.532	.094	32.031	1	.000	1.702
Assault*	.275	.081	11.426	1	.001	1.317
Low Risk (referent)			59.455	2	.000	
Moderate Risk*	.490	.091	28.961	1	.000	1.632
High Risk*	.752	.098	58.441	1	.000	2.120
1-3 Mos. (referent)			41.452	2	.000	
4-6 Months*	-.436	.079	30.300	1	.000	.646
7+ Months*	-.609	.134	20.587	1	.000	.544
Constant	-.544	.187	8.427	1	.004	.580

Model x^2=209.324, -2 Log Likelihood=4335.215, Pseudo R^2= .062 to .082, *p≤.001

Table A6. Technical Violation Predicted by Interaction of Program Length*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.625	.155	16.142	1	.000	.536
Race	.010	.075	.018	1	.895	1.010
Age	-.009	.004	5.843	1	.016	.991
Sex Offender	.457	.366	1.557	1	.212	1.580
Drug**	.528	.094	31.463	1	.000	1.695
Assault**	.276	.082	11.428	1	.001	1.317
Low Risk (referent)			19.062	2	.000	
Moderate Risk**	.381	.100	14.400	1	.000	1.464
High Risk**	.537	.129	17.422	1	.000	1.710
1-3 Months (referent)			33.935	2	.000	
4-6 Months**	-.632	.110	32.957	1	.000	.531
7+ Months**	-1.141	.249	21.078	1	.000	.319
Dosage*Risk*	.003	.001	6.625	1	.010	1.003
Constant	-.626	.190	10.794	1	.001	.535

Model x^2=216.018, -2 Log Likelihood=4328.521, Pseudo R^2= .064 to .085, **p≤.001,*p≤.01

Table A7. Technical Violation Predicted by Group Hours

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.580	.155	13.922	1	.000	.560
Race	.007	.075	.008	1	.927	1.007
Age	-.008	.004	4.730	1	.030	.992
Sex Offender	.285	.364	.613	1	.434	1.330
Drug*	.539	.094	32.971	1	.000	1.714
Assault	.238	.081	8.668	1	.003	1.269
Low Risk (referent)			56.612	2	.000	
Moderate Risk*	.481	.091	28.109	1	.000	1.617
High Risk*	.729	.098	55.487	1	.000	2.073
0-99 (referent)			19.693	2	.000	
100-199	-.075	.133	.323	1	.570	.927
200+*	.383	.090	18.267	1	.000	1.467
Constant	-.823	.186	19.499	1	.000	.439

Model x^2=187.196, -2 Log Likelihood=4347.353, Pseudo R^2= .055 to .074, *p≤.001

Table A8. Technical Violation Predicted by Interaction of Group Hours*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.582	.155	14.068	1	.000	.559
Race	-.005	.075	.005	1	.942	.995
Age	-.009	.004	4.908	1	.027	.991
Sex Offender	.322	.365	.778	1	.378	1.380
Drug*	.535	.094	32.421	1	.000	1.708
Assault	.239	.081	8.673	1	.003	1.269
Low Risk (referent)			36.899	2	.000	
Moderate Risk*	.425	.092	21.199	1	.000	1.529
High Risk*	.617	.104	35.448	1	.000	1.853
0- (referent)			3.962	2	.138	
100-199	-.299	.150	3.959	1	.047	.742
200+	-.174	.196	.795	1	.373	.840
Dosage*Risk	.000	.000	10.099	1	.001	1.000
Constant	-.770	.187	16.901	1	.000	.463

Model x^2=197.866, -2 Log Likelihood=4346.673, Pseudo R^2= .059 to .078, *p≤.001

Table A9. Arrest Predicted by Control Variables

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.512	.180	8.086	1	.004	.599
Race	-.157	.080	3.810	1	.051	.855
Age*	-.024	.004	31.957	1	.000	.976
Sex Offender	-.415	.496	.701	1	.402	.660
Drug	.237	.105	5.080	1	.024	1.268
Assault	.050	.089	.315	1	.574	1.051
Low Risk (referent)			37.818	2	.000	
Moderate Risk*	.448	.104	18.698	1	.000	1.564
High Risk*	.671	.109	37.602	1	.000	1.957
Constant	-.558	.204	7.476	1	.006	.573

Model x^2=107.793, -2 Log Likelihood=3846.227, Pseudo R^2= .032 to .046, *p≤.001

Table A10. Arrest Predicted by Program Length

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.489	.180	7.330	1	.007	.613
Race	-.199	.082	5.945	1	.015	.820
Age*	-.025	.004	33.599	1	.000	.975
Sex Offender	-.297	.497	.357	1	.550	.743
Drug	.248	.106	5.490	1	.019	1.281
Assault	.076	.090	.707	1	.400	1.079
Low Risk (referent)			38.413	2	.000	
Moderate Risk*	.452	.104	18.928	1	.000	1.571
High Risk*	.679	.110	38.203	1	.000	1.971
1-3 Mos. (referent)			16.415	2	.000	
4-6 Months*	-.327	.087	14.132	1	.000	.721
7+ Months	-.340	.148	5.267	1	.022	.712
Constant	-.407	.208	3.835	1	.050	.666

Model x^2=124.407, -2 Log Likelihood=3829.613, Pseudo R^2= .037 to .053, *p≤.001

Table A11. Arrest Predicted by Interaction of Program Length*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.488	.181	7.311	1	.007	.614
Race	-.194	.082	5.615	1	.018	.824
Age*	-.025	.004	33.861	1	.000	.975
Sex Offender	-.301	.497	.366	1	.545	.740
Drug	.246	.106	5.415	1	.020	1.280
Assault	.076	.090	.711	1	.399	1.079
Low Risk (referent)			18.901	2	.000	
Moderate Risk*	.413	.113	13.262	1	.000	1.512
High Risk*	.604	.142	18.172	1	.000	1.829
1-3 Mos. (referent)			10.939	2	.004	
4-6 Months*	-.397	.121	10.828	1	.001	.672
7+ Months	-.529	.272	3.776	1	.052	.589
Dosage*Risk	.001	.001	.698	1	.403	1.001
Constant	-.435	.210	4.275	1	.039	.647

Model x^2=125.104, -2 Log Likelihood=3828.916, Pseudo R^2= .037 to .053, *p≤.001

Table A12. Arrest Predicted by Group Hours

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.475	.181	6.865	1	.009	.622
Race	-.172	.082	4.404	1	.036	.842
Age*	-.024	.004	31.782	1	.000	.976
Sex Offender	-.408	.496	.679	1	.410	.665
Drug	.244	.106	5.330	1	.021	1.276
Assault	.050	.089	.311	1	.577	1.051
Low Risk (referent)			37.133	2	.000	
Moderate Risk*	.444	.104	18.408	1	.000	1.559
High Risk*	.666	.110	36.911	1	.000	1.946
0-99 (referent)			3.177	2	.204	
100-199	.104	.142	.543	1	.461	1.110
200+	.164	.096	2.947	1	.086	1.179
Constant	-.602	.206	8.563	1	.003	.548

Model x^2=110.949, -2 Log Likelihood=3843.071, Pseudo R^2= .033 to .047, *p≤.001

Table A13. Arrest Predicted by Interaction of Group Hours*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.474	.181	6.849	1	.009	.622
Race	-.170	.082	4.288	1	.038	.844
Age*	-.024	.004	31.735	1	.000	.976
Sex Offender	-.413	.496	.695	1	.405	.662
Drug	.245	.106	5.368	1	.021	1.277
Assault	.050	.089	.311	1	.577	1.051
Low Risk (referent)			35.271	2	.000	
Moderate Risk*	.453	.105	18.580	1	.000	1.573
High Risk*	.684	.116	34.964	1	.000	1.981
0-99 (referent)			1.674	2	.433	
100-199	.139	.158	.770	1	.380	1.149
200+	.252	.202	1.554	1	.213	1.286
Dosage*Risk	.000	.000	.240	1	.624	1.000
Constant	-.612	.207	8.748	1	.003	.543

Model x^2=111.899, -2 Log Likelihood=3842.831, Pseudo R^2= .033 to .048, *p≤.001

Table A14. Incarceration Predicted by Control Variables

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.654	.153	18.181	1	.000	.520
Race	.091	.073	1.540	1	.215	1.095
Age	-.009	.004	5.000	1	.025	.991
Sex Offender	.283	.365	.599	1	.439	1.327
Drug*	.516	.093	30.841	1	.000	1.676
Assault	.214	.081	7.088	1	.008	1.239
Low Risk (referent)			62.745	2	.000	
Moderate Risk*	.510	.090	31.957	1	.000	1.666
High Risk*	.763	.098	61.231	1	.000	2.145
Constant	-.728	.184	15.713	1	.000	.483

Model x^2=169.596, -2 Log Likelihood=4377.626, Pseudo R^2= .050 to .067, *p≤.001

Table A15. Incarceration Predicted by Program Length

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.621	.155	16.111	1	.000	.538
Race	.022	.075	.090	1	.765	1.023
Age	-.009	.004	5.797	1	.016	.991
Sex Offender	.454	.365	1.548	1	.213	1.575
Drug*	.536	.094	32.669	1	.000	1.710
Assault*	.263	.082	10.398	1	.001	1.301
Low Risk (referent)			63.634	2	.000	
Moderate Risk*	.520	.091	32.605	1	.000	1.682
High Risk*	.775	.098	62.058	1	.000	2.171
1-3 Mos. (referent)			49.761	2	.000	
4-6 Months*	-.485	.079	37.277	1	.000	.616
7+ Months*	-.654	.134	23.725	1	.000	.520
Constant	-.509	.187	7.374	1	.007	.601

Model x^2=220.059, -2 Log Likelihood=4327.163, Pseudo R^2= .065 to .087, *p≤.001

Table A16. Incarceration Predicted by Interaction of Program Length*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.619	.155	16.029	1	.000	.538
Race	.034	.075	.209	1	.647	1.035
Age	-.010	.004	6.143	1	.013	.990
Sex Offender	.449	.367	1.501	1	.220	1.567
Drug*	.533	.094	32.143	1	.000	1.704
Assault*	.263	.082	10.397	1	.001	1.301
Low Risk (referent)			22.610	2	.000	
Moderate Risk*	.421	.100	17.591	1	.000	1.523
High Risk*	.580	.129	20.289	1	.000	1.785
1-3 Mos. (referent)			36.739	2	.000	
4-6 Months*	-.663	.110	36.209	1	.000	.515
7+ Months*	-1.138	.248	21.006	1	.000	.320
Dosage*Risk	.003	.001	5.488	1	.019	1.003
Constant	-.583	.190	9.385	1	.002	.558

Model x^2=225.596, -2 Log Likelihood=4321.626, Pseudo R^2= .066 to .089, *p≤.001

Table A17. Incarceration Predicted by Group Hours

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.574	.155	13.807	1	.000	.563
Race	.036	.075	.236	1	.627	1.037
Age	-.009	.004	4.934	1	.026	.991
Sex Offender	.261	.365	.514	1	.474	1.299
Drug*	.542	.094	33.483	1	.000	1.719
Assault	.221	.081	7.486	1	.006	1.248
Low Risk (referent)			60.428	2	.000	
Moderate Risk*	.508	.091	31.530	1	.000	1.663
High Risk*	.750	.098	58.725	1	.000	2.117
0-99 (referent)			20.936	2	.000	
100-199	-.067	.133	.255	1	.614	.935
200+*	.398	.090	19.612	1	.000	1.489
Constant	-.811	.186	18.973	1	.000	.444

Model x^2=190.733, -2 Log Likelihood=4356.489, Pseudo R^2= .056 to .075, *p≤.001

Table A18. Incarceration Predicted by Interaction of Group Hours*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.576	.154	13.965	1	.000	.562
Race	.024	.075	.101	1	.751	1.024
Age	-.009	.004	5.127	1	.024	.991
Sex Offender	.299	.365	.671	1	.413	1.349
Drug*	.538	.094	32.908	1	.000	1.712
Assault	.222	.081	7.486	1	.006	1.248
Low Risk (referent)			39.596	2	.000	
Moderate Risk*	.451	.092	23.929	1	.000	1.569
High Risk*	.635	.104	37.508	1	.000	1.886
0-99 (referent)			3.922	2	.141	
100-199	-.298	.151	3.920	1	.048	.742
200+	-.177	.197	.811	1	.368	.838
Dosage*Risk	.000	.000	10.584	1	.001	1.000
Constant	-.756	.187	16.339	1	.000	.469

Model x^2=201.967, -2 Log Likelihood=4345.255, Pseudo R^2= .060 to .080, *p≤.001

Table A19. Any Recidivism Predicted by Control Variables

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.621	.148	17.652	1	.000	.537
Race	.057	.074	.597	1	.440	1.059
Age	-.012	.004	9.646	1	.002	.988
Sex Offender	.070	.365	.037	1	.848	1.073
Drug*	.442	.091	23.411	1	.000	1.556
Assault	.146	.081	3.299	1	.069	1.157
Low Risk (referent)			74.191	2	.000	
Moderate Risk*	.570	.089	40.921	1	.000	1.768
High Risk*	.818	.097	70.529	1	.000	2.265
Constant	-.268	.182	2.170	1	.141	.765

Model x^2=165.616, -2 Log Likelihood=4345.622, Pseudo R^2= .049 to .066, *p≤.001

Table A20. Any Recidivism Predicted by Program Length

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.584	.149	15.243	1	.000	.558
Race	-.021	.075	.075	1	.784	.980
Age*	-.013	.004	10.739	1	.001	.987
Sex Offender	.256	.365	.492	1	.483	1.292
Drug*	.464	.092	25.257	1	.000	1.591
Assault	.202	.082	6.127	1	.013	1.224
Low Risk (referent)			75.239	2	.000	
Moderate Risk*	.582	.090	41.790	1	.000	1.790
High Risk*	.832	.098	71.458	1	.000	2.298
1-3 Mos. (referent)			61.196	2	.000	
4-6 Months*	-.530	.080	44.322	1	.000	.588
7+ Months*	-.748	.133	31.573	1	.000	.474
Constant	-.024	.187	.016	1	.898	.976

Model x^2=227.651, -2 Log Likelihood=4283.587, Pseudo R^2= .067 to .090, *p≤.001

Table A21. Any Recidivism Predicted by Interaction of Program Length*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.583	.150	15.152	1	.000	.558
Race	-.008	.076	.012	1	.913	.992
Age*	-.013	.004	11.261	1	.001	.987
Sex Offender	.249	.367	.460	1	.498	1.282
Drug*	.460	.093	24.744	1	.000	1.584
Assault	.202	.082	6.141	1	.013	1.224
Low Risk (referent)			27.075	2	.000	
Moderate Risk*	.474	.100	22.577	1	.000	1.606
High Risk*	.617	.129	22.741	1	.000	1.852
1-3 Mos. (referent)			44.106	2	.000	
4-6 Months*	-.723	.110	43.116	1	.000	.485
7+ Months*	-1.270	.246	26.608	1	.000	.281
Dosage*Risk	.003	.001	6.470	1	.011	1.003
Constant	-.104	.189	.299	1	.585	.902

Model x^2=234.209, -2 Log Likelihood=4277.029, Pseudo R^2= .069 to .092, *p≤.001

Table A22. Any Recidivism Predicted by Group Hours

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.537	.149	12.957	1	.000	.585
Race	-.004	.075	.002	1	.962	.996
Age	-.012	.004	9.568	1	.002	.988
Sex Offender	.042	.365	.013	1	.908	1.043
Drug*	.470	.092	26.037	1	.000	1.599
Assault	.154	.081	3.641	1	.056	1.167
Low Risk (referent)			71.627	2	.000	
Moderate Risk*	.569	.089	40.499	1	.000	1.767
High Risk*	.804	.098	67.647	1	.000	2.234
0-99 (referent)			24.427	2	.000	
100-199	-.100	.133	.565	1	.452	.905
200+*	.434	.092	22.389	1	.000	1.544
Constant	-.354	.185	3.675	1	.055	.702

Model x^2=190.533, -2 Log Likelihood=4320.705, Pseudo R^2= .056 to .076, *p≤.001

Table A23. Any Recidivism Predicted by Interaction of Group Hours*Risk

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.538	.149	13.058	1	.000	.584
Race	-.010	.075	.019	1	.889	.990
Age	-.012	.004	9.692	1	.002	.988
Sex Offender	.064	.365	.030	1	.861	1.066
Drug*	.467	.092	25.724	1	.000	1.595
Assault	.154	.081	3.623	1	.057	1.166
Low Risk (referent)			55.312	2	.000	
Moderate Risk*	.537	.091	34.817	1	.000	1.712
High Risk*	.740	.104	51.103	1	.000	2.096
0-99 (referent)			4.487	2	.106	
100-199	-.228	.150	2.302	1	.129	.796
200+	.115	.196	.344	1	.557	1.122
Dosage*Risk	.000	.000	3.314	1	.069	1.000
Constant	-.324	.185	3.059	1	.080	.723

Model x^2=193.963, -2 Log Likelihood=4317.275, Pseudo R^2= .057 to .077, *p≤.001

Table A24. Technical Violation, Program Length, and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.680	.156	19.022	1	.000	.507
Race	-.015	.075	.040	1	.842	.985
Age	-.008	.004	4.691	1	.030	.992
Sex Offender	.477	.367	1.689	1	.194	1.610
Drug*	.507	.094	28.997	1	.000	1.660
Assault	.256	.081	9.913	1	.002	1.292
LSI-R*	.042	.005	70.963	1	.000	1.043
Program Length*	-.096	.018	29.917	1	.000	.908
CPC Total	-.010	.005	5.085	1	.024	.990
Constant	-.568	.276	4.242	1	.039	.567

-2 Log Likelihood=4331.650, Pseudo R^2= .063 to .084, *p≤.001

Table A25. Technical Violation, Group Hours and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.610	.156	15.266	1	.000	.543
Race	.004	.075	.003	1	.959	1.004
Age	-.009	.004	4.865	1	.027	.992
Sex Offender	.327	.365	.800	1	.371	1.386
Drug*	.515	.094	29.882	1	.000	1.674
Assault	.229	.081	7.951	1	.005	1.257
LSI-R*	.041	.005	68.459	1	.000	1.042
CPC Total	-.009	.005	3.451	1	.063	.992
Group Hours*	.001	.000	23.930	1	.000	1.001
Constant	-1.116	.259	18.570	1	.000	.328

-2 Log Likelihood=4338.081, Pseudo R2= .061 to .081, *p≤.001

Table A26. Arrest, Program Length and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.535	.181	8.767	1	.003	.586
Race	-.216	.082	6.969	1	.008	.805
Age*	-.025	.004	33.207	1	.000	.975
Sex Offender	-.299	.497	.361	1	.548	.742
Drug	.242	.106	5.220	1	.022	1.274
Assault	.063	.090	.487	1	.485	1.065
LSI-R*	.035	.005	41.557	1	.000	1.036
Program Length*	-.063	.020	10.366	1	.001	.939
CPC Total	.000	.005	.001	1	.972	1.000
Constant	-.754	.302	6.247	1	.012	.470

-2 Log Likelihood=3831.174, Pseudo R^2= .037 to .052, *p≤.001

Table A27. Arrest, Group Hours and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.536	.181	8.735	1	.003	.585
Race	-.175	.081	4.653	1	.031	.839
Age*	-.025	.004	33.545	1	.000	.975
Sex Offender	-.406	.495	.672	1	.412	.666
Drug	.240	.106	5.162	1	.023	1.271
Assault	.044	.089	.239	1	.625	1.045
LSI-R*	.035	.005	41.563	1	.000	1.036
CPC Total	.003	.005	.266	1	.606	1.003
Group Hours	.000	.000	.382	1	.537	1.000
Constant	-1.108	.282	15.428	1	.000	.330

-2 Log Likelihood=3841.558, Pseudo R^2= .034 to .048, *p≤.001

Table A28. Incarceration, Program Length and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.677	.155	19.053	1	.000	.508
Race	.008	.075	.012	1	.913	1.008
Age	-.009	.004	4.869	1	.027	.992
Sex Offender	.466	.367	1.613	1	.204	1.593
Drug*	.510	.094	29.516	1	.000	1.666
Assault	.244	.081	8.948	1	.003	1.276
LSI-R*	.043	.005	73.472	1	.000	1.044
Program Length*	-.107	.018	36.549	1	.000	.898
CPC Total	-.011	.005	6.054	1	.014	.989
Constant	-.477	.276	2.990	1	.084	.621

-2 Log Likelihood=4326.248, Pseudo R^2= .065 to .087, *p≤.001

Table A29. Incarceration, Group Hours and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.605	.155	15.216	1	.000	.546
Race	.033	.075	.192	1	.661	1.033
Age	-.009	.004	5.089	1	.024	.991
Sex Offender	.299	.365	.669	1	.413	1.348
Drug*	.518	.094	30.390	1	.000	1.679
Assault	.212	.081	6.854	1	.009	1.237
LSI-R*	.042	.005	70.802	1	.000	1.043
CPC Total	-.009	.005	3.912	1	.048	.991
Group Hours*	.001	.000	25.559	1	.000	1.001
Constant	-1.083	.259	17.499	1	.000	.339

-2 Log Likelihood=4337.963, Pseudo R^2= .062 to .082, *p≤.001

Table A30. Any Recidivism, Program Length and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.644	.150	18.507	1	.000	.525
Race	-.034	.075	.199	1	.656	.967
Age	-.012	.004	9.593	1	.002	.988
Sex Offender	.254	.366	.483	1	.487	1.290
Drug*	.441	.092	22.748	1	.000	1.554
Assault	.179	.081	4.830	1	.028	1.196
LSI-R*	.045	.005	80.554	1	.000	1.046
Program Length*	-.115	.018	42.787	1	.000	.892
CPC Total	-.009	.005	4.090	1	.043	.991
Constant	-.066	.276	.057	1	.811	.936

-2 Log Likelihood=4292.817, Pseudo R^2= .064 to .086, *p≤.001

Table A31. Any Recidivism, Group Hours and Program Effectiveness

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.582	.150	15.116	1	.000	.559
Race	.001	.075	.000	1	.993	1.001
Age	-.012	.004	10.028	1	.002	.988
Sex Offender	.076	.364	.043	1	.836	1.079
Drug*	.446	.092	23.399	1	.000	1.562
Assault	.143	.081	3.135	1	.077	1.154
LSI-R*	.044	.005	77.750	1	.000	1.045
CPC Total	-.006	.005	1.944	1	.163	.994
Group Hours*	.001	.000	21.272	1	.000	1.001
Constant	-.714	.258	7.636	1	.006	.490

-2 Log Likelihood=4314.852, Pseudo R^2= .058 to .078, *p≤.001

Table A32. Modeling by Risk Level and Technical Violation Rates – Low (N=616)

Modeling Occurred	No – Technical Violation		Yes – Technical Violation	
	N	%	N	%
No	92	66.7	46	33.3
Yes	286	59.8	192	40.2

[a] Pearson $x^2 = 2.109$, p = .146

Table A33. Modeling by Risk Level and Technical Violation Rates – Moderate (N=994)

Modeling Occurred	No – Technical Violation		Yes – Technical Violation	
	N	%	N	%
No	122	49.8	123	50.2
Yes	352	47.0	397	53.0

[a] Pearson $x^2 = .580$, p = .446

Table A34. Modeling by Risk Level and Technical Violation Rates – High (N=761)

Modeling Occurred	No – Technical Violation		Yes – Technical Violation	
	N	%	N	%
No	82	41.8	114	58.2
Yes	240	42.5	325	57.5

[a] Pearson $x^2 = .001$, p = .975

Table A35. Modeling by Risk Level and Arrest Rates – Low (N=616)

Modeling Occurred	No – Arrest		Yes – Arrest	
	N	%	N	%
No	112	81.2	26	18.8
Yes	376	78.7	102	21.3

[a] Pearson $x^2 = .406$, p = .524

Table A36. Modeling by Risk Level and Arrest Rates – Moderate (N=994)

Modeling Occurred	No – Arrest		Yes – Arrest	
	N	%	N	%
No	183	74.7	62	25.3
Yes	503	67.2	246	32.8

[a] Pearson $x^2 = 4.905$, p = .027

Table A37. Modeling by Risk Level and Arrest Rates – High (N=761)

Modeling Occurred	No – Arrest		Yes – Arrest	
	N	%	N	%
No	133	67.9	63	32.1
Yes	366	64.8	199	35.2

[a] Pearson $x^2 = .611$, p = .434

Table A38. Modeling by Risk Level and Incarceration Rates – Low (N=616)

Modeling Occurred	No – Incarceration		Yes – Incarceration	
	N	%	N	%
No	91	65.9	47	34.1
Yes	284	59.4	194	40.6

[a] Pearson $x^2 = 1.916$, p = .166

Table A39. Modeling by Risk Level and Incarceration Rates – Moderate (N=994)

Modeling Occurred	No – Incarceration		Yes – Incarceration	
	N	%	N	%
No	121	49.4	124	50.6
Yes	339	45.3	410	54.7

[a] Pearson $x^2 = 1.265$, p = .261

Table A40. Modeling by Risk Level and Incarceration Rates – High (N=761)

Modeling Occurred	No – Incarceration		Yes – Incarceration	
	N	%	N	%
No	81	41.3	115	58.7
Yes	236	41.8	329	58.2

[a] Pearson $x^2 = .012$, p = .914

Table A41. Modeling by Risk Level and Any Recidivism Rates – Low (N=616)

Modeling Occurred	No – Any Recidivism		Yes – Any Recidivism	
	N	%	N	%
No	83	60.1	55	39.9
Yes	260	54.4	218	45.6

[a] Pearson $x^2 = 1.436$, p = .231

Table A42. Modeling by Risk Level and Any Recidivism Rates – Moderate (N=994)

Modeling Occurred	No – Any Recidivism		Yes – Any Recidivism	
	N	%	N	%
No	104	42.4	141	57.6
Yes	291	38.9	458	61.1

[a] Pearson x^2 = .998, p = .318

Table A43. Modeling by Risk Level and Any Recidivism Rates – High (N=761)

Modeling Occurred	No – Any Recidivism		Yes – Any Recidivism	
	N	%	N	%
No	69	35.2	127	64.8
Yes	202	35.8	363	64.2

[a] Pearson x^2 = .019, p = .890

Table A44. Technical Violation and CPAI 2000 Sections (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.632	.220	8.288	1	.004	.531
Race	-.030	.101	.089	1	.765	.970
Age	-.010	.005	3.589	1	.058	.990
Sex Offender	.498	.526	.896	1	.344	1.645
Drug**	.677	.123	30.397	1	.000	1.968
Assault*	.276	.108	6.567	1	.010	1.318
Low Risk (referent)			27.592	2	.000	
Moderate Risk**	.477	.120	15.854	1	.000	1.611
High Risk**	.663	.129	26.366	1	.000	1.941
Anti-criminal Modeling	.112	.054	4.335	1	.037	1.119
Effect. Reinforcement*	-.159	.062	6.671	1	.010	.853
Effective Disapproval	-.058	.052	1.258	1	.262	.943
Problem Solving	.032	.040	.640	1	.424	1.033
Skills Building**	.138	.041	11.257	1	.001	1.148
Effective Authority	-.043	.022	3.807	1	.051	.958
Cognitive Self Change	-.036	.043	.687	1	.407	.965
Relationship Practice	.055	.060	.830	1	.362	1.056
Structuring Skills	-.216	.182	1.414	1	.234	.806
Motivational Interview	.066	.084	.625	1	.429	1.069
Constant	-.531	.387	1.882	1	.170	.588

Model x^2=152.075, -2 Log Likelihood=2563.574, Pseudo R^2= .075 to .100, **p≤.001, *p≤.01

Table A45. Arrest and CPAI 2000 Sections (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.264	.241	1.200	1	.273	.768
Race	-.046	.107	.187	1	.666	.955
Age**	-.021	.006	14.091	1	.000	.979
Sex Offender	-1.532	1.044	2.153	1	.142	.216
Drug	.340	.136	6.236	1	.013	1.405
Assault	-.030	.117	.067	1	.796	.970
Low Risk (referent)			19.742	2	.000	
Moderate Risk**	.484	.134	13.132	1	.000	1.623
High Risk**	.612	.142	18.630	1	.000	1.844
Anti-criminal Modeling	-.004	.057	.005	1	.944	.996
Effective Reinforcement	.056	.066	.704	1	.401	1.057
Effective Disapproval	.078	.055	1.984	1	.159	1.081
Problem Solving	.100	.043	5.328	1	.021	1.106
Skills Building	.045	.044	1.075	1	.300	1.046
Effective Authority	-.034	.023	2.122	1	.145	.967
Cognitive Self Change	.018	.047	.153	1	.696	1.018
Relationship Practice	.123	.065	3.586	1	.058	1.131
Structuring Skills	-.261	.195	1.788	1	.181	.770
Motivational Interview	.117	.089	1.726	1	.189	1.124
Constant	-1.319	.415	10.078	1	.002	.267

Model x^2=64.495, -2 Log Likelihood=2346.796, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01

Table A46. Incarceration and CPAI 2000 Sections (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.625	.219	8.171	1	.004	.535
Race	.021	.101	.043	1	.836	1.021
Age	-.010	.005	4.123	1	.042	.990
Sex Offender	.456	.526	.752	1	.386	1.577
Drug**	.689	.123	31.510	1	.000	1.991
Assault	.256	.108	5.596	1	.018	1.291
Low Risk (referent)			29.413	2	.000	
Moderate Risk**	.522	.120	18.958	1	.000	1.685
High Risk**	.672	.129	27.053	1	.000	1.959
Anti-criminal Modeling	.111	.054	4.224	1	.040	1.118
Effective Reinforcement	-.156	.062	6.385	1	.012	.856
Effective Disapproval	-.067	.052	1.659	1	.198	.935
Problem Solving	.033	.040	.683	1	.409	1.034
Skills Building**	.148	.041	12.787	1	.000	1.159
Effective Authority	-.046	.022	4.336	1	.037	.955
Cognitive Self Change	-.028	.043	.418	1	.518	.972
Relationship Practice	.043	.060	.502	1	.479	1.043
Structuring Skills	-.182	.182	1.002	1	.317	.833
Motivational Interview	.048	.084	.322	1	.570	1.049
Constant	-.450	.388	1.345	1	.246	.638

Model x^2=156.788, -2 Log Likelihood=2555.839, Pseudo R^2= .077 to .103, **p≤.001, *p≤.01

Table A47. Any Recidivism and CPAI 2000 Sections (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.597	.216	7.631	1	.006	.551
Race	.058	.102	.325	1	.568	1.060
Age	-.012	.005	4.984	1	.026	.988
Sex Offender	.159	.525	.092	1	.762	1.173
Drug**	.641	.121	27.910	1	.000	1.899
Assault	.137	.109	1.588	1	.208	1.147
Low Risk (referent)			38.745	2	.000	
Moderate Risk**	.609	.119	26.056	1	.000	1.838
High Risk**	.760	.130	34.441	1	.000	2.139
Anti-criminal Modeling	.098	.055	3.220	1	.073	1.103
Effective Reinforcement	-.126	.062	4.210	1	.040	.881
Effective Disapproval	-.058	.052	1.213	1	.271	.944
Problem Solving	.052	.041	1.639	1	.200	1.054
Skills Building*	.128	.041	9.550	1	.002	1.136
Effective Authority	-.044	.022	3.919	1	.048	.957
Cognitive Self Change	-.032	.044	.544	1	.461	.968
Relationship Practice	.021	.061	.117	1	.732	1.021
Structuring Skills	-.230	.183	1.577	1	.209	.794
Motivational Interview	.115	.085	1.830	1	.176	1.122
Constant	-.141	.391	.129	1	.719	.869

Model x^2=143.707, -2 Log Likelihood=2516.922, Pseudo R^2= .071 to .095, **p≤.001, *p≤.01

Table A48. Technical Violations and CPAI 2000 Total Score (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.509	.213	5.728	1	.017	.601
Race	.067	.095	.502	1	.479	1.070
Age	-.008	.005	2.389	1	.122	.992
Sex Offender	.353	.514	.470	1	.493	1.423
Drug**	.659	.121	29.710	1	.000	1.932
Assault	.253	.106	5.703	1	.017	1.288
Low Risk (referent)			24.804	2	.000	
Moderate Risk**	.443	.118	14.166	1	.000	1.558
High Risk**	.615	.126	23.697	1	.000	1.851
Total CPAI-2000	-.002	.009	.082	1	.774	.998
Constant	-.672	.295	5.202	1	.023	.511

Model x^2=104.896, -2 Log Likelihood=2610.843, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01

Table A49. Arrest and CPAI 2000 Total Score (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.302	.235	1.648	1	.199	.740
Race	-.043	.102	.177	1	.674	.958
Age**	-.019	.006	12.302	1	.000	.981
Sex Offender	-1.394	1.042	1.791	1	.181	.248
Drug*	.353	.135	6.787	1	.009	1.423
Assault	-.008	.116	.004	1	.948	.992
Low Risk (referent)			18.445	2	.000	
Moderate Risk**	.466	.133	12.286	1	.000	1.593
High Risk**	.586	.140	17.391	1	.000	1.796
Total CPAI-2000	.009	.009	.901	1	.343	1.009
Constant	-.931	.321	8.418	1	.004	.394

Model x^2=55.690, -2 Log Likelihood=2355.602, Pseudo R^2= .028 to .040, **p≤.001, *p≤.01

Table A50. Incarceration and CPAI 2000 Total Score (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.491	.211	5.399	1	.020	.612
Race	.127	.095	1.777	1	.183	1.135
Age	-.008	.005	2.726	1	.099	.992
Sex Offender	.322	.514	.393	1	.531	1.380
Drug**	.666	.121	30.533	1	.000	1.946
Assault	.231	.106	4.753	1	.029	1.260
Low Risk (referent)			26.477	2	.000	
Moderate Risk**	.486	.118	17.058	1	.000	1.626
High Risk**	.623	.126	24.303	1	.000	1.865
Total CPAI-2000	-.001	.009	.011	1	.916	.999
Constant	-.681	.295	5.346	1	.021	.506

Model x^2=105.088, -2 Log Likelihood=2607.539, Pseudo R^2= .052 to .070, **p≤.001, *p≤.01

Table A51. Any Recidivism and CPAI 2000 Total Score (N=1960)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.466	.209	4.985	1	.026	.628
Race	.154	.096	2.533	1	.111	1.166
Age	-.009	.005	3.441	1	.064	.991
Sex Offender	.104	.514	.041	1	.840	1.109
Drug**	.620	.119	26.952	1	.000	1.859
Assault	.123	.107	1.319	1	.251	1.131
Low Risk (referent)			35.619	2	.000	
Moderate Risk**	.572	.117	23.821	1	.000	1.772
High Risk**	.714	.127	31.648	1	.000	2.042
Total CPAI-2000	-.001	.009	.012	1	.911	.999
Constant	-.354	.296	1.431	1	.232	.702

Model x^2=100.128, -2 Log Likelihood=2560.501, Pseudo R^2= .050 to .067, **p≤.001, *p≤.01

Table A52. Technical Violations and Non-Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.727	.156	21.588	1	.000	.483
Race	.068	.074	.857	1	.355	1.070
Age	-.009	.004	5.741	1	.017	.991
Sex Offender	.335	.366	.837	1	.360	1.398
Drug**	.520	.093	30.997	1	.000	1.682
Assault*	.223	.081	7.605	1	.006	1.249
Low Risk (referent)			60.221	2	.000	
Moderate Risk**	.490	.091	29.280	1	.000	1.632
High Risk**	.752	.098	59.206	1	.000	2.122
Non-crim*	.099	.035	8.160	1	.004	1.104
Constant	-.826	.186	19.623	1	.000	.438

Model x^2=175.520, -2 Log Likelihood=4369.019, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01

Table A53. Arrest and Non-Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.531	.182	8.519	1	.004	.588
Race	-.155	.080	3.714	1	.054	.856
Age*	-.025	.004	32.385	1	.000	.976
Sex Offender	-.408	.496	.676	1	.411	.665
Drug	.239	.105	5.151	1	.023	1.270
Assault	.047	.089	.280	1	.597	1.048
Low (referent)			38.061	2	.000	
Moderate Risk**	.449	.104	18.829	1	.000	1.567
High Risk**	.674	.110	37.844	1	.000	1.962
Non-crim	.028	.038	.536	1	.464	1.028
Constant	-.579	.206	7.899	1	.005	.560

Model x^2=108.328, -2 Log Likelihood=3845.692, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01

Table A54. Incarceration and Non-Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.729	.156	21.948	1	.000	.482
Race	.099	.074	1.818	1	.178	1.104
Age	-.009	.004	6.039	1	.014	.991
Sex Offender	.313	.366	.731	1	.393	1.368
Drug**	.522	.093	31.445	1	.000	1.686
Assault	.205	.081	6.456	1	.011	1.228
Low Risk (referent)			64.277	2	.000	
Moderate Risk**	.518	.090	32.845	1	.000	1.679
High Risk**	.774	.098	62.709	1	.000	2.169
Non-crim*	.106	.035	9.278	1	.002	1.111
Constant	-.815	.186	19.156	1	.000	.442

Model x^2=178.899, -2 Log Likelihood=4368.323, Pseudo R^2= .053 to .071, **p≤.001, *p≤.01

Table A55. Any Recidivism and Non-Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.682	.150	20.619	1	.000	.506
Race	.064	.074	.744	1	.388	1.066
Age**	-.013	.004	10.730	1	.001	.987
Sex Offender	.094	.366	.065	1	.798	1.098
Drug**	.447	.092	23.826	1	.000	1.563
Assault	.139	.081	2.949	1	.086	1.149
Low Risk (referent)			75.506	2	.000	
Moderate Risk**	.577	.089	41.739	1	.000	1.780
High Risk**	.826	.098	71.766	1	.000	2.285
Non-crim	.085	.035	5.991	1	.014	1.089
Constant	-.338	.185	3.361	1	.067	.713

Model x^2=171.628, -2 Log Likelihood=4339.611, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01

Table A56. Technical Violations and Percentage Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.712	.158	20.395	1	.000	.491
Race	.055	.074	.554	1	.457	1.056
Age	-.009	.004	4.998	1	.025	.991
Sex Offender	.331	.366	.820	1	.365	1.393
Drug**	.512	.093	30.146	1	.000	1.669
Assault*	.232	.081	8.298	1	.004	1.261
Low Risk (referent)			59.269	2	.000	
Moderate Risk**	.484	.090	28.583	1	.000	1.622
High Risk**	.746	.098	58.320	1	.000	2.108
% Crim	-.004	.002	3.145	1	.076	.996
Constant	-.346	.290	1.426	1	.232	.707

Model x^2=170.510, -2 Log Likelihood=4374.030, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01

Table A57. Arrest and Percentage Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex*	-.522	.183	8.126	1	.004	.593
Race	-.158	.080	3.853	1	.050	.854
Age**	-.025	.004	32.028	1	.000	.976
Sex Offender	-.411	.496	.687	1	.407	.663
Drug	.237	.105	5.061	1	.024	1.267
Assault	.050	.089	.318	1	.573	1.052
Low Risk (referent)			37.871	2	.000	
Moderate Risk**	.448	.104	18.711	1	.000	1.565
High Risk**	.672	.109	37.656	1	.000	1.958
% Crim	-.001	.003	.090	1	.764	.999
Constant	-.484	.318	2.316	1	.128	.616

Model x^2=107.833, -2 Log Likelihood=3846.137, Pseudo R^2= .032 to .046, **p≤.001, *p≤.01

Table A58. Incarceration and Percentage Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.709	.157	20.478	1	.000	.492
Race	.085	.074	1.344	1	.246	1.089
Age	-.009	.004	5.213	1	.022	.991
Sex Offender	.308	.366	.707	1	.400	1.360
Drug**	.514	.093	30.546	1	.000	1.672
Assault*	.215	.081	7.129	1	.008	1.240
Low Risk (referent)			63.176	2	.000	
Moderate Risk**	.511	.090	32.044	1	.000	1.667
High Risk**	.767	.098	61.695	1	.000	2.153
% Crim	-.004	.002	3.165	1	.075	.996
Constant	-.328	.290	1.282	1	.257	.720

Model x^2=104.896, -2 Log Likelihood=2610.843, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01

Table A59. Any Recidivism and Percentage Criminogenic Needs (N=3281)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.669	.151	19.548	1	.000	.512
Race	.052	.074	.493	1	.482	1.053
Age*	-.012	.004	9.884	1	.002	.988
Sex Offender	.091	.366	.063	1	.803	1.096
Drug**	.440	.091	23.195	1	.000	1.553
Assault	.147	.081	3.306	1	.069	1.158
Low Risk (referent)			74.573	2	.000	
Moderate Risk**	.571	.089	41.012	1	.000	1.770
High Risk**	.821	.097	70.948	1	.000	2.272
% Crim	-.004	.003	2.333	1	.127	.996
Constant	.078	.291	.073	1	.788	1.082

Model x^2=167.977, -2 Log Likelihood=4343.261, Pseudo R^2= .050 to .067, **p≤.001, *p≤.01

Table A60. Technical Violations and Primary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.634	.164	15.031	1	.000	.530
Race	.065	.075	.747	1	.388	1.067
Age	-.009	.004	5.233	1	.022	.991
Sex Offender	.334	.366	.835	1	.361	1.397
Drug**	.518	.095	29.852	1	.000	1.678
Assault*	.221	.082	7.260	1	.007	1.248
Low- ref.			60.223	2	.000	
Moderate**	.484	.092	27.960	1	.000	1.623
High**	.765	.099	59.510	1	.000	2.148
Pri.1- ref			19.772	4	.001	
Primary 2**	.379	.104	13.182	1	.000	1.460
Primary 3**	.313	.093	11.318	1	.001	1.367
Primary 4	.090	.121	.559	1	.455	1.094
Primary 5	.012	.159	.006	1	.937	1.013
Constant	-.901	.191	22.192	1	.000	.406

Model x^2=181.205, -2 Log Likelihood=4274.945, Pseudo R^2= .055 to .073, **p≤.001, *p≤.01

Table A61. Arrest and Primary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.477	.190	6.302	1	.012	.621
Race	-.151	.082	3.381	1	.066	.860
Age**	-.025	.004	32.821	1	.000	.975
Sex Offender	-.413	.496	.694	1	.405	.661
Drug	.231	.107	4.713	1	.030	1.260
Assault	.047	.091	.263	1	.608	1.048
Low- ref			38.838	2	.000	
Moderate**	.448	.105	18.371	1	.000	1.566
High**	.689	.111	38.726	1	.000	1.991
Pri. 1- ref.			2.797	4	.592	
Primary 2	.111	.113	.957	1	.328	1.117
Primary 3	.112	.101	1.224	1	.269	1.118
Primary 4	.104	.130	.631	1	.427	1.109
Primary 5	-.109	.178	.374	1	.541	.897
Constant	-.592	.211	7.882	1	.005	.553

Model x^2=108.918, -2 Log Likelihood=3776.140, Pseudo R^2= .033 to .047, **p≤.001, *p≤.01

Table A62. Incarceration and Primary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.628	.163	14.922	1	.000	.534
Race	.097	.075	1.659	1	.198	1.102
Age	-.009	.004	5.499	1	.019	.991
Sex Offender	.312	.366	.729	1	.393	1.367
Drug**	.521	.095	30.319	1	.000	1.683
Assault	.204	.082	6.153	1	.013	1.226
Low- ref			64.301	2	.000	
Moderate**	.514	.091	31.538	1	.000	1.672
High**	.787	.099	63.097	1	.000	2.198
Pri. 1- ref.			21.296	4	.000	
Primary 2**	.397	.104	14.477	1	.000	1.488
Primary 3**	.324	.093	12.112	1	.001	1.383
Primary 4	.092	.121	.583	1	.445	1.097
Primary 5	.027	.158	.029	1	.864	1.027
Constant	-.892	.191	21.787	1	.000	.410

Model x^2=185.117, -2 Log Likelihood=4273.582, Pseudo R^2= .056 to .075, **p≤.001, *p≤.01

Table A63. Any Recidivism and Primary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.577	.157	13.494	1	.000	.562
Race	.058	.075	.583	1	.445	1.059
Age*	-.012	.004	9.886	1	.002	.988
Sex Offender	.100	.366	.074	1	.785	1.105
Drug**	.454	.093	23.874	1	.000	1.575
Assault	.134	.082	2.672	1	.102	1.144
Low- ref.			76.196	2	.000	
Moderate**	.578	.090	41.032	1	.000	1.783
High**	.844	.099	72.841	1	.000	2.326
Pri. 1- ref.			16.361	4	.003	
Primary 2*	.296	.105	7.971	1	.005	1.345
Primary 3**	.312	.094	11.049	1	.001	1.366
Primary 4	.009	.121	.006	1	.937	1.010
Primary 5	.050	.157	.100	1	.752	1.051
Constant	-.415	.189	4.807	1	.028	.660

Model x^2=177.155, -2 Log Likelihood=4245.052, Pseudo R^2= .054 to .072, **p≤.001, *p≤.01

Table A64. Technical Violations and Secondary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.582	.168	12.050	1	.001	.559
Race	.080	.074	1.145	1	.285	1.083
Age	-.008	.004	3.939	1	.047	.992
Sex Offender	.320	.367	.760	1	.383	1.377
Drug**	.519	.094	30.219	1	.000	1.680
Assault*	.224	.082	7.477	1	.006	1.251
Low- ref.			58.586	2	.000	
Moderate**	.469	.091	26.319	1	.000	1.598
High**	.752	.099	58.068	1	.000	2.122
Sec. 1- ref			6.151	4	.188	
Secondary 2	.189	.198	.912	1	.340	1.208
Secondary 3	-.022	.196	.012	1	.912	.979
Secondary 4	.107	.193	.306	1	.580	1.113
Secondary 5	.222	.202	1.216	1	.270	1.249
Constant	-.886	.263	11.335	1	.001	.412

Model x^2=167.504, -2 Log Likelihood=4288.645, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01

Table A65. Arrest and Secondary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex	-.456	.195	5.482	1	.019	.634
Race	-.146	.082	3.219	1	.073	.864
Age**	-.025	.004	31.616	1	.000	.976
Sex Offender	-.386	.498	.600	1	.439	.680
Drug	.234	.106	4.825	1	.028	1.263
Assault	.049	.091	.293	1	.588	1.050
Low- ref.			37.868	2	.000	
Moderate**	.440	.105	17.709	1	.000	1.553
High**	.680	.111	37.779	1	.000	1.973
Sec. 1-ref.			6.560	4	.161	
Secondary 2	.068	.222	.093	1	.761	1.070
Secondary 3	-.149	.222	.452	1	.501	.862
Secondary 4	.085	.217	.154	1	.695	1.089
Secondary 5	.131	.226	.334	1	.563	1.140
Constant	-.584	.294	3.950	1	.047	.558

Model x^2=112.766, -2 Log Likelihood=3772.292, Pseudo R^2= .034 to .049, **p≤.001, *p≤.01

Table A66. Incarceration and Secondary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.568	.167	11.604	1	.001	.567
Race	.111	.075	2.205	1	.138	1.117
Age	-.008	.004	4.007	1	.045	.992
Sex Offender	.308	.367	.705	1	.401	1.361
Drug**	.521	.094	30.701	1	.000	1.684
Assault	.208	.082	6.434	1	.011	1.231
Low- ref.			62.187	2	.000	
Moderate**	.496	.091	29.556	1	.000	1.642
High**	.772	.099	61.261	1	.000	2.165
Sec. 1- ref.			6.503	4	.165	
Secondary 2	.242	.198	1.495	1	.221	1.274
Secondary 3	.011	.196	.003	1	.956	1.011
Secondary 4	.154	.193	.635	1	.426	1.166
Secondary 5	.238	.202	1.393	1	.238	1.269
Constant	-.912	.263	12.014	1	.001	.402

Model x^2=170.227, -2 Log Likelihood=4288.472, Pseudo R^2= .052 to .069, **p≤.001, *p≤.01

Table A67. Any Recidivism and Secondary Needs Scale (N=3217)

Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
Sex**	-.533	.161	10.896	1	.001	.587
Race	.076	.075	1.026	1	.311	1.079
Age*	-.011	.004	8.284	1	.004	.989
Sex Offender	.072	.366	.039	1	.844	1.075
Drug**	.451	.093	23.702	1	.000	1.569
Assault	.135	.082	2.716	1	.099	1.145
Low- ref.			75.559	2	.000	
Moderate**	.568	.090	39.811	1	.000	1.765
High**	.840	.099	72.585	1	.000	2.317
Sec. 1- ref.			6.264	4	.180	
Secondary 2	.235	.196	1.436	1	.231	1.265
Secondary 3	.034	.193	.032	1	.859	1.035
Secondary 4	.087	.191	.207	1	.649	1.091
Secondary 5	.252	.200	1.589	1	.207	1.287
Constant	-.442	.260	2.878	1	.090	.643

Model x^2=166.955, -2 Log Likelihood=4255.212, Pseudo R^2= .051 to .068, **p≤.001, *p≤.01