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Post-treatment drug use, recidivism, analogous behaviors, and perceptions of fairness:

Examining whether parolees with low self-control will benefit from the Collaborative Behavioral

Management intervention

by

Sriram Chintakrindi

A dissertation submitted to the Graduate faculty in Criminal Justice in partial fulfillment of the
requirement for the degree of Doctor of Philosophy

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ABSTRACT

Post-treatment substance use, recidivism, analogous behaviors, and perceptions of fairness:

Examining whether parolees with low self-control will benefit from the Collaborative Behavioral

Management intervention

by

Sriram Chintakrindi

Adviser: Jeremy Porter

This dissertation tested Gottfredson and Hirschi's (1990) low self-control theory and its

relationship with post-treatment outcomes by conducting a secondary-data analysis of a

randomized controlled trial on parolees (n=569) called the Step'n Out study (2005). The Step'n

Out study (2005) compared the results of a control group (standard parole) with an experimental

treatment for parolees called the Collaborative Behavioral Management (CBM) intervention

which was designed to improve substance-use treatment outcomes, reduce drug use, and reduce

recidivism for parolees participating in the study.

Low self-control theory states that individuals with character traits that are impulsive,

risk-seeking, self-centered, and display volatile temper have a high likelihood of engaging in

criminal and analogous (i.e. risky sexual practices) behaviors. Gottfredson and Hirschi's (1990)

theory makes the assumption that these traits are the result of parental socialization practices, are

not able to be changed after the age of 8 or 10, and are stable across time. In order to measure

low self-control for the present study, an exploratory factor analysis was conducted on 20 self-

report items collected at intake from the parolees in the study and a unidimensional measure of

low self-control was constructed. Based on low self-control theory, this study hypothesizes that

parolees who self-report engaging in substance use, recidivism, and analogous behaviors after the end of the treatment intervention at the 3 and 9 month follow-up periods will have low self-control traits (measured at intake). Also based on the theory, this study hypothesizes that the treatment condition (control group vs. CBM group) will not moderate the relationship between low self-control traits and post-treatment outcomes even when controlling for demographic, risk-factors, peer-associations, and treatment dosage. The exploratory results from this study were reported using univariate, bivariate, and multivariate statistics. Also a confirmatory factor analysis was conducted to measure the direct and indirect effects of low self-control, peer-associations, and perceptions of fairness on post-treatment outcomes.

The results from this dissertation study largely indicate that parolees across the self-control spectrum (low to high levels of self-control) are engaging in post-treatment outcomes (substance use, recidivism, and analogous behaviors) at the 3 and 9 month follow-up periods even when controlling for age, gender, race, age at first arrest, education status, dosage levels, and treatment condition. Therefore, based on the findings from this study, low self-control theory does not allow researchers to understand the causal mechanisms by which post-treatment outcomes occur for parolees. More theoretical refinement of the theory or alternative theories are needed in order to explain the post-treatment outcomes of parolees participating in the Step'n Out study. However, a particularly interesting finding that also has strong public policy implications indicates that parolees that self-reported physically or verbally threatening someone at both the 3 and 9 month follow-up periods had statistically significant lower mean levels of self-control compared to parolees who did not physically or verbally threaten someone.

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Chapter 1

Introduction

The Bureau of Justice Statistics (2011) dataset on correctional populations states that there has been 275% increase in the probation and parole population from the year 1980 to the year 2009. The ever-increasing demands placed on the criminal justice system for maintaining the security of communities across the nation and to manage offenders during and after incarceration poses multifaceted challenges that requires evidence based practices built on firmly developed theoretical foundations (Cullen et al., 2009). Therefore, it is crucial that researchers identify evidenced based rehabilitation and treatment modalities that can integrate with existing criminal justice infrastructure such as parole or probation to manage and reduce offender risk for recidivism and drug use in the community (Feeley and Simon, 1992).

This dissertation study tested Gottfredson and Hirschi's (1990) low self-control theory and its relationship with post-treatment outcomes by conducting a secondary-data analysis of a randomized controlled trial on parolees (n=569) called the Step'n Out Study (2005). The Step'n Out study (2005) compared the results of a control group (standard parole) with an experimental treatment for parolees called the Collaborative Behavioral Management (CBM) intervention which was designed to improve substance-use treatment outcomes, reduce drug use, and reduce recidivism for parolees participating in the study. This dissertation study examined the relationship between parolees' self-control levels measured at intake and post-treatment outcomes related to drug use, recidivism, analogous behaviors, deviance, and perceptions of fairness at both a 3 and 9 month follow-up period. This dissertation study also examined whether

the CBM intervention was able to moderate the relationship between self-control and post-treatment outcomes.

Policies and Perspectives Guiding Offender Rehabilitation

There exist a number of conflicting policies and perspectives guiding how offenders with high-risks, or analogously, low self-control should be managed by the criminal justice system. This section will begin by describing how conflicting policies on drug rehabilitation effects the post-treatment recidivism and substance use outcomes for offenders upon being released into the community. Next, the causal mechanisms of criminal behavior will be discussed through the diverging theoretical perspectives of Gottfredson and Hirschi (1990) Low Self-Control theory and Andrew's (1990) Psychology of Criminal Conduct. Finally, this section will end with a discussion on the relationship between low self-control, procedural justice, and how both paradigms claim to be related to post-treatment outcomes for offenders involved in criminal justice managed treatment interventions.

Until drug laws are reformed, illegal drug use in the community will continue to be a major contributor to crimes that lead to incarceration and subsequent parole revocations (Friedmann et al., 2011). Friedmann et al. (2011) states that over 700,000 inmates exit prison annually and that two-thirds of inmates reentering society have drug problems (p. 1099). If drug problems are left untreated or unmonitored by substance abuse counselors this can result in relapse or rearrest of released prisoners. It is reported that drug use results in reincarceration of more than half of inmates within three years of their release (Friedmann et al., 2011, p. 1099). Also individuals who were violated for failure of their terms of probation or parole are the fastest growing group of offenders in the prison system as a result of failure to attend treatment, failed drug tests, or re-arrest (Langton, 2006; Friedmann et al., 2008). Mears et al. (2000) reports that

only 61 percent of state correctional facilities provide substance abuse treatment. Friedmann et al. (2008) reports that only 13% to 32% of drug-addicted offenders receive drug addiction treatment while in prison (p. 291). These descriptive statistics demonstrate the asymmetry between the known causes of recidivism presented by research and the availability of resources in the criminal justice system for managing offender risk for reincarceration, particularly drug-use.

The public health and criminal justice costs associated with illegal drug use by individuals receiving parole poses a serious threat to the stability of individual lives, families, and communities. Parolees reentering society after a period of incarceration are expected to reestablish ties to their community, obtain housing and jobs, adhere to parole mandates, and manage drug-addictions or risk being violated and returned to prison (Lipsey and Cullen, 2007; Friedmann et al., 2008; Friedman et al., 2009). The multiple responsibilities imposed by the criminal justice system through intermediary sanctions and supervision upon parolees who have been temporarily disconnected from society for varying lengths of time due to incarceration can prove to be overwhelming, unrealistic, and disorienting for former inmates. Also the lack of guidance, medical services, discharge planning, and community resources that are available for former inmates during the reentry process not only increases their risk for recidivism but also increases the overall healthcare and corrections costs for communities with high concentrations of offenders (Mellow and Greifinger, 2006).

Conflicting Perspectives Between Low Self-Control and Rehabilitation

These facts about the reentry process continue to place demands on researchers and practitioners for developing innovative and cost-effective interventions for managing offender risk in the community (Cullen et al., 2009). However, it remains unclear whether a particular

subset of individuals regardless of how much time and money is placed in to monitoring and treating them through evidence based practices will benefit from the rehabilitation framework. It is essential that researchers continue to refine their methods for identifying offenders that will benefit the most and benefit the least from rehabilitation programs and substance abuse treatment, because the incongruous matching of intensive treatments with offenders with low self-control traits can result in the misappropriation of resources, and in some cases, it may result in harm to the offender (Bonta & Andrews, 2007; Abdel-Salam, 2011).

The science of designing effective reentry programs has culminated in four guiding principles for producing effective corrections interventions for reducing recidivism (Latessa, 2008). These four guiding principles for effectively rehabilitating individuals with criminal propensities include: target high-risk offenders, target criminogenic needs, use evidence-based-practices for designing rehabilitation interventions, and implementing the intervention requires a strong evaluation process. Latessa (2008) states that research studies have been consistent in revealing that reentry programs that fail to adhere to these four known characteristics have a low probability of reducing recidivism for high-risk offenders.

Arguably the most important principle of effective rehabilitation is a question of 'who to target?' Effective intervention programs should be able to identify and target high-risk offenders for services. Previous research has demonstrated that low-risk offenders receiving services through an intensive intervention will increase their rates of recidivism. This occurs either because the illegal behaviors of low-risk offenders are more likely to be detected due to the intensive nature of the intervention and supervision or because the intervention is doing more harm than good for low-risk offenders (Latessa, 2008; Cullen et al., 2009; Friedmann et al., 2009; Andrews and Bonta, 2010).

Initial research for identifying individuals who are at high-risk for recidivating found a number of static risk-factors that are correlated with reoffending. These factors include age at first offense, membership in an ethnic minority group, prior incarceration, poor school performance, conviction of a property crime, and general severity of offense (Langton, 2006; Lipsey and Cullen, 2007). However, Langton (2006) described these static risk-factors as being largely atheoretical. Research on static risk-factors for actuarial purposes was successful in contributing to the development of risk assessments that could accurately predict an offenders risk for recidivism but lacked a theoretical foundation for explaining the causal mechanisms that produced risk. The expanding body of knowledge for methodologically predicting risk based on known static risk-factors was not effectively linked to any general theoretical model of crime causation (Langton, 2006) until Gottfredson and Hirschi (1990) proposed their self-control theory which provided a framework for a general theory of individual-level crime causation based on characteristics of the offender that became static and stabilized after the age of 8. The development of self-control theory offered a conceptual understanding of how static traits formed early in life are predictive of criminal or deviant behavior throughout the life course.

Contemporary empirical research on the measurement of risk is largely focused on dynamic risk-factors or "criminogenic needs" that are responsive to treatment. Recent research has found that treatment interventions that address "risk, need, and responsivity" have a large potential for reducing recidivism (Bonta et al., 2006). Factors such as an individual's "criminogenic needs" or dynamic risk-factors are strongly correlated with reoffending and research has found that they have the capacity to be changed through effective treatments unlike static risk-factors which are unresponsive to treatment. The "criminogenic needs" that have been identified by researchers include procriminal attitudes, values and beliefs, deviant associates,

antisocial personality characteristics, and self-control (Langton, 2006; Andrews and Bonta, 2010). Lipsey and Cullen (2007) discuss how the "need principle" states that treatment demonstrates the largest effects when it targets criminogenic needs or the dynamic risk factors of the offender. The "responsivity principle", identifies effective treatments that the offender requires in order to reduce their criminal behaviors. The "responsivity principle" matches treatments to offenders based on the learning styles and characteristics of the offender (Lipsey and Cullen, 2007; Andrews and Bonta, 2010). Research has shown that higher-risk offenders require more treatment and demonstrate the most improvement when receiving effective treatments (Lipsey and Cullen, 2007).

Self-control has been identified by Andrews and Bonta (2010) as a "criminogenic need" or dynamic risk-factor, which directly contradicts the assumptions of Gottfredson and Hirschi's (1990) self-control theory, which argues that self-control traits are stabilized after the age of 8 and are, therefore, unresponsive to treatment interventions (Gottfredson and Hirshi, 1990; Langton, 2006). Andrews (1995) responds directly to Gottfredson and Hirschi's (1990) low self-control theory and particularly to the concept of trait stability by stating:

> "We must resist, however, those personality theorists who have become so enamoured of the well documented stability of individual differences in antisocial behaviour that they flirt with denial of the possibility of change (e.g Gottfredson and Hirschi, 1990)".

According to Gottfredson and Hirschi's (1990) self-control theory, self-control traits are a set of static-factors that are highly predictive of failed socialization and criminal behaviors throughout the life course. Bonta et al. (2006) argue that individuals characterized as being low in self-control (e.g. high-risk for recidivism) can have their traits changed and recidivism reduced by building an offender's problem-solving skills, self-management skills, and anger

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management and coping skills through treatment interventions that address the "need principle" and "responsivity principle". Therein lies the crux of the problem between the two competing criminological theoretical orientations, one side argues that individuals with low self-control are amenable to change through rehabilitation based interventions and the other side argues that individuals characterized as having low self-control remain predisposed to criminal and deviant behaviors across the lifespan regardless of how much time, money, and treatment is placed into rehabilitating them. Does this problem apply only to a subset of offenders? Gottfredson and Hirschi (1990) would argue that anyone regardless of race, class, or gender measured as having low self-control would continue to demonstrate patterns of failed socialization and criminal behavior even after receiving a treatment intervention. On the other hand, Lipsey and Cullen (2007) and Andrews et al. (1990) would argue based on the risk-principle that an effective intervention produces the largest effects for higher-risk offenders, because higher risk cases have the most room for improvement.

The static and dynamic risk-factors that have been identified through research studies has allowed researchers to produce risk-assessment instruments for practitioners to utilize when creating targeted interventions for offenders being screened for admission into rehabilitation programs as a condition of their parole (Andrews and Bonta, 2010). The dynamic risk-factors are of particular interest to both researchers and practitioners because of their ability to be changed. Also it is equally as important to understand the type of rehabilitation programs and treatment modalities that exist that can facilitate the dynamic risk-factors to change, because not all rehabilitation programs are built on the same theoretical foundations and implemented equally or effectively.

Resolving the debate over which risk-factors are static and dynamic not only saves tax-payer dollars when screening and targeting individuals for particular interventions, it also provides greater security for our communities, by allowing the criminal justice system to incapacitate or intensively monitor offenders who are predicted to be unresponsive to rehabilitation and treatment interventions. Distinguishing the conditions under which risk-factors such as self-control are either static or dynamic has eluded researchers because of contradicting research findings and theoretical orientations (Gottfredson and Hirschi, 1990; Bonta et al., 2006). Understanding what types of treatment interventions, if any, are capable of altering self-control traits is critical for reducing recidivism and drug use.

Gottfredson and Hirschi's (1990) self-control theory predicts that the very individuals who fail to attend mandated services, appear disengaged, or appear resistant to treatments otherwise proven effective to reduce recidivism simply have personality, behavioral, and cognitive characteristics that are distinguishable and that would cause them to fail regardless of the empirical success that the treatment intervention has had for other offenders. It may not always be a question of implementation and program failure when treatment appears ineffective, but a question of which static-factors related to the personality, behavior, or cognitive characteristics of the offender that preclude them from successfully completing any intervention provided to them by the criminal justice system. Self-control theory would argue that there are certain individuals that will consistently remain unresponsive to treatment regardless of how well the treatment is implemented and those are individuals with low self-control.

Conflicting Perspectives Between Low Self-Control and Procedural Justice

Self-control is the ability to regulate one's own behavior and is directly linked with patterns of criminal offending (Gottfredson and Hirschi, 1990; Reisig et al., 2011). On the other

hand the procedural justice paradigm posits that an individual's perceptions of fairness regarding their treatment by the authorities, such as police or parole officers, effects their decisions to abide by the law or to dismiss it.

Tyler (2003) developed the process-based model of regulation to demonstrate how the police and courts gain the long-term compliance and obedience of the public. The process-based model is also concerned with how the legal system functions through the use of laws and police enforcement to gain compliance. Public cooperation is essential for the police to enforce and uphold the law. Therefore, a legal system that fails to garner the support of the public will be perceived by the public as an illegitimate authority. The process-based model argues that the publics' subjective evaluation of the fairness of legal processes and police procedures determines whether the public will decide to obey or disobey the law and police. The public's decision to comply with the law is argued to be linked to procedural justice or perceptions of fairness, rather than, individual-levels of self-control.

Tyler (2003) argues that an individual's legal orientation (perceptions of legitimacy or legal cynicism towards authority) is tied to psychological evaluations of treatment by the authorities. Tyler's (2003) research states that an individual's legal orientation is the strongest predictor of offending behavior. Individuals' with cynicism and anger towards authorities tied to the justice system, have a higher likelihood of offending compared to individuals who perceive the authorities as legitimate agents of justice. The Step'n Out study's Collaborative Behavioral Management intervention relies heavily on the principle of procedural justice in the design of its treatment design. In particular, the Step'n Out study emphasizes the building of therapeutic alliances between parolees, parole officers, and treatment counselors for increasing parolees' perceptions of fairness. Procedural justice theory hypothesizes that strong therapeutic alliances

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result in reductions in post-treatment offending and deviance (Tyler, 2003; Friedmann et al., 2008).

Therefore, understanding the relationship between self-control traits and procedural justice in the context of an experimental treatment design is critical to understanding and developing effective rehabilitation interventions and for reducing offending behavior. Also, conclusively determining whether self-control is a static or dynamic factor has major implications for the effectiveness of criminal justice sanctions such as parole or probation. If self-control is dynamic and can be influenced by rehabilitation interventions, then arguably the offender's legal orientation towards the criminal justice system can also be altered in a direction more favorable to the greater good of society. By increasing offenders' perceptions of legitimacy and fairness of the criminal justice system through the development of therapeutic relationships rather than through producing adversarial relationships between law-enforcement and parolees may lead to reductions in recidivism.

Research Questions and Hypotheses

This study will be exploring the relationship between low self-control traits and post-treatment outcomes related to substance use, recidivism, analogous behaviors, and perceptions of fairness. The primary hypothesis being put forward in this study is that parolees with low self-control traits will have increased odds of engaging in deviant behaviors. Also, parolees with low self-control are hypothesized to have decreased perceptions of fairness. This study will also examine the moderating effect that the treatment intervention has between low self-control and post-treatment outcomes. Based on Gottfredson and Hirschi's (1990) low self-control theory, the present study hypothesizes that the treatment intervention will not be able to effect the relationship between low self-control and post-treatment outcomes.

More specifically, the study seeks to understand whether the post-treatment outcomes and behaviors of parolees participating in the Step'n Out study's examination of the Collaborative Behavioral Management (CBM) intervention can be explained by Gottfredson and Hirschi's (1990) low self-control theory. The present study hypothesizes that low self-control can explain the self-reported post-treatment substance use, recidivism, and analogous behaviors of parolees randomized to both the treatment group (CBM intervention) and the control group (standard parole). The present study also hypothesizes that the CBM treatment intervention will not have a moderating effect on self-reported post-treatment substance use, recidivism, and analogous behaviors at the 3 and 9 month follow-up periods because Gottfredson and Hirschi (1990) argue that criminal justice interventions and rehabilitation programs are unlikely to alter self-control levels.

Also this study seeks to understand whether the parolees' self-reported "perceptions of parole officer/ counselor fairness" can be explained by Gottfredson and Hirschi's (1990) low self-control theory. The present study hypothesizes that assessments of procedural justice are effected by low self-control traits. Therefore, individuals with low self-control are predicted to have lower assessments of fairness compared to individuals with higher levels of self-control. The present study also hypothesizes that the treatment intervention will not moderate the relationship between low self-control and "perceptions of parole officer/ counselor fairness" because previous research found that individuals with low self-control are more likely to have hostility, resentment, and cynicism for all aspects of the criminal justice system including the rehabilitation framework (Piquero et al., 2004; Langton, 2006; Reisig et al., 2011).

This study will conclude by seeking to understand the strength of the relationships between the self-control and peer-association factors and their direct effect on the perceptions of

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fairness factor while controlling for age, race, gender, age at first arrest, high school completion status, divorce status, dosage data, and treatment condition. The present study hypothesizes that individuals with lower levels of self-control will have lower levels of perceptions of fairness when compared to the peer-association factor while controlling for demographic, risk-factor, and treatment condition variables. A confirmatory factor analysis will be conducted because this technique will allow for the measurement of the magnitude and direction of specific effects on the latent constructs self-control and peer-associations through "perceptions of fairness" while controlling for demographic, risk-factor, dosage data, and treatment condition variables. Also this model will allow the researcher to predict the effects of the three latent constructs on post-treatment outcomes using a recursive model structure while controlling for risk, demographic, treatment dosage, and treatment condition variables.

Chapter 2

Literature Review

The goal of this chapter is to review the assumptions and previous research findings related to Gottfredson and Hirschi's (1990) low self-control theory and Tyler's (2003) process-based model of procedural justice. Low self-control and procedural justice will be conceptually linked to the theoretical foundations and post-treatment outcomes of the Collaborative Behavioral Management (CBM) intervention. The topics that will be covered in this chapter include: (a) low self-control theory, (b) the unidimensionality of low self-control, (c) the assumptions of low self-control theory, (d) low self-control as a predictor of substance use, offending behavior, and parole failure, (d) low self-control as a predictor of analogous behaviors, (e) the relationship between low self-control and procedural justice, (f) low self-control and rehabilitation, and (g) a statement of the problem guiding the research questions for this present study.

Low Self-Control Theory

Self-control theory argues that stable individual differences in criminal behavior are the result of self-control. Gottfredson and Hirschi (1990) state that their decision to argue that self-control is the underlying factor responsible for all criminal and deviant behaviors was based on the consistency between the classical schools conception of crime being a product of pursuing self-interested behavior through fraud and force and their conception of the criminal being an individual who has unstable relationships, pursues risk-taking behaviors, has a volatile temperament, inability to delay gratification, and the inability to weigh the costs associated with their behaviors (Gottfredson and Hirschi, 1990).

According to Gottfredson and Hirschi (1990), the personality characteristics of an individual with low self-control are a reflection of the nature of criminal and deviant acts. Criminal acts often instantly gratify offenders, particularly in the cases of drug use, theft, and violence, which neuropsychological researchers have linked to the neuronal correlates of behavior and consciousness (Kelley and Berridge, 2002; Seo and Patrick, 2008). Furthermore, neuropsychological research has demonstrated that drug use and addiction are related to dysregulation of the human brain's mesolimbic reward system and the excessive release of dopamine and other neurotransmitters that facilitate repetitive behaviors that are associated with preferences for pleasure and gratification. However, Gottfredson and Hirschi (1990) do not account for how the extant literature has further linked the development of personality and behavioral characteristics related to impulsivity and aggression with neurophysiological genetic defects, congenital disorders, disease, or injury to the amygdala and executive regions of the cortex (Kelley and Berridge, 2002; Seo and Patrick, 2008; Ersche et al., 2010). Gottfredson and Hirschi (1990) assume that low self-control traits can be primarily attributed parental socialization practices and do not specifically address the relationship between macro-level poverty indicators and individual-level self-control traits. Farah et al. (2006) investigated the relationship between poverty, brain development, and corresponding cognitive characteristics among a sample of African-American children with varying socio-economic backgrounds. Farah et al. (2006) found that there were significant differences in cognitive outcomes related to socio-economic status. More specifically, African-American children from low socio-economic backgrounds had significantly lower mean scores on numerous neuropsychological tests that assess cognitive ability.

Furthermore, Gottfredson and Hirschi (1990) state that individuals characterized as having low self-control are unable to delay gratification and are easily susceptible to stimuli in their immediate environment (p. 89). Criminal acts and its analogous behaviors offer instant gratification through easy and simple means such as taking money without working, having sex without commitment, and settling disputes through violence instead of through the court system or other time-consuming methods of resolution (Gottfredson and Hirschi, 1990, p. 89). According to Gottfredson and Hirschi (1990) criminal acts often provide a sense of excitement and or riskiness for the offender. A criminal act requires the criminal to be deceitful and also requires them to maneuver swiftly and stealthily which provides excitements and thrills (Gottfredson and Hirschi, 1990, p. 89). Ferrell (1997) conducted criminological field research on graffiti artists in New York City and confirms through the qualitative analytical process of in-depth interviews and ethnography that the assumption of engaging in criminal behavior is in fact exciting and does provides a "remarkably powerful rush of adrenaline and fear (p. 5)." Individuals with low self-control tend to be attracted to adventurous situations. Gottfredson and Hirschi (1990) state that individuals with higher levels of self-control are better able to assess risks and act cautiously compared to individuals with lower levels of self-control. Criminal acts do not require high levels of education, skill specialization, or detailed planning. Furthermore, committing crime does not require superior intelligence or cognitive abilities. Crime does not require manual skills that are acquired through apprenticeships or training (Gottfredson and Hirschi, 1990).

Criminal acts often cause suffering, pain, or injury to victims. Individuals with low self-control are characterized as being self-centered because they fail to take into consideration the long-term consequences of their actions and how their pursuit of self-interested behaviors effects

other individuals and the larger community. Criminal acts require violating trust, exploiting

weaknesses in acquaintances or strangers, and violating privacy in order to complete the crime

even without any certainty of success (Gottfredson and Hirschi, 1990, p. 89). However, this does

not imply that individuals with low self-control are ruthless and anti-social. In fact individuals

with low self-control will adopt charm and generosity to further their criminal interests

(Gottfredson and Hirschi, 1990, p. 90).

Gottfredson and Hirschi (1990, p. 15) distinguish between crime and criminality. Crime

is operationalized as being an act "of fraud or force undertaken in pursuit of self-interest",

whereas, criminality is a measure of an individual's propensity to engage in crime (Grasmick et

al., 1993). Low self-control encompasses criminality and also the propensity to engage in non-

criminal behaviors that are seen as socially inappropriate, irresponsible, or life-threatening.

Based on the writings of the utilitarian philosopher Jeremy Bentham, Gottfredson and Hirschi's

(1990) discussion of the "self-interest" involved in committing crime is equal to the pursuit of

pleasure. Traditionally the definition of crime is based on the political sanctioning system, but

ignores definitions provided by three other sanctioning systems such as the physical, moral, and

religious systems. Gottfredson and Hirschi (1990) deliberately avoid defining crime by legal or

politically motivated agendas and instead acknowledge that crime is relative to time, space, and

location and is likely to evolve with the needs or demands of society (Grasmick et al., 1993). By

defining crime as a fraud or force undertaken for self-interest, Gottfredson and Hirschi (1990)

are able to produce a general theory based on the interaction of low self-control and opportunity

that can explain crime that occurs by adolescents and adults in any socio-economic class level,

race, gender, age group, society, culture, or historical period (Grasmick et al., 1993).

Self-control theory is a general theory of crime that uses two key concepts to explain crime, criminal behaviors, and analogous behaviors "across time (i.e., history), place (i.e., culture), and groups (e.g., gender, race, and class) (Arneklev, 1998, p. 109)." Arneklev et al. (1998) discuss how the interaction of an individual with low self-control traits and having the opportunity to commit a crime will increase the relative risk of that individual engaging in a criminal act through either fraud or force (Gottfredon and Hirschi, 1990). Without proper empirical validation the researchers argue that until the age of eight or ten, levels of self-control remain dynamic. However, the theory states that after the age of eight or ten self-control stabilizes and becomes a stable and enduring characteristic of an individual (Gottfredson and Hirschi, 1990; Turner and Piquero, 2002).

Criminal opportunity is one of the least developed parts of Gottfredson and Hirschi's (1990) self-control theory. Low self-control theory assumes that criminal opportunity has its own distinct main-effect on criminal behavior separate from self-control. Gottfredson and Hirschi (1990) argue that an interaction of low self-control and opportunity to engage in crime is a required condition for criminal behavior to emerge. Individuals with low self-control that have the opportunity to commit a crime are probabilistically more likely to engage in the crime than individuals with higher levels of self-control confronted with the same opportunity (Gottfredson and Hirschi, 1990; Grasmick et al., 1990). Crime opportunity is hypothesized to be similar to self-control in terms of between individual level variance. However, Grasmick et al. (1993) specifically note that Gottfredson and Hirschi's (1990) failure to operationalize crime opportunity leaves low self-control theory vulnerable in debates of its primacy as a major cause of crime.

Detractors of generalized criminological theories argue that the problem of crime is intractable because crime does not exist in vacuum isolated from market forces, technological developments, and political ideological discourse. Furthermore, Knepper (2007) discusses how the prominent criminologist Sir Leon Radzinowicz, the founding director of the Institute of Criminology at the University of Cambridge, argues that any attempt to isolate a single cause of crime (e.g. low self-control) was a waste of time. Furthermore, Knepper (2007) discusses how Radzinowicz was skeptical of abstract over-arching crime theories. Instead, Radzinowicz promoted a multidisciplinary approach to understanding crime by working with teams of sociologists, statisticians, psychiatrists, and legal specialists to study criminality and deviance.

The Unidimensionality of Low Self-Control Theory

Gottfredson and Hirschi (1990) summarize the characteristics of an individual with low self-control as having traits that are impulsive, self-centered, risk-taking, preference for physical activities, preference for simple tasks, display volatile tempers, unconcerned about long-term consequences of their actions, and are unable to delay gratification. Individuals with these traits can be unidimensionally characterized as having low self-control and are predicted to commit crimes involving fraud, force, and analogous behaviors related to abusing drugs, drinking, smoking, gambling, and illicit sex (p. 90).

Grasmick et al. (1993) hypothesize that low self-control is composed of six components which unidimensionally align to produce a single measure of latent low self-control traits based on the detailed descriptions provided by Gottfredson and Hirschi (1990) for operationalizing and measuring low self-control. The first component is impulsivity, which is described as being focused on the "here and now" and unable to consider long-term consequences of actions or

behaviors compared to individuals with higher levels of self-control that can delay gratification (Grasmick et al., 1993).

The second component is a preference for simple tasks. Gottfredson and Hirschi (1990, p. 89) describe this as being concentrated in individuals who "lack diligence, tenacity, or persistence in the course of action" and are unwilling to participate in tasks that are complex because those individuals seek out activities that provide instant gratification and that are easy (Grasmick et al., 1993). The third component, describes individuals with a preference for engaging in activities that are risk-taking, thrill seeking, and adventuresome. This is referred to as risk-seeking.

The fourth component of self-control is related to the avoidance of cerebral or cognitive related activities in favor of physical activities. This component is a measure of preference for physical activities. The fifth component is a measure of self-centeredness which is described by Gottfredson and Hirschi (1990) as an individual's insensitivity towards the suffering that others experience and performing self-interested behaviors that aim to benefit only themselves. The sixth and final component is a measure of temper, which Gottfredson and Hirschi (1990, p. 90) state "people with low self-control tend to have minimal tolerance for frustration and little ability to respond to conflict through verbal rather than physical means".

These six components provide the foundations for operationalizing and measuring low self-control and its ability to predict dependent variables related to criminal behaviors and non-criminal (analogous) behaviors such as willingness to "smoke, drink, use drugs, gamble, have children out of wedlock, and engage in illicit sex" (Gottfredson and Hirschi, 1990, p. 90; Grasmick et al., 1993, p. 9). Also Gottfredson and Hirschi (1990) assert that measurements of

low self-control should be able to predict patterns of failed socialization such as unstable friendships, divorce, and unemployment at the individual level.

Grasmick et al. (1993) developed a 24-item self-control scale which was found to have valid and reliable indicators of the six subcomponents posited by Gottfredson and Hirschi (1990) as expressing low self-control. Using factor analysis, Grasmick et al. (1993) found that the factor loadings from the self-control scale fit a one-factor model which allows researchers to use a single scale for measuring the latent unidimensional construct of self-control and which can be further used to predict criminal behaviors, analogous behaviors, accidents, and failed socialization.

Longshore (1998) used 23-items from a treatment intake assessment to measure self-control which were revisions of the items previously developed by Grasmick et al. (1993) and found that self-control can be expressed either by its six subdimensions or as single unidimensional construct where all of the items merge to express a single latent measure of the self-control factor (Grasmick et al., 1993; Arneklev et al., 1993). Nagin and Paternoster (1993) and Longshore (1998) favor the use of a one-factor index for self-control when it is assumed to be a latent construct and the purpose of the study is to test hypotheses based on theoretical propositions from Gottfredson and Hirschi's (1990) low self-control theory. Cretacci (2008) conducted a factor analysis of a 25-item self-control scale and used a one factor solution, with an alpha reliability of .78, because previous research indicates that unidimensionality exists when there is a significant drop-off in Eigen values between the first and second factors and when smaller drop-offs exists between subsequent factors (Tittle et al., 2003).

Ribeaud and Eisner's (2006) found that self-control can be expressed as a unidimensional construct composed of five sub-dimensions. The sub-dimension simple tasks can be excluded

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from the overarching construct because it does not add any explanatory power to the overall construct. Ribeaud and Eisner's (2006) also found that self-control is considered a strong predictor of both drug use and crime in the Swiss population and that Gottfredson and Hirschi's (1990) general theory has external validity for predicting individual-level criminal behavior for people not belonging to the United States. However, Ribeaud and Eisner (2006) provide a disclaimer suggesting that future research should be expanded to include additional non-western countries to determine the extent to which self-control can be claimed as a general theory across time, space, and cultures. Although a large body of literature supports the unidimensionality of low self-control, there continues to remain a considerable amount of debate regarding the operationalization, measurement, and dimensionality of low self-control (Grasmick et al., 1993; Arneklev et al., 1993; Nagin and Paternoster, 1993; Longshore, 1998; Tittle et al., 2003; Crettaci, 2008).

The Assumptions of Low Self-Control Theory

A major debate among criminological theorists is whether criminality is the result of persistent (sometimes referred to as population) heterogeneity or state dependence (Arneklev et al., 1998). According to self-control theory the concept of persistent heterogeneity would argue that criminal behavior is the result of individual level (e.g. self-control) and time stable differences that effect the propensity to commit crime which are established early in childhood development and after a certain period (ages eight or ten) remain static throughout the life course (Nagin and Paternoster, 1993; Arneklev et al., 1998). On the other hand the concept of state dependence would explain criminal behavior as being a result of the context in which the individual is situated within (i.e., the environment). For example, the state dependence perspective would argue that negative peer-associations facilitate social learning and cause

criminal behavior, rather than internal levels of self-control (Nagin and Paternoster, 1993; Akers, 1997; Arneklev et al., 1998).

Support for the persistent heterogeneity perspective states that the age of onset of engaging in crime is closely related to an individual's persistence for offending (Arneklev et al., 1998). Arneklev et al. (1998) discuss how the criminal offending patterns of individuals with low self-control closely reflect the age/crime curve. However, individuals with low self-control begin criminal offending and committing analogous behaviors earlier than the general population and continue offending well after the general population desists from committing crime in early adulthood (Arneklev et al., 1998).

Arneklev et al. (1998) discusses how the two diverging perspectives on criminal offending have different implications for low self-control theory. Finding evidence that low self-control is trait stabilized over the life-course supports the persistent heterogeneity perspective. Furthermore the persistent heterogeneity perspective has major implications for punishment policies for individuals identified as having low self-control traits entering the criminal justice system. The persistent heterogeneity perspective would argue that individuals with low self-control would not benefit from rehabilitation style treatment interventions aimed it increasing the offenders self-control levels because self-control is a stable and enduring trait that cannot be easily altered. However, if it is found that self-control traits are not stabilized over time and fluctuate as a result of environmental conditions, then the state dependence perspective is supported. The state dependence perspective has implications for punishments policies that would support rehabilitation style programming for offenders entrenched in the criminal justice system, because peer-associations and self-control can be modified through criminal justice interventions.

It is important that researchers continue to examine whether self-control is trait stabilized early in life or whether self-control characteristics are capable of being altered in the direction of higher levels in order to reduce offending behaviors. However, contrary to the assumptions of low self-control theory, it is entirely possible that offenders across the self-control spectrum, from low to high levels, are engaging in criminal behavior. Therefore, criminal justice interventions focused on modifying offender self-control levels may be misdirecting their efforts altogether, when in fact an unknown observable or latent characteristics maybe driving both peer-associations (e.g. state-dependence model) and self-control (e.g. persistent heterogeneity model) at a macro-level. For example, intergenerational cycles of poverty may effect an individuals physical health, social-network, and levels of self-control.

Arneklev et al. (1998) also conducted a test of Gottfredson and Hirschi's (1990) stability hypothesis using a convenience sample of college students providing self-report data collected in two waves that were separated by four months. Arneklev et al. (1998) suggests that college students are an ideal population for testing the stability hypothesis of self-control given their non-offending patterns of behavior which can be equated to higher levels of self-control and higher levels of writing and literacy skills for filling out self-report questionnaire. It is assumed through self-control theory that offending populations in comparison to non-offending populations have relatively lower levels of self-control and are, therefore, more likely to provide less valid and reliable responses on self-report questionnaires. Arneklev et al. (1998) quote Gottfredson and Hirschi's (1990) discussion on collecting data from offending populations which states "the higher the level of criminality, the lower the validity of crime measures (Gottfredon and Hirschi, 1990, p. 249)." The findings from the study conducted by Arneklev et

al. (1998) provide overall support for the persistent heterogeneity perspective and stability thesis being argued in self-control theory (Gottfredson and Hirschi, 1990).

Turner and Piquero (2002) tested the stability hypothesis of Gottfredson and Hirschi's (1990) low self-control theory. Turner and Piquero (2002) state that the stability assumption of Gottfredson and Hirschi (1990) is built on two empirical observations including (1) the age effect on crime and (2) the consistent positive correlative findings related to measuring engagement in criminal activity at various stages in an individual's life. The stability hypothesis is built on the premise by Gottfredson and Hirschi (1990) that parental guardians who care and monitor their children's behaviors and thoughts, will be able to recognize when their child behaves in a deviant manner. The parents who consistently monitor their children are said to be performing "effective socialization" and will be able to correct their children's antisocial and deviant behaviors.

By performing effective socialization, Gottfredson and Hirschi (1990) predict that those child rearing practices will result in the child expressing higher levels of self-control throughout their lives and in various situations (Turner and Piquero, 2002). Therefore, according to Gottfredson and Hirschi (1990) the stability of low self-control is established in individuals that lack the four conditions: care, monitoring, recognition, and correction of negative behaviors by parental guardians.

Turner and Piquero (2002) clarify that the stability assumption does not mean that once self-control is established it remains "stable and fixed" and that the absolute levels of self-control within an individual are unable to be changed. Although, Gottfredson and Hirschi (1990) argue that individuals can alter their absolute levels of self-control, but ranking of self-control between individuals will remain stable and unchanged. For example, the distinction made by Gottfredson and Hirschi (1990) between offenders and non-offenders should persist across the life-course in

terms of who engages in crime, delinquency, and analogous crimes. Therefore, offending

patterns that distinguish between offenders and non-offenders at the age of 15 will continue to be

distinguished at the age of 25, 35, 45, and so on for both groups as a result of the relative

stability of self-control between groups. To clarify why there appears to be an age effect on

criminal behavior Turner and Piquero (2002) quote Gottfredson and Hirschi (1990, p. 107) by

stating:

> "Combining little or no movement from high self-control to low
> self-control with the fact that *socialization continues to occur*
> *throughout life* produces the conclusion that the proportion of the
> population in the potential offender pool should tend to decline as
> cohorts age."

The quote intends to counter the notion that age alone effects the crime rate. Instead,

Gottfredson and Hirschi (1990) acknowledge that individuals continue to experience practices of

socialization throughout the life-course and that *within* individual changes in self-control levels

can occur. Therefore, individuals with low self-control can move in the direction of gaining

higher levels of self-control, but individuals with high self-control seldom move in the direction

of low self-control (Turner and Piquero, 2002).

Turner and Piquero (2002) found partial support for Gottfredson and Hirschi's (1990)

stability hypothesis by comparing offenders and non-offenders and demonstrating that relative

rankings between both groups persisted over time. When analyzing within individual differences

of offenders and non-offender Turner and Piquero (2002) found that individuals who scored in

the highest quartile of having low self-control before the age of eight continued to do so over the

life-course on behavioral and attitudinal measures of self-control. However, the results from the

within group analysis of offenders and non-offenders was not consistently significant indicating

mixed support for the stability hypothesis. These findings also demonstrated that behavioral and

altitudinal measures of self-control perform relatively similarly for detecting self-control traits

for both within and between group differences being measured over the life-course.

Low Self-Control as a Predictor of Substance Use, Offending Behavior, and Parole Failure

Table 2.01. Summary of Research on Self-Control as a Predictor of Substance Use, Offending Behavior, and Parole Failure

Peer-Reviewed Articles	Findings support the relationship between low self-control and substance use	Findings support the relationship between low self-control and offending behavior	Findings support the relationship between low self-control and parole failure	The findings do not strongly support low self-control
Baler, R. D., & Volkow, N. D. (2006).	Yes			
Beaver, K. M., DeLisi, M., Mears, D. P., & Stewart, E. (2009).		Yes	Yes	
Conner, B. T., Stein, J. A., & Longshore, D. (2009).	Yes	Yes		
Delisi, M., & Berg, M. T. (2006).	Yes	Yes	Yes	
Ersche, K. D., Turton, A. J., Pradhan, S., Bullmore, E. T., Robbins, T. W. (2010).	Yes			
Grasmick, H., Tittle, C., Bursik, R., and Arneklev, B. (1993)		Yes		
Langton, L. (2006).			Yes	
Longshore, D., & Turner, S. (1998).		Yes		
Ribeaud, D., & Eisner, M. (2006).	Yes	Yes		
Tittle, C. R., Ward, D.A., & Grasmick, H. G. (2003).		Yes		
Tittle, C. R., Ward, D.A., & Grasmick, H. G. (2003).	Yes	Yes		
Vazsonyi, A. T., Pickering, L. E., Junger, M., & Hessing, D. (2001).		Yes		
Vazsonyi, A. T., & Crosswhite, J. M. (2004).		Yes		
Winfree, L, T., Taylor, T. J., He, N., & Esbensen, F. (2006).				Yes
Wolfe, S. E., & Higgins, G. E. (2008).	Yes			

Ribeaud and Eisner (2006) discuss how the connection between substance use, crime, and

parole failure is an established empirical finding in the social science literature. To that end, the

researchers argue that any theory claiming to provide a general theoretical explanation for all

criminal behavior must account for the relationship between drug-use and crime. Table 2.01

provides a brief overview of the strong empirical support found in the extant literature on how

low self-control is a valid and reliable predictor of substance use, offending behaviors, and

parole failure. However, it should be noted that Wolfe and Higgins (2008) found that there was

weak empirical support between low self-control traits and excessive alcohol consumption when

examining the moderating influence of perceptions of control. Their findings suggest that peer associations are an equally strong predictor of excessive alcohol consumption when compared to low self-control theory.

Previous research by Arneklev et al. (1998) states that if an individual commits a crime such as stealing or performing armed robbery to obtain cash to purchase heroin, then this would fall under the domain of a state-dependent theoretical perspective. More specifically, the drug addiction is driving criminality and causing self-control to decrease at the individual level. However, other theoretical perspectives argue that an underlying third variable related to personality traits exists to explain both criminal behavior and drug addiction. Theoretical perspectives that attempt to explain stable between-individual differential propensities to engage in socially undesirable behaviors such as drug-abuse, alcohol-abuse, violent behaviors, fraudulent behaviors, poor job or school performance, and failed social relationships are explained through a 'persistent heterogeneity' perspective which seeks to explain these behaviors through latent personality traits (Ribeaud and Eisner, 2006).

Gottfredson and Hirschi's (1990) self-control theory is a member of the population heterogeneity perspective and seeks to explain crime and analogous behaviors as being a result of low self-control. Self-control theory explains both drugs use and criminal behavior as being the result of low self-control traits, because individuals with low self-control engage in activities that are "immediate, easy, and certain short-term pleasure" (Ribeaud and Eisner, 2006; Gottfredson and Hirschi, 1990, p. 41). Therefore, the low self-control perspective does not attribute a causal link to exist between drug or alcohol use resulting in criminal behavior. Instead, the low self-control perspective argues that individual level latent personality traits cause both drug use and criminal behavior (Ribeaud and Eisner, 2006).

Ribeaud and Eisner's (2006) research study is guided by two questions that attempt to understand whether the drug-crime link can be explained through the population heterogeneity perspective. More specifically, does level of self-control predict and explain the correlation between drug use and criminal behaviors? Although self-control reduced the correlation between drug use and crime, it does not entirely account for the correlation between the two variables. The reduction in the correlation between drug use and crime was not as substantial as Gottfredon and Hirschi's (1990) theory would have claimed. Therefore, alternative theoretical explanations are needed to explain the relationship between drug use and crime.

However, Ribeaud and Eisner (2006) discuss the possibility that two additional unexplored sub-dimensions listed b Gottfredson and Hirschi (1990) may increase the predictive strength of the self-control construct. Gregariousness, Sociability, and indifference to pain and discomfort remain unexplored as sub-dimensions of self-control. Ribeaud and Eisner (2006) argue that individuals that have high levels of gregariousness and sociability may be driven to environments such as bars, nightclubs, gambling venues, and other areas where crime or analogous behaviors and substance use are occurring simultaneously. Ribeaud and Eisner (2006) specifically state: "Accordingly, gregariousness can be viewed as a personality trait that guides one's routine activities toward opportunities or risks of substance use and those types of delinquency that involve the presence of others" (p. 59).

Ribeaud and Eisner (2006) found that the sub-dimensions risk-seeking and impulsivity are equally as powerful predictors of crime and drug use as the overarching self-control construct that contained the five sub-dimensions excluding 'simple tasks'. Ribeaud and Eisner (2006) suggest that these two sub-dimensions are the actual core of the self-control construct and that

for the logic of model parsimony that the self-control construct can be reduced to the two sub-dimensions for predicting drug use and crime.

Conner et al. (2009) tested whether a global self-control measure or a multidimensional measure of low self-control is a better predictor of drug use among adolescent male offenders. A number of empirical studies have proven that low self-control traits account for a significant amount of the variance that exists when predicting criminal behaviors. In particular, research has also demonstrated that higher levels of self-control predict positive social interactions such as good adjustment, better school performance, and interpersonal development (Tangney et al., 2004).

Conner et al. (2009) discussed the link that was developed by Gottfredson and Hirschi (1990) between low self-control and drug use. Individuals with low self-control were found to pursue pleasures that provide immediate gratification such as drinking, sex, smoking, and drug use. Therefore, low self-control should be the primary factor for predicting drug use and other analogous behaviors. (Gottfredson and Hirschi, 1990; Conner et al., 2009). Conner et al. (2009) specifically hypothesized that the low self-control concept defined by Gottfredson and Hirschi (1990) and measured by Grasmick et al. (1993) low self-control scale should not significantly differ in its ability to predict drug use, regardless, of whether it is tested through a unidimensional measure of low self-control or as multiple sub-factors of low self-control when tested through confirmatory factor analysis.

However, Conner et al. (2009) found that the unidimensional latent construct of low self-control was unable to predict violent, property, and drug crimes. Results from Conner et al. (2009) research indicate that only two of the low self-control scale's subscales significantly predicted property, violent, and drug related crimes among criminal justice involved adolescents.

The subscales for volatile temper and risk seeking significantly predicted violent crime and drug use. The risk seeking sub-factor predicted property crime. Tittle et al. (2003) also states that the findings from their study are damaging to the over-optimistic claims made by self-control theory and that support for self-control is weakened as a result of its inability to provide a reliable and concrete method of measurement for the concept of self-control. Also varying measures of crime and deviance effect the statistical significance of self-control, thereby suggesting that self-control is not a strong measure of crime and requires theoretical refinement.

Parole and probation violators are the fastest growing populations with in the prison systems, particularly for drug offenses (Friedmann, 2008). As a result of the high rates of failure for completing mandates with in these populations, a substantial amount of research with in the fields of criminal justice and psychology is being devoted to modelling the problems through theoretical research. The dominating perspective at the moment is that the individuals who are at the highest risk for being unsuccessful and recidivating should have more attention and resources shifted towards them, particularly for rehabilitation interventions (Langton, 2006; Andrews and Bonta, 2010).

Langton (2006) examines parole failure through the perspective provided by Gottfredson and Hirschi's (1990) self-control theory in order to understand how the assumption that low self-control is trait stabilized and is a more powerful force when compared to the methods used by the criminal justice system when attempting to reduce crime (Langton, 2006, p. 469). Langton (2006) states that the extant literature has identified numerous factors that strongly correlate with recidivism. Static variables such as age of offender at time of sanctioning, race, expected grade placement, first time vs. non-first time offenders, crime classified as violent, and number of months incarcerated prior to being released back into the community have been empirically

proven to predict parole and probation failure. Langton's (2006) research study distinguishes between static and dynamic factors in the assessment of risk of parole failure and recidivism. Langton (2006) controlled for antisocial and criminogenic needs when conducting logistic regression analyses. Langton (2006) found that low self-control was significantly and positively related to parole outcome such that individuals in the in the lowest self-control category had the highest likelihood of parole failure than individuals in the highest self-control category. Age was the strongest predictor of recidivism for both juveniles and adults.

Langton (2006) examined the relationship between low self-control and parole failure while controlling for substance abuse, antisocial behavior, peers, and personal achievement variables. All of which were dynamic factors previously indicated as predictors of risk for recidivism. Again low self-control was a positive and significant predictor of parole failure. However, the strongest predictor of parole failure was number of criminal partners involved in the crime that led to admission (e.g. negative peer associations). However, contrary to the expectations of Akers's (1997) social learning theory, it was found that the more partners that were involved in a crime the more likely parolees were to succeed at completing parole compared to individuals who acted alone. Langton (2006) states that one possible explanation for this finding is that individuals who offended in groups were highly susceptible to peer influences, however, once they were institutionalized and separated from negative peer associations they were less likely to commit future crimes.

In another analysis, Langton (2006) controlled for static variables and found that low self-control moderately predicted parole failure. In this model, individuals who committed a violent offense had the strongest prediction of successfully completing parole when compared to individuals who did not have a violent offense. Although this finding seems counter-intuitive, it

is consistent with previous research findings that state that individuals who commit property crimes are correlated with a higher risk for recidivism (Langton, 2006). The findings in their model are not consistent with the argument posited by Gottfredson and Hirschi that offenders do not specialize and that offense type is irrelevant to predicting recidivism. Langton's (2006) study demonstrates a clear distinction between violent and non-violent offenders and their likelihood in succeeding in parole and recidivating. Also, Langton (2006) found that individuals with a first time offense were more likely to succeed at completing parole compared to individuals who were previously admitted in to the criminal justice system.

Langton's (2006) research study strongly suggests the need for theory to guide the development of risk assessments and to explain the mechanism by which recidivism and parole failure occurs. Programs for reducing recidivism should be focused on reducing the opportunities for crime instead of focusing on reducing the offending potential of individuals that have been identified as being at high-risk for reoffending. A policy of increased surveillance and supervision may be the most effective strategy for reducing recidivism rates (Langton, 2006).

Low Self-Control as a Predictor of Analogous Behaviors

Gottfredson and Hirschi (1990) theorize that individuals with low self-control traits will with a high probability engage in analogous behaviors, such as, poor work-ethics, accidents, cigarette smoking, intoxication by alcohol, and "illicit sex" (p. 90). The theorists state that analogous behaviors are defined as non-criminal behaviors that form as a result of poor parental socialization practices and that analogous behaviors are frequently occurring, socially inappropriate, and may cause self-harm or harm to others. Of the wide range of analogous behaviors that are identified by Gottfredson and Hirschi (1990), "illicit sex" or what HIV

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researchers would describe as risky sexual practices have probably the most immediate and devastating consequences for individuals, families, and the larger community.

However, contrary to the theoretical claims made by Gottfredson and Hirschi (1990) previous research demonstrates that personality characteristics (e.g. low self-control) alone cannot explain the incidence and prevalence of sexual behavior and sexually transmitted diseases (STDs), which has been found to be related to a number of contextual factors that includes substance use, housing instability, poverty, stigma, dissolution of family and primary sex partner relationships, lack of medical access, education/employment, and social disorganization within neighborhoods (Green et al., 2011; Green et al., 2012). Also there exists little or no previous research examining the empirical relationship between low self-control and post-treatment outcomes related to risky sexual practices among parolees participating in substance use treatment. This dissertation adds to the literature on sexual behaviors among parolees by closely examining a number of variables related to risky sexual practices and their relationship to self-control.

Green et al. (2011) states that 14% of people who are HIV positive in the U.S. pass through the criminal justice system and that the prevalence of HIV in prison is in the range of 0.2-7.5%. The average rate of HIV positive diagnosis across prisons is 1.9%. Green et al. (2011) reports that this rate is higher than any other institution in the U.S. The fact that one in every 100 adults is currently incarcerated in the U.S. alongside high rates of HIV positive individuals has forced researchers to raise red flags for policy makers indicating that the relative risk for acquiring an STD or HIV while incarcerated may artificially produce the necessary conditions for an epidemic as the formerly incarcerated cycle between their communities, parole, jail, or prison.

Although, the institution of parole is primarily for monitoring offenders serving the remainder of their sentences in the community, researchers have stated that utilizing existing correctional infrastructure for public health purposes may present a unique opportunity to educate, monitor, and disrupt the spread of infectious diseases for individuals at-risk or diagnosed with HIV and STDs (Green et al., 2011). The reentry period following incarceration has been described as a period that is "uniquely hazardous" due to the increased probability of relapsing and engaging in behaviors that increase risk for HIV transmission, especially if parolees are lacking access to basic amenities such as substance abuse treatment, housing, financial stability, and physical and/or mental health care (Green et al., 2011).

Green et al. (2011) used data from the Step'n Out study to examine the relationship between parole officers and parolee HIV behaviors. The researchers state that there are two primary reasons to believe that the parole officers' relationship with parolees in the Step'n Out study may impact outcomes on HIV risk behaviors among parolees. First, close monitoring and supervision by parole officers, through the use of structured rewards and punishments, found in the Step'n Out study, may act as a deterrent for parolees considering utilizing drugs, particularly, intravenous injections and needle sharing, which can consequently reduce HIV transmission. Secondly, building strong working alliances, developing goals, and utilizing strategies by both parole officers and parolees has been found to increase perceptions of fairness and may result in better substance use outcomes that facilitate the reductions in at-risk sexual behaviors (Green et al., 2011).

The results of the study conducted by Green et al. (2011) indicate that a positive and supportive parole officer relationship with parolees, built on a working alliance reduces sexually risky behaviors among women, but not males in the Step'n Out study (Bordin, 1979). Bordin

(1979) found that three aspects facilitate collaboration and strong working alliances between treatment providers and those receiving the treatment: "(1) mutual agreements and understandings regarding the goals sought in the change process; (2) the tasks of each the partners; and (3) the bonds between the partners necessary to sustain the enterprise." Green et al. (2011) hypothesize that a strong working alliance and trust between parole officers and female parolees may facilitate self-efficacy for developing and maintaining protective factors against HIV risk behaviors. A strong working alliance between parole officers and parolees allows for the encouragement of developing protective factors which may include using contraceptives during intercourse, selection of less risky partners, developing monogamous relationships, securing financially stability, and disengaging from sex-work (Green et al., 2011).

Also, it is possible that the parole officers in the Step'n Out study acted as 'boundary spanners' for the females, by providing a multifaceted array of acute services that included navigating the referrals and admission process to mental and physical health services, substance abuse treatment services, supportive-housing programs, and by providing supportive counseling (Steadman, 1992). Green et al. (2011) demonstrates that gender moderates the relationship between parole officer/parolee relationships and post-treatment HIV risk behavior outcomes. However, the researchers did not control for theoretically specified individual-level personality characteristics (e.g. low self-control) which may increase the propensity for engaging in risky sexual practices, regardless of contextual protective factors, such as, a strong working alliance.

The Relationship between Low Self-Control and Procedural Justice

If parolees with histories of crime and drug-use that are participating in an intervention can be further sub-stratified according to their levels of self-control, then it is also important for researchers to understand how individuals with lower levels of self-control traits perceive the

fairness or the legitimacy of the intervention that they are receiving compared to individuals with higher levels of self-control. Reisig et al. (2011) reports that prior research has found that an individual's legal orientations (or domains of socialization) is directly related to behavioral outcomes such as law-abiding behavior or criminal offending. Legal orientations, such as legitimacy and legal cynicism, are shaped early in life through direct formative experiences with the criminal justice system or vicariously through observations of what others have experienced when encountering the criminal justice system (Reisig et al., 2011).

Core aspects of self-control are shaped early in life and remain static after the formative years (Gottfredson and Hirschi, 1990). Gottfredson and Hirschi (1990) would argue that even legal orientations, such as perceptions of fairness, legitimacy, or cynicism of the criminal justice system would be strongly linked with the development of self-control and its constituent sub-factors which are theorized to become stabilized around the age of 8 (Gottfredson and Hirschi, 1990; Reisig et al., 2011). More specifically, Gottfredson and Hirschi (1990) would argue that individuals with low self-control would be more likely to perceive the criminal justice system as unfair, because they would naturally view authorities with suspicion and contempt compared to individuals with higher-levels of self-control. Reisig et al. (2011) discusses Tyler's 2006, Chicago Study, which found that individuals with increased perceptions of legitimacy and low levels of cynical perceptions of the law and legal system are positively correlated with adherence to the law and criminal justice system.

The process-based model of procedural justice is psychological because it focuses on the subjective judgments of the public and their perceptions of police and court procedures as an indicator of the effectiveness of legal authorities. Tyler (2003) states that the process-based model is "concerned with the social science question of why people do or do not comply with

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legal authorities" (p. 285). This question is important because from an organizational

perspective, the ability for authorities to gain compliance is related to efficient and effective

management of groups or organizations within a society. Therefore, procedural justice is based

on the "state dependence" model which would allow researchers to infer that rates of compliance

with the legal authorities can be manipulated through evidence based practices and policies.

However, the psychological process-based model is not concerned with normative

questions such as whether people or the public "ought to" obey the law and legal authorities.

Issues such as the moral and ethical questions related to obedience to authority are the concern of

philosophers and ethicists according to Tyler (2003). Also, it has been theorized by social

scientists that hierarchy and power may produce structural inequality. This is a widely discussed

and debated topic among social theorists who argue that hierarchical structures produce racial

and gender discrimination, alienation of minorities, and socio-economic disparities. Social

theorists have traditionally argued that such structures should be rejected and that the legal

authorities enforcing such structures should be defied and disobeyed (Tyler, 2003). Tyler (2003)

states that if the social structure is viewed as fundamentally unfair by a particular group of

people, then individuals who do comply with such authorities may be regarded as being in a state

of "false consciousness" and that willingness to comply with the law should be discouraged.

However, Tyler (2003) states that the process-based model of policing does not attempt to

address these issues. Instead the process-based model is primarily focused on how the evaluative

judgments of the public effect the functioning of social regulatory mechanisms such as the police

and courts.

The process-based model's primary argument is that the police can and often do gain the

compliance of the public through coercion and threatening to use force, however, threatening to

use force is not the only mechanism by which the police can gain immediate and long-term

public compliance with the law and authorities. Tyler (2003) argues that cooperation and consent

through encouraging public "buy-in" is an alternative and more effective method for the police to

establish their authority, to build public support, and to gain immediate and long-term

compliance from the public. Tyler (2003) argues that the public is more likely to obey the law

and accept police authority if they "buy-in" to the legal system rather than if the legal system

resorts to force and coercion to achieve its crime control goals. Similarly, Bordin (1979)

discusses how complex relationships emerge between individuals in a position of authority

supervising individuals who are meant to obey that authority. These relationships can be better

facilitated through developing strong working alliances that focus on maintaining mutual

agreements, outlining clear tasks and goals, and building "rhythmic bonds" through shared

experiences and obstacles.

Tyler (2003) argues that procedural justice judgments made by the public are the central

judgments guiding the public's perceptions of legal authorities. Procedural justice judgments are

based on two procedural elements that are related to perceptions of fairness. The first procedural

element is the public's perception of the quality of decision making being made by the police and

the second element is the public's perception of the quality of interpersonal treatment being

relayed by the police to the public. Tyler (2003) argues that the police and legal authorities can

facilitate their own acceptance from the public through the use of feedback from the public

which will allow the police to engage in strategies that improve their process-based regulation of

the public.

When the public obeys the laws, orders, and directives from authorities such as judges

and police officers, it is because the public feels that the legal authorities deserve to be deferred

to which is related to perceptions of legitimacy and fairness. Tyler (2003) argues that when the

public feels that the legal authorities are procedurally just and deserve to be deferred to, then the

public also feels that these authorities have legitimacy and are entitled to their authoritative

position. Tyler (2003) states that the public is very sensitive to the methods by which the

authorities exercise their power and those perceptions of legitimacy are achieved when the public

feels that the authorities act fairly.

Reisig et al. (2011) reports that prior research has found that an individual's legal

orientations (or domains of socialization) is directly related to behavioral outcomes such as law-

abiding behavior or criminal offending. Legal orientations, such as legitimacy and legal

cynicism, are shaped early in life through direct formative experiences with the criminal justice

system or vicariously through observations of what others have experienced when encountering

the criminal justice system (Reisig et al., 2011). Similarly, core aspects of self-control are

theorized to be shaped early in life and remain static after the formative years (Gottfredson and

Hirschi, 1990). Gottfredson and Hirschi (1990) would argue that even legal orientations, such as

perceptions of fairness, legitimacy, or cynicism of the criminal justice system would be strongly

linked with the development of self-control and its constituent sub-factors (Gottfredson and

Hirschi, 1990; Reisig et al., 2011).

Self-control is the ability to regulate one's own behavior and is directly linked with

patterns of criminal offending (Gottfredson and Hirschi, 1990; Piquero et al., 2004; Reisig et al.,

2011). Piquero et al. (2004) found that individuals with low self-control have a higher probability

of judging criminal justice sanctions and punishments as unfair and unjust. Individuals with low

self-control are more likely to believe that they are being targeted for punishment compared to

individuals with higher levels of self-control. Therefore, understanding the relationship between

self-control traits and procedural justice is critical to developing effective punishments that deter future criminal behavior and rehabilitation interventions that seek to treat and modify criminal propensity. Also, conclusively determining whether self-control is a static or dynamic factor has major implications for the effectiveness of criminal justice sanctions such as parole or probation. If self-control is dynamic and can be influenced by criminal justice sanctions and rehabilitation interventions, then arguably the offender's perceptions of legitimacy of the criminal justice system can also be altered in a direction that simultaneously increases positive evaluations of criminal justice sanctions and reduces the offender's risk for recidivism and disobeying the law.

Drawing upon Reisig et al. (2011) discussion of Tyler's 2006 work would allow us to hypothesize that an intervention that can increase an individual's level of self-control and perceptions of legitimacy of the criminal justice should also be able to reduce an offender's recidivism. Reisig et al. (2011) developed a confounding hypothesis that states that individuals with lower levels of self-control will have greater cynicism towards the law and will have greater suspicion of the legitimacy of legal authorities. The hypothesis developed by Reisig et al. (2011) is built on two conditions. The first condition is that variations in low self-control account for variations in self-reported criminal offending. The second condition is that low self-control is related to attitudes and perceptions of the law, legal system, and legal authorities. Prior research has confirmed both conditions. However, previous research has not tested a confounding hypothesis that tests the mediating relationship that low self-control has on legal orientation predicting self-reported criminal offending. Reisig et al. (2011) states that the confounding hypothesis would be confirmed if the effects of legal cynicism and legitimacy on criminal offending are no longer statistically significant once the low self-control variable is entered into the equation.

The research study conducted by Reisig et al. (2011) is consistent with arguments that state that multiple factors related to socialization influence the extent to which individuals throughout the life course develop law-abiding or law-violating behaviors. However, this study does not conform to Gottfredson and Hirschi's (1990) general theory of crime which argues that self-control fully explains all crime and criminal behavior because it does not take into account how legal orientations independently effect criminal behaviors. Although, low self-control remains a strong predictor of criminal behavior, it did not fully account for the unexplained variation in criminal offending among the independent variables in the study conducted by Reisig et al. (2011).

Reisig et al. (2011) states that the concept of legal orientations, particularly, legitimacy has important policy implications. Although research has revealed that implementing punitive deterrent penalties for criminal behavior and removing criminal opportunities has had mixed results, regardless it has long been believed that legal authorities have little influence on overall crime patterns. Wilson (1975) argues that addressing crime-causing factors, particularly factors related to macro-level socio-economic structures (e.g. poverty) and family disruption (e.g. rates of single parents) is beyond the reach of the criminal justice system (Reisig et al., 2011). However, the present study demonstrates that there is an inverse relationship between perceptions of police legitimacy and criminal activity when controlling for individual-level variations in self-control (Reisig et al., 2011). Reisig et al. (2011) recommends that criminal justice institutions should improve and modify training curriculums for their staff so that they strongly emphasize the development of practices that improve perceptions of legitimacy and reduce legal cynicism among the communities of the individuals that they serve.

Wolfe's (2011) study tests the interaction between low self-control and procedural justice judgments and its influence on perceptions of police legitimacy. Wolfe (2011) argues that understanding the sources of police legitimacy will allow police and politicians to shape policies that are grounded in the process-based model of policing. Wolfe (2011) hypothesizes that sources of perceptions of police legitimacy may be influenced by individual levels of self-control in addition to or beyond the explanatory power of normative procedural justice judgments. However, Tyler (2003) argues that procedural justice judgments alone explain perceived legitimacy, because procedural justice judgments are rooted in normative standards that are not effected by individual differences in personality characteristics (Wolfe, 2011).

Wolfe's (2011) first hypothesis was that self-control primarily predicted perceptions of police legitimacy. Wolfe's (2011) second hypothesis is that any observed relationship between self-control and legitimacy will be mediated by procedural justice. Wolfe's (2011) third hypothesis is that procedural justice judgments on police legitimacy are influenced by an individual's level of self-control. Wolfe (2011) states that if there is empirical evidence to support the third hypothesis it has major implications for policy, particularly that individuals with low self-control who are theorized to be the most frequently in contact with the police are not impacted by fair procedural justice practices from police.

Wolfe (2011) discusses how previous research conducted by Fagan and Tyler in 1996, demonstrated that procedural justice had more of an important impact on legitimacy than measurements of impulsivity, but that study did not look at other traits associated with self-control theory such as self-centeredness. Wolfe (2011) discusses how Tyler's (2003) theory assumes that normative procedural justice judgments trump individual self-interest and would hypothesize that the self-centeredness trait from self-control theory does not influence

perceptions of police legitimacy. However, research prior to Wolfe's (2001) study had not tested the relationship between self-centeredness and police legitimacy and, therefore, it remains to be observed whether procedural justice judgments or self-control is a greater predictor of police legitimacy. Wolfe (2001), states that this is an important theoretical question, because if it is found that normal procedural justice judgments alone determine police legitimacy, then Wolfe (2011) argues that "police can garner perceptions of legitimacy even from people with low levels of self-control. This is especially relevant given that a majority of the people that police deal with have low self-control" (Wolfe, 2011, p. 69).

Results from the study conducted by Wolfe (2011) indicate that individuals that scored higher on having lower levels of self-control were positively correlated with both procedural justice judgments and perceptions of police legitimacy. Therefore, individuals with lower levels of self-control were less likely to have positive judgments of procedural justice and were less likely to perceive the police as legitimate. Procedural justice and police legitimacy were also found to be highly correlated. Meaning that individuals who were more likely to judge the police as being procedurally just were also more likely to view the police as a legitimate authority. Wolfe (2011) found that scoring high on measures of low self-control inversely predicted lower levels of procedural justice judgments. The analysis indicates that individuals with low levels of self-control are unlikely to rate police as procedurally fair. This finding is important because it demonstrates that self-control accounts for significant variation in the mediation variable, procedural justice judgments.

The research study conducted by Wolfe (2011) has concrete implications because the data suggests that individuals with low self-control are able to have their normative evaluations of procedural justice shaped by interactions with the police rather than judgments being

determined by stable personality characteristics. This finding requires additional testing to confirm the construct validity and reliability of the scales being used to measure self-control, procedural justice, and police legitimacy.

Wolfe (2011) recommends that police training include future oriented methods for process-based policing models that focus on dealing with individuals with low self-control traits, particularly those individuals who are exhibiting impulsivity or self-centeredness. Although, this study demonstrates procedural justice judgments are a strong and significant predictor of perceptions of legitimacy, individuals with low self-control traits may have their perceptions of legitimacy determined by stabile personality characteristics rather than primarily by normative standards of evaluating interactions with the police. Therefore, police may have to communicate and interact with individuals with low self-control differently than the general population in order to gain their compliance. However, further research is needed to develop and understand methods for communicating and interacting with individuals with low self-control traits in order for police to facilitate perceptions of legitimacy and fairness.

Low Self-Control and Rehabilitation

The findings of Latessa (2008) demonstrate that targeted interventions guided by theory and empirical findings can produce reductions in recidivism for high-risk offenders (Andrews and Bonta, 2010). However, it remains unclear how offenders with traits characterized as low self-control perform when receiving interventions targeting offender drug use that are being guided by learning theory and procedural justice theory, such as, during the Step'n Out study's Collaborative Behavioral Management intervention (Gottfredson and Hirschi, 1990; Friedmann et al., 2011). Contributing empirical evidence to the debate over whether self-control traits are static or dynamic when receiving a theoretically oriented intervention, such as the Collaborative

Behavioral Management treatment, will allow researchers to build stronger screening instruments and treatment programs that specifically target offenders who will benefit the most from these programs through responsive interventions.

What is known about self-control is that the extant literature has repeatedly confirmed that offending populations score lower on measures of self-control relative to non-offending populations (Langton, 2006). This finding is predicted by Gottfredson and Hirschi (1990) because their theory specifically argues that individuals entrenched in the criminal justice system have lower self-control compared to law-abiding individuals. However, the research conducted by Langton (2006) also demonstrates that an offending population had self-control scores that fell within a normal distribution. Langton's (2006) findings confirmed claims by Hirschi and Gottfredson (2000) that even within offending populations there will be variations in self-control.

According to self-control theory correctional interventions and treatments regardless of their theoretical orientation are ineffective at producing long-term pro-social changes in individuals characterized as having low self-control traits (Gottfredson and Hirschi, 1990; Grasmick et al., 1993; Evans et al, 1997). Self-control theory's assumption of trait stabilization has had profound implications for criminals and the criminal justice system by focusing rehabilitation policy efforts on early childhood development, when the socialization stage of development is malleable to change through early intervention programs focused on shaping self-control for children and adolescents (Piquero et al., 2010).

Hirschi and Gottfredson (2001) state that for adults with low self-control, law-enforcement and corrections agencies cannot deter their criminal propensity because "large increases in the number of such agents would have minimal effects on the rates of most crimes

(p. 93)." Also, Piquero et al. (2010) discussed how increases in legal penalties do not deter offenders with low self-control, because those offenders do not rationally weight the costs and benefits of engaging in criminal activity. Gottfredson and Hirschi (1990) specifically state:

> "Our theory would be consistent with efforts to teach the offender self-control, but all indications are that such teaching is highly unlikely to be effective unless it comes very early in development. Given the ineffectiveness of natural learning environments in teaching self-control, we would not expect the artificial environments available to the criminal justice system to have much impact" (p. 269).

The notion that some individuals are simply incorrigible and will not respond to empirically driven rehabilitation programs has wide-ranging policy and ethical implications that could result in arguments being made in favor of a return to indeterminate sentencing, long-term intensive supervision, or incapacitation for adult offenders characterized as having low self-control traits. According to self-control theory individuals with low self-control traits cannot be deterred or rehabilitated from engaging in criminal activities and, therefore, require Orwellian-esque style interventions to maintain the security of society and to manage the offenders' risk for recidivism (Gottfredson and Hirschi, 1990).

However, confirmation of the theoretical assumptions posited by Gottfredson and Hirschi (1990) that offenders with static self-control traits will not respond to interventions aimed at reducing criminal behaviors based on integrating learning and procedural justice theories (e.g. Step'n Out study) requires empirical evidence that has thus far not been concretely reported in the existing literature on reentry and drug-treatment research. This specific research study aims to understand whether the Step'n Out study's Collaborative Behavioral Management intervention developed by Friedmann et al. (2009) has the capacity to alter substance use, recidivism, and analogous behaviors of parolees characterized as having low self-control. It is imperative that

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researchers include tests of self-control theory in their research on correctional interventions and treatments in order to clarify whether self-control traits are static or dynamic when interacting with rehabilitation program models.

Statement of the Problem

Gottfredson and Hirschi's (1990) self-control theory is one of the most widely tested theories in the field of criminology and has wide ranging policy implications for the criminal justice system, particularly in terms of the development of risk-assessments, punishment policies, and treatment models for individuals identified as having low self-control traits. The theory supports a number of assumptions about how self-control provides a general explanation of individual level criminal behaviors, how it is developed through parental socialization practices, the age at which it stabilizes with in individuals, and its inability to be effectively modified by criminal justice interventions (Gottfredson and Hirschi, 1990).

The primary assumption being put forth by Gottfredson and Hirschi (1990) is that low self-control traits are stabilized after early childhood and that it is increasingly difficult to reverse low self-control traits as an individual matures into adolescence and then into adulthood. Therefore, self-control theory would arguably support criminal justice policies that incapacitate criminals (e.g. three-strike laws) and remove offending opportunities for criminals (e.g. target hardening or stop-and-frisk policing). Reisig et al. (2011) has demonstrated that there is a direct correlational relationship between self-control traits and perceptions of legitimacy and legal cynicism of the criminal justice system. Specifically, those individuals with low self-control traits are strongly correlated to perceive the criminal justice system with cynicism (Reisig et al., 2011).

However, Andrews (1995) research into the psychology of criminal conduct (PCC) contradicts the trait stabilization thesis put forward by Gottfredson and Hirschi (1990) and contemporary research conducted by Lipsey and Cullen (2007) has proceeded to demonstrate that rehabilitation and reentry interventions built on evidence based practices have the capacity to predict and detect criminal behavior through risk-assessments (e.g. LS-CMI, LSI-R, and LSI-R:SV) and the ability to deliver effective treatments based on offender risk profiles (risk principle and criminogenic needs) that can yield large reductions in recidivism for high-risk offenders compared to the traditional criminal justice interventions that are widely available such as through punitive approaches (e.g. supervision and sanctions) or through educational and vocational programs (Andrews et al., 2006; Lipsey and Cullen, 2007; Latessa, 2008). Therefore, it is important to evaluate through a theoretical framework (e.g. self-control theory) whether pre-existing criminal justice infrastructure (e.g. parole) combined with an experimental treatment intervention (e.g. Step'n Out study) designed to increase communication and collaboration between law-enforcement, treatment practitioners, and parolees can reduce offenders' post-treatment outcomes related to substance use, recidivism, and analogous behaviors.

This dissertation will be testing Gottfredson and Hirschi's (1990) low self-control theory by conducting a secondary data analysis of the Criminal Justice Drug Abuse Treatment Studies (CJ-DATS): Step'n Out study (Friedmann et al., 2002-2006). The Step'n Out experiment was a six-site randomized controlled trial with intent-to-treat that was conducted to determine whether parolees in the treatment group would have improved outcomes compared to parolees receiving standardized parole. The Step n' Out study experiment tested the Collaborative Behavioral Management (CBM) intervention which was a 12-week intervention conducted on parolees that was designed to improve outcomes such as utilization of substance abuse treatment, reduce drug

use, increase parole sessions, and to facilitate the integration of parole and addiction treatment (Friedmann et al., 2009).

Based on the theoretical framework provided by Gottfredson and Hirschi (1990) this study hypothesizes that individuals with low self-control traits are predicted to self-report substance use, recidivism, and analogous behaviors at the 3 and 9 month follow-up periods. This study hypothesizes that individuals with low self-control traits will not benefit from the Collaborative Behavioral Management (CBM) intervention due to the assumption of trait stabilization described in self-control theory and that individuals with low self-control are not amenable to criminal justice interventions. This study will also test the hypothesis that individuals with low self-control traits are predicted to have increased perceptions of legal cynicism toward parole officers and/or treatment counselors by analyzing self-reported evaluations of parole officers and/or treatment counselors collected at the 3 month follow-up period from parolees.

However, if findings from this study demonstrate that parolees with low self-control had their post-treatment substance use, recidivism, analogous behaviors, and perceptions of fairness moderated by the CBM intervention, then the theoretical and policy implications for low self-control are profound and will be further analyzed in the final discussion in chapter seven. Therefore, it is imperative that research on criminal justice interventions understand post-treatment outcomes not only by comparing the treatment group versus the control group, but through a theoretically specified framework such as Gottfredson and Hirschi's (1990) low self-control theory to explain the mechanism by which personality, cognitive, and behavioral traits effect post-treatment outcomes and whether these traits are amenable to change through the rehabilitation framework.

Chapter 3

Self-Control and Post-Treatment Outcomes for Offenders Involved in the Step'n Out Study

Introduction to the Step'n Out Study

This chapter will begin by providing a brief synopsis of the National Institute on Drug Abuse (NIDA) sponsored Criminal Justice Drug Abuse Treatment Studies (CJ-DATS) – Step'n Out study, the first national multi-site randomized controlled trial of the Collaborative Behavioral Management (CBM) intervention (Friedmann et al., 2008). The Step'n Out study was conducted in response to the growing need for "enhancing treatment engagement" between parolees with histories of substance use, parole officers, and substance abuse counselors through the use of the Collaborative Behavioral Management (CBM) intervention (Friedmann et al., 2009).

The CBM intervention was designed to increase treatment engagement, reduce post-treatment substance use, and reduce post-treatment recidivism. The study was primarily managed at the Rhode Island Research Center, Substance Abuse Research Unit, Rhode Island Hospital, at Brown University. The principle investigator of the Step'n Out study was Dr. Peter D. Friedmann. The Step'n Out study experiment was conducted from 2005 to 2008 and is a six-site randomized clinical trial that randomly assigned parolees to either the Collaborative Behavioral Management (CBM) intervention group (n = 243) or the control group (n = 233) (Friedmann et al., 2009; CONSORT Diagram, Figure 3.01 in appendix). The analysis of the Step'n Out study utilized a modified intent-to-treat approach. If participants were successfully screened, randomized, and attended at least one single session with the parole officer, then their data was analyzed (Friedmann et al., 2012). The CBM intervention was 3-months long and involved

weekly sessions between parole officers, drug-treatment counselors, and the parolee. The parolee was also mandated to participate in out-patient substance use treatment.

The Step'n Out study utilized a variety of standardized instruments into its screening and assessment protocols, which made it possible for the present dissertation study to assess parolees participating in the study on the relationship between their levels of self-control and post-treatment outcomes related to substance use, recidivism, sexual practices, and perceptions of fairness. Demographic data related to age, race, education/ employment status, housing status, health problems, and family/peer relationships were also collected (Friedmann et al., 2008). Screening, intake, and follow-up interview data were collected by research assistants and parole officers. Both the treatment and control groups received identical interviews. Parolees participating in the Step'n Out study received $20, $40, and $60 in grocery store certificates for completing personal interviews completed at baseline (pre-randomization), 3-month, and 9-month follow-up periods after the initial parole session.

The screening data collection instruments for the Step'n Out study included the Texas Christian University (TCU) Drug Screen II, the Lifestyle Criminality Screening Form (LSCF), and the Structured Clinical Interview for DSM-IV TR (SCID-I/P). The TCU Drug Screen II was used to determine a prospective research participant's drug use and dependency history using the criteria established by the DSM-IV and the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (Friedmann, 2005). The LCSF measures risk of recidivism through four scales that include: Irresponsibility, Self-Indulgence, Interpersonal Intrusiveness, and Social Rule Breaking. The LCSF was used to identify prospective research participants with a moderate to high-risk (score 7 or higher) that will be randomized into the treatment or control group (Friedmann, 2005). The SCID-I/P is a semi-structure diagnostic interview that allows

researchers to screen prospective research participants for DSM-IV psychiatric diagnoses. Individuals with psychiatric diagnoses were ineligible to participate in the Step'n Out study (Friedmann, 2005).

The Theoretical Foundations of the Collaborative Behavioral Management Intervention

The Step'n Out study had three primary objectives. Friedmann et al. (2005) states that the first objective of the study was to systematize collaborative assessment and treatment orientation between parolees, parole officers, and treatment counselors. The second objective was to encourage strong therapeutic relationships and lasting behavioral change through rewarding pro-social behavior exhibited by parolees. Finally, the study sought to examine the relationship between the CBM intervention and how the quality of a working alliance between parole officers and substance use counselors effects parolees' perceptions of fairness (Friedmann et al., 2005).

The purpose of the study was to assess whether five main aims could be achieved in a three month long experimental intervention. The first aim was to determine whether the CBM intervention would allow parolees to negotiate realistic goals and objectives during their treatment period. Friedmann et al. (2005) hypothesized that early success and investment in the intervention by the parolees would result in positive life changes and successful completion of the treatment and supervision.

The second aim of the study was gain control over clients' behavior through "consistent, quick, and appropriate" consequences, either through incremental rewards or graduated sanctions. The researchers hypothesized that the parolees in the CBM intervention would respond better to treatment that is responsive to the parolees' behaviors. The researchers sought to shape the parolees behaviors by rewarding pro-social behaviors and parolees would be

punished for unwanted or illegal behaviors. The researchers assume that parolees with histories

of drug addiction maintain the ability to exercise rational decision making and will be

sufficiently deterred by graduated sanctions that are applied proportionally to unwanted or illegal

behaviors.

The third aim of the study was to increase attention to positive behaviors or to "catch

people doing things right." The researchers hypothesize that working alliances and perceptions

of fairness can be developed by rewarding parolees who display good behavior, which is then

assumed will be repeated if rewards are consistently and proportionally applied. The researchers

also assume that the working relationship between the parolee, parole officer, and substance use

counselor is strongly correlated with post-treatment outcomes. Therefore, parolees who have

been consistently rewarded for good behavior will not only have a strong working alliance with

their treatment counselor and parole officer, but will also be successful at completing treatment

and will have a decreased risk for engaging in substance use post-treatment (Friedmann et al.,

2005).

The fourth aim of the study was to instill a sense of fairness in parolees by demonstrating

to them that a relationship with a parole officer or substance use counselor does not have to be

adversarial and based on asymmetrical power structures. The study sought to "level the playing

field" between parolees and parole officers through fostering a collaborative relationship that

emphasized clearly defined expectations, transparency, and a standardized delivery of positive or

negative reinforcement (Friedmann et al., 2005).

The fifth and final aim of the study was to sustain behavior change beyond the period of

reinforcement. The researchers hypothesized that the CBM intervention had the capacity to

sustain behavioral changes developed during the treatment period which would extend into the

everyday life of the parolee once the treatment period terminated. The researchers recognize that once the artificial positive reinforcements provided by the criminal justice system are no longer available, it is possible that the parolees may return to the immediate and positive consequences provided by illegal substance use. Therefore, the study ultimately aims to help parolees recognize that maintaining pro-social, non-drug related or criminal activities after treatment has ended can be intrinsically rewarding in itself.

The control group received standard parole and had the option to attend voluntary drug treatment. The CBM intervention is derived from the principles of operant conditioning and procedural justice theory. Research conducted by Taxman et al. (2003) found that using positive reinforcement techniques for individuals involved in a supervision-based program provided motivation and feedback on achieving specified goals for the individuals receiving reinforcement. Operant conditioning is designed to shape behaviors through reinforcement and punishment guided by parole officers collaborating with drug-treatment counselors. Pro-social behaviors are reinforced with rewards so that the anticipated behaviors will be repeated. Unwanted behaviors are negatively reinforced or punished so that the unwanted behaviors are not repeated and extinguished (Friedmann, 2008, p. 292). Parolees in the Step'n Out study that were non-compliant with the intervention protocols received graduated sanctions related to the severity and frequency of the non-compliant behaviors being exhibited. Consequences for non-compliance ranged from verbal warnings to arresting and incarcerating individuals for violating the terms of their parole (Friedmann, 2008).

The procedural justice aspect of the CBM intervention posits that when individuals perceive laws, rules, and agents of law enforcement, such as parole officers, as fair and equal in treatment, then individuals are more likely to comply with the law and agents of law enforcement

(Tyler, 2003; Friedmann et al., 2008). Friedmann et al. (2008) states that a fair system clearly articulates rules and behavioral expectations and that rewards and punishments are consistently and equally applied in a predictable manner for all parolees (p. 293). The procedural justice aspect of the CBM intervention is achieved through role induction. Role induction is an evidence-based cognitive intervention for clients in drug-treatment, which helps the staff to clarify their expectations of the client and vice-versa. Role induction provides a framework for the client so that they are aware of the consequences of their actions and cannot easily dismiss the parole officer's punishments as being "unfair or unreasonable".

Friedmann et al. (2008) hypothesized that a predictable framework of expectations, rewards, and punishments will enhance the offenders' perception of fairness, thus, resulting in compliance and improved post-treatment outcomes. Abstaining from drugs, regularly attending treatment, and obeying the law are reinforced and are hypothesized to also improve the effectiveness of parole or probation in rehabilitating offenders. The social and material rewards that were provided to parolees adhering to the treatment intervention included but were not limited to resume/coverletter writing assistance, permission for out of state travel, organized outings, recognition awards, gift certificates for child care, access to GED or other educational programs, and partial payment of fines or restitution (Friedmann et al., 2008).

Findings from the Step'n Out Study

Friedmann et al. (2012) conducted an analysis of the Step'n Out study data to determine whether the CBM intervention compared to the control group significantly reduced substance use, crime, and re-arrests for the parolees involved in the study. The results indicate that self-reported drug-use agreed moderately with substance-positive urine screens. Individuals in the CBM group reported fewer days of alcohol use compared to the control group, but no differences

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were found between the groups for drug use. Friedmann et al. (2012) indicates the CBM group also indicated less heavy drinking compared to the control group. The CBM group demonstrated significant reductions in marijuana use and other non-hard drugs (e.g. hallucinogens and inhalants). However, the CBM group did not demonstrate significant reductions in the use of hard drugs such as heroin, cocaine, crack, and methamphetamine. The CBM group was found to have non-significant reductions in criminal activity and rearrests compared to the control group in both criminal justice administrative data and self-reported data. The CBM group and the control group did not significantly differ in terms of violations of parole (Friedmann et al., 2012).

The Relationship Between Low Self-Control and Post-Treatment Outcomes for Participants in the Collaborative Behavioral Management Intervention

Previous research has demonstrated that offenders receiving treatment for addiction and dependence when being reentered back into the community through residential drug treatment programs can reduce offending behaviors and engagement with drugs and alcohol. (Sung, Belenko, & Feng, 2001; Friedmann et al., 2008). However, Sung, Belenko, & Feng (2001) also found that when analyzing 'paths to treatment failure' for offenders in residential drug treatment, a small group of participants were persistently engaged in non-compliant behaviors that led to treatment failure. Sung, Belenko, & Feng (2001) attempted to distinguish between compliant and non-compliant offenders and found that some of the static and dynamic factors for non-compliant offenders and poor post-treatment outcomes included young age, poor education and employment background, and early involvement in the criminal justice system.

Sung, Belenko, & Feng (2001) note that the static and dynamic factors associated with non-compliant behaviors are also highly correlated with "abusing hard drugs, shorter treatment retention, and negative post-treatment outcomes" (p. 160). Sung, Belenko, & Feng (2001) note

that the same causal factors that lead to drug abuse and criminal behavior may also prevent that individual from successfully engaging in drug-treatment. Also, the offenders with the highest-rates of non-compliance when receiving treatment are considered "very disruptive… and may consume a disproportionate share of resources" (Sung, Belenko, & Feng, 2001, p. 161). Therefore, in order to minimize the negative effects that high-rate non-compliant offenders can have on the rest of the individuals receiving treatment, drug-treatment research should also address underlying personality or social dysfunctions that may be at the core of non-compliant behavior during treatment. Sung, Belenko, & Feng (2001) recommends that individuals with high-rates of non-compliance may benefit from lengthier treatment mandates, instrumental goals and positive reinforcement, and specific interventions for targeting criminogenic risk-factors.

Sung, Belenko, & Feng (2001) state that future research on non-compliance and failure to engage in treatment should investigate the underlying behavioral dimensions that causes the 'paths to treatment failure' and that future research should also investigate how possible underlying behavioral dimensions effect post-treatment outcomes. Gottfredson and Hirschi (1990) would argue that non-compliance and poor post-treatment outcomes in substance abuse treatment can be explained by behavioral dimensions related to time-stable and individual-level differences in self-control. Individuals with the lowest levels of self-control would be theoretically the most likely to be non-compliant and fail treatment because they are engaging in substance use and criminal behaviors. Therefore, Gottfredson and Hirschi (1990) would support the claims made by the persistent heterogeneity hypothesis that treatment failure is rooted in time-stable differences between offenders and non-offenders in their propensity to engage in criminal and non-compliant behaviors, specifically, as a result of personality characteristics related to impulsivity, risk-seeking, self-centeredness, volatile temper, and preferences for simple

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and physical tasks (Nagin and Paternoster, 1993; Arneklev et al., 1998; Turner and Piquero, 2002).

Sung, Belenko, & Feng (2001) recommend that researchers analyze how behavioral and personality dimensions may effect treatment outcomes. Therefore, utilizing Gottfredson and Hirschi's (1990) low self-control theory, the present research study seeks to conduct a secondary data-analysis of the Step'n Out study data to explore how low self-control traits predicts post-treatment self-reported substance use, recidivism, and analogous behaviors. Also, this research study is interested in examining how "perceptions of parole officer/counselor fairness" effect self-reported drug-use, criminal activity, and general deviance for parolees and whether the perceptions of fairness varies as a function of self-control.

Chapter 4

Methodology

This chapter will be describing the methodology used to address the research questions for testing the relationship between self-control and post-treatment outcomes. Data from the Step'n Out study will be examined through a secondary data analysis[1]. The dependent variables that will be examined for the present study include: (a) self-reported post-treatment substance use variables, (b) self-reported post-treatment recidivism variables, (c) self-reported post-treatment analogous behavior variables, (d) post-treatment total deviance, (e) and a unidimensional factor of "perceptions of parole officer/counselor fairness". The independent and control variables for this study include: (a) socio-demographic variables, (b) risk-factor variables, (c) a unidimensional factor of self-control, (d) a unidimensional factor of peer-associations, (e) the treatment condition variable, and (f) dosage effect variables. The discussion of how each of these variables is operationalized in the study is provided in this chapter. This chapter will conclude with a discussion on how missing data will be handled through regression-based imputation and the plan of analysis for the bivariate analyses, exploratory multivariate models, and confirmatory factor analysis.

Data Usage in the Present Study

The secondary-data being analyzed for this study was collected from specific instruments with in the Step'n Out study. The baseline data that was used included data from the CJ-DATS Screener, Core Intake Form, and the TCU-CESI. The three month follow-up data that was used included data from the three month follow-up Step'n Out study Program Rating Scale and the

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[1] No primary data were collected by the author of this dissertation.

CJ-DATS Core Follow-Up Form. The nine month follow-up data that was used included data from the CJ-DATS Core Follow-Up Form.

Sample

The target population for the Step'n Out study was English speaking parolees, who were at least 18 years of age with pre-incarceration substance use disorders. The study targeted parolees who have a moderate-to-high-risk of recidivism. Substance use disorders were screened for using the TCU-II Drug Screen instrument and moderate-to-high-risk for recidivism was screened for using the Lifestyle Criminality Screening Form (LCSF). Individuals were excluded from participating in the Step'n Out study if psychiatric symptoms were detected using the Structured Clinical Interview for DSM-IV (SCID) screener.

The Step'n Out study's Consolidated Standards of Reporting Trials (CONSORT) diagram (In appendix, Figure 3.01) reports the number of participants randomized and analyzed in each group for the screening, baseline, 3 month follow-up, and 9 month follow-up data collection periods (Hopewell et al., 2008; Friedmann et al., 2012). Of the 627 parolees screened for the Step'n Out study only 569 parolees were randomized to either the CBM treatment (n = 288) or control group (n = 281). Friedmann et al. (2012) reports that some of the randomized parolees (n= 93; 45 CBM and 48 controls) experienced attrition or administrative challenges related to participating in the Step'n Out study, because they were either released with less than 3 months remaining on parole or were re-arrested prior to engaging in an initial parole session, and therefore, there were only 243 CBM participants and 233 controls that received an initial session of parole (p. 1101). At the 3 month follow-up period 93% of CBM participants (n = 227) and 94% of controls (n = 220) completed the follow-up interviews. At the 9 month period 85% of

CBM participants (n = 207) and 88% of controls (n = 204) completed the follow-up interviews (Friedmann et al., 2012).

Randomization Procedure in the Step'n Out study

Friedmann et al. (2005) reported that after conducting baseline screening and assessments on prospective research participants, they utilized Urn randomization for randomly assigning research participants into either the treatment condition (Collaborative Behavioral Management intervention) or control group (standard parole). Urn randomization allowed the Step'n Out study researchers to balance out the potential effects of gender, length of current incarceration (18 months or less vs. more than 18 months), in prison treatment status, and risk for recidivism based on the LCSF scores. Friedmann et al. (2005) states that Urn randomization "adjusts the probability of a subject with certain stratifying characteristics being assigned to a condition based on the stratifying characteristics and condition assignment of previous subjects... As a result the selection process is systematically weighted toward maintaining balance while continuing to retain randomization as the primary process" (p. 18). However, it can be argued that the Step'n Out study failed to control for self-reported differential levels in self-control between research participants when randomizing participants to both the treatment condition and control group because the researchers did not provide a theoretical justification for the variables utilized in the balancing and stratification process. Langton (2006) reported that levels of low self-control for juvenile offenders fell within a normal distribution. The present research study will also analyze the distribution of low self-control and whether there are statistically significant differences in levels of low self-control between the treatment and control groups.

Dependent Variables

The present study has 18 binary coded outcome variables that are the same for both the 3 and 9 month follow-up periods and are organized by post-treatment substance use, recidivism, analogous behaviors, and total deviance. Fifteen of the outcome variables are originally from the CJ-DATS Core Follow-Up Forms and were originally coded as categorical or continuous variables and have been transformed into dichotomously coded variables for this study. Four of the variables were created using various combinations of the original fifteen variables from the CJ-DATS Core Follow-Up Forms at both the 3 and 9 month follow-up periods. The study has also conducted a factor analysis of the 20-items listed on the 3 month follow-up Program Rating Scale, developed by Jennifer Skeem, Ph.D., to create a unidimensional factor of "Perceptions of Parole Officer/Counselor Fairness" and will be further discussed below (Friedmann et al., 2005).

Post-Treatment Substance Use Variables. Post-treatment substance use is a commonly used outcome to assess whether an experimental drug-treatment intervention has long-term residual effects on reducing the illicit drug use of research participants after the treatment period has terminated (Sung et al., 2001; Lipsey and Cullen, 2007; Taxman, 2012; Friedmann et al., 2012). Gottfredson and Hirschi (1990) argue that adults with low levels of self-control are unlikely to respond to experimental drug-treatment interventions and criminal justice sanctions because their behavioral and personality traits have been stabilized in childhood and are not amenable to change through artificial environments. Therefore, to test Gottfredson and Hirschi's (1990) low self-control theory, post-treatment substance use was measured using self-reported data collected at both the 3 and 9 month follow-up periods from parolees.

The post-treatment substance use outcome variables are measured at the recall period in the 3 and 9 month follow-up interviews. Therefore, the outcome variables in the 3 month follow-

up interview measure substance use from the initial parole session to the 3 month follow-up interview. The outcome variables from the 9 month follow-up interview measure substance use between the 3 month follow-up interview and the 9 month follow-up interview. One of the post-treatment substance use variables measuring consumption of alcohol use was operationalized as a dichotomous variable: 0 = less than 1 time a week and 1 = more than 1 time a week. Four of the post-treatment substance use variables measured specific types of drug use such as marijuana, crack, cocaine, and heroin which were operationalized as dichotomous variables: 0 = did not use illegal drug and 1 = did use illegal drug at least once. The post-treatment substance use variables will also be recoded for this study into discrete dichotomously coded values that include: 0 = data not missing and 1 = data missing.

The recoded post-treatment substance use data will be used for determining whether the low self-control factor can predict whether parolees in both the treatment and control group had missing post-treatment substance use data or not. The researcher will also create two combined variables called Post-Treatment Drug Use measured at the 3 month follow-up and Post-Treatment Drug Use measured at the 9 month follow-up. The combined variables specifically measure whether the parolees engaged in any drug use related to marijuana, crack, cocaine, or heroin and is dichotomously coded as: 0 = never used illegal drugs and 1 = used illegal drugs at least once.

Post-Treatment Recidivism Variables. Post-treatment recidivism is a commonly used outcome to determine whether an experimental drug-treatment intervention has long-term residual effects on reducing the recidivism of research participants after the treatment period has terminated (Sung et al., 2001; Lipsey and Cullen, 2007; Longshore and Turner, 1998; Taxman, 2012; Friedmann et al., 2012). Friedmann (2005) defines recidivism as the "Number of arrests or

technical violations since release" (p. 35). This research study will measure eight post-treatment recidivism, self-reported, outcome variables at both the 3 and 9 month follow-up periods. Four of the post-treatment recidivism variables are related to crimes involving substance use, such as, public intoxication, driving while intoxicated, illegal drug use, and illegal drug sales which were operationalized as dichotomous variables: 0 = did not perform illegal act and 1 = did perform illegal act.

Four other post-treatment recidivism measures include number of nights in jail (recall period), total number of days incarcerated (recall period), number of times committed probation/parole violation (recall period), and physically/verbally threatened someone (recall period) which were operationalized as dichotomous variables: 0 = event did not occur and 1 = event occurred at least once. The post-treatment recidivism variables will also be recoded for the study into discrete dichotomously coded values that include: 0 = data not missing and 1 = data missing.

The recoded post-treatment recidivism data will be used for determining whether the low self-control factor score can predict whether parolees in both the treatment and control group had missing post-treatment recidivism data or not. The researcher will also create two combined variables called Post-Treatment Recidivism measured at the 3 month follow-up and Post-Treatment Recidivism measured at the 9 month follow-up. The combined variables specifically measure whether the parolee engaged in any recidivism related to all of the eight variables mentioned above and is coded as: 0 = never recidivated and 1 = recidivated at least once.

Post-Treatment Analogous Behavior Variables. The outcome variables in the post-treatment analogous behaviors category is commonly conceptualized as risky behaviors that are not illegal but nonetheless hazardous to one's own health or the health of others. Gottfredson and

Hirschi (1990) theorize that individuals with low self-control may not always engage in crime but are highly likely to be frequently engaging in analogous behaviors, for example, risky or illicit sexual practices (p. 89). Therefore, this study will be operationalizing post-treatment analogous behaviors by measuring risky sexual practices.

The post-treatment analogous behaviors include the number of times the parolee had sex without a condom with a casual partner in the past 30 days and the number of times the parolee had sex without a condom with someone who smokes crack/cocaine in the past 30 days which were operationalized as dichotomous variables: 0 = event did not occur and 1 = event did occur at least once. Also this study measured the number of people the parolee had sex with in the past 30 which was operationalized as a dichotomous measure: 0 = one or less people and 1 = two or more people. The post-treatment analogous behavior variables will also be recoded for the present study into discrete dichotomously coded values that include: 0 = data not missing and 1 = data missing.

The recoded post-treatment analogous behavior data will be used for determining whether the low self-control factor can predict whether parolees in both the treatment and control group had missing post-treatment analogous behavior data or not. The researcher will also create two combined variables called Post-Treatment Analogous Behaviors measured at the 3 month follow-up and Post-Treatment Analogous Behaviors measured at the 9 month follow-up. The combined variables specifically measure whether the parolee engaged in any analogous behaviors related to the number of times the parolee had sex without a condom with a casual partner in the past 30 days and the number of times the parolee had sex without a condom with someone who smokes crack/cocaine in the past 30 days which were operationalized as

dichotomous variables: 0 = never engaged in analogous behaviors and 1 = engaged in analogous behaviors at least once.

     Post-Treatment Total Deviance Variables. The outcome variables in the post-treatment total deviance category is commonly conceptualized in sociology as behaviors that violate social norms which includes both informal violations of common social practices and formal violations of established criminal laws (Akers, 1997). This study examines the relationship between low self-control traits and self-reported engagement in deviance occurring among parolees participating in the Step'n Out study. Gottfredson and Hirschi's low self-control theory would hypothesize that individuals with low self-control traits will self-report higher levels of engagement in post-treatment deviance compared to parolees with high self-control traits. Total deviance was measured in three different ways for the present study.

     First, total deviance was measured at the 3 month follow-up as a factor score by factor analyzing the individual post-treatment substance use, recidivism, and analogous behavior variables measured at the 3 month follow-up. The construct total deviance at the 3 month follow-up was measured using 14-items from the substance use, recidivism, and analogous behaviors data. Using a confirmatory factor analysis approach that is presented in chapter 6, this measure allowed this research study to examine the relationship between low self-control, peer-associations, perceptions of fairness, and the control variables direct and indirect effects on the total deviance construct measured at the 3 month follow-up period.

     An exploratory factor analysis was conducted which indicated that the 14-items loaded on to five different factors. However, a one factor solution was used with an alpha reliability of 0.806 because previous research indicates that unidimensionality exists when there is a significant drop-off in Eigen values between the first (4.298) and second (1.613) factors and

when smaller drop-offs exists between subsequent factors (Cretacci, 2008; Tittle et al., 2003). The first factor explains 30% of the total variation in those items as a linear combination.

Second, total deviance was measured at the 9 month follow-up as a factor score by factor analyzing the individual post-treatment substance use, recidivism, and analogous behavior variables measured at the 9 month follow-up. The construct total deviance at the 9 month follow-up was measured using 14-items from the substance use, recidivism, and analogous behaviors data. Using a confirmatory factor analysis approach that is presented in chapter 6, this measure allowed this research study to examine the relationship between low self-control, peer-associations, perceptions of fairness, and the control variables direct and indirect effects on the total deviance construct measured at the 9 month follow-up period.

An exploratory factor analysis was conducted which indicated that the 14-items loaded on five different factors. However, a one factor solution was used with an alpha reliability of 0.761 because previous research indicates that unidimensionality exists when there is a significant drop-off in Eigen values between the first (3.587) and second (1.636) factors and when smaller drop-offs exists between subsequent factors (Cretacci, 2008; Tittle et al., 2003). The first factor explains 26% of the total variation in those items as a linear combination.

Finally, the fifth way of measuring total deviance was done by computing the change in regression factor scores between the 3 and 9 month follow up period for total deviance variables. The change in total deviance over time will be tested in CFA to determine whether the theoretically specified constructs self-control, peer-associations, and fairness can directly and indirectly predict changes in deviance factor scores.

Perceptions of Parole Officer/Counselor Fairness Factor. The outcome variable "Perceptions of Parole Officer/Counselor Fairness" was measured using 20-items (In appendix,

Table 4.01) from the 3 month follow-up Program Rating Scale assessing the parolees self-rating

of their relationship with their parole officer and drug counselor. This measure will allow the

present research study to examine the relationship between low self-control traits and perceptions

of fairness. Wolfe (2011) discusses how empirical research demonstrates that when police

officers treat people with respect, explain their decisions, and create dialogue with the

communities that they police, then they are more likely to build long-term rapport, trust,

compliance, and be obeyed by members of the community (Tyler, 2003; Reisig et al., 2011).

A factor analysis was conducted which indicated that the 20-items loaded on four

different factors. However, a one factor solution was used with an alpha reliability of 0.97

because previous research indicates that unidimensionality exists when there is a significant

drop-off in Eigen values between the first (8.447) and second (1.963) factors and when smaller

drop-offs exists between subsequent factors (Cretacci, 2008; Tittle et al., 2003). The first factor

explains 42% of the total variation in those items as a linear combination.

Independent Variables

Social-Demographic Variables. Several social-demographic characteristics were used as

statistical controls and were selected for based on the empirical literature discussed in Chapter 2.

The data for these variables were collected at baseline using the CJ-DATS Screener. The

demographic variables include: (a) age, (b) non-white, and (c) male. Age is a continuously scaled

variable, which indicates the parolee's age at intake. White was operationalized as a

dichotomous variable to indicate the race of the parolee (0 = white, 1 = non-white). Male is a

dichotomous variable to indicate the gender of the parolee (0 = female and 1 = male).

Risk-Factor Variables. Several risk-factors that predict post-treatment drug use and

recidivism were used as statistical controls and were selected for based on the empirical literature

summarized in Chapter 2. The data for these variables were collected at baseline in the CJ-DATS Screener. The risk-factors that will be analyzed are (a) age at first arrest, (b) dropped out of school, and (c) divorce status. Age at first arrest will be operationalized as a dichotomously coded variable (0 = less than 19 years of age or 1 = greater than 19 years of age). Dropped out of school will be operationalized as a dichotomously coded variable (0 = did not drop out of school or 1 = yes did drop out of school). Divorce status will be operationalized as a dichotomously coded variable (0 = never divorced/single or 1 = divorced one or more times).

Self-Control Factor. Self-reported questions selected from The Texas Christian University Client Evaluation of Self at Intake (TCU-CESI) Form at baseline (In appendix, Table 4.02) were used to construct a scale to measure the behavioral and attitudinal traits of low self-control (i.e., impulsivity, risk-seeking, preference for simple tasks, self-centeredness, and temper). Questions were selected based on their similarity to scales found in previous tests of low self-control theory summarized in the empirical literature in Chapter 2 (Grasmick et al., 1993; Langton, 2006; Longshore et al., 1996; Arneklev et al., 1998; Tittle et al., 2003; Crettaci, 2008). Each of the 23 items in the scale were coded in the direction of low self-control using a 5 point Likert response scale (1 = Disagree Strongly to 5 = Agree Strongly; 1 = Agree strongly to 5 = Disagree Strongly).

A factor analysis was conducted using imputed data which indicated that the 23-items loaded on five different factors (In appendix, Table 4.02). However, a one factor solution was used with an alpha reliability of 0.85 because previous research indicates that unidimensionality exists when there is a significant drop-off in Eigen values between the first (5.518) and second (2.174) factors and when smaller drop-offs exists between subsequent factors (Cretacci, 2008; Tittle et al., 2003). The first factor explains 24% of the total variation in those items as a linear

combination. Looking at the Scree-Plot it is observed that only one component sets itself apart from the others in terms of efficiently explaining a high degree of variation across the 23-items. Below, figure 4.01 illustrates the normal distribution of low self-control factor scores after the factor analysis was conducted.

Figure 4.01. Frequency Histogram of Self-Control Factor Scores
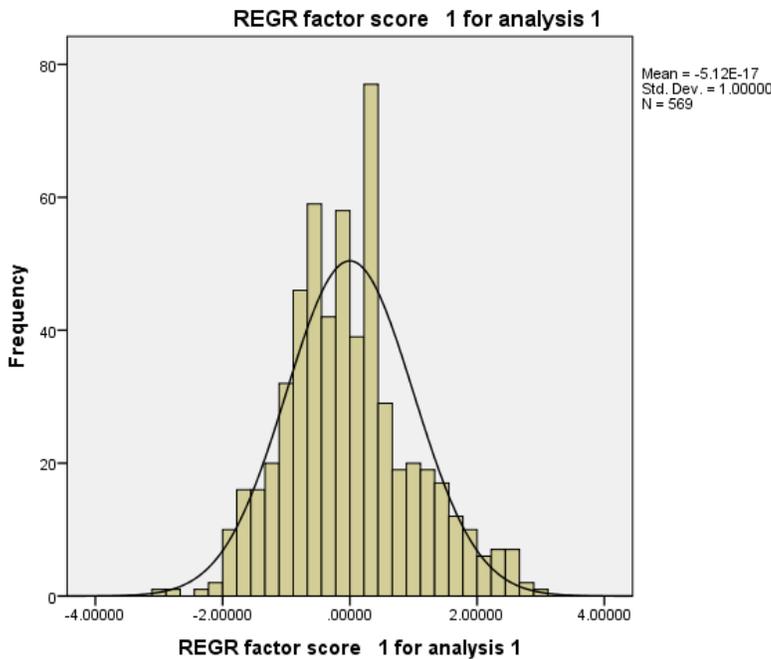
Peer-Associations Factor. Self-reported questions TCU-CESI Form at baseline (In appendix, Table 4.03) were used to construct a scale to measure the effects of negative peer associations based on Aker's (1997) social learning theory. Questions were selected based on their similarity to scales found in previous tests of social learning (Wright et al., 2001; Yarbrough et al., 2011; Burrus et al., 2012). The questions asked about the criminal behaviors of the parolee's friends. Each of the 7 items in the scale were coded in the direction of negative peer associations using a 5 point Likert response scale (0 = Never to 5 = Always). A factor analysis was conducted using imputed data which indicated that the 7-items loaded on one factor (In

appendix, Table 4.03). Therefore, a one factor solution was used with an alpha reliability of 0.84. The one factor explains 51% of the total variation in those items as a linear combination.

Treatment Condition Variable. The Step'n Out study is a randomized controlled trial of the Collaborative Behavioral Management intervention, therefore, the present study is seeking to determine whether the intervention compared to the control (standard parole) moderates the relationship between low self-control and post-treatment drug use, recidivism, and analogous behaviors. The treatment condition is operationalized as a dichotomously coded variable (0 = Control Group or 1 = Treatment Group).

Dosage Effect Variables. The Step'n Out study collected dosage effect data on the parolees involved in both the Collaborative Behavioral Management intervention and the control group only at the 3 month follow-up. The dosage effect data will be controlled for in the theoretically specified regression models along with demographic and risk-factor variables when predicting post-treatment outcome variables and the perception of fairness factor score. This research study will be controlling for the level of dosage using both continuous and dichotomously coded data because parolees in both the treatment and control group may have had different degrees of exposure to parole officers and substance abuse counselors while participating in the Step'n Out study. The four continuously coded variables that will be controlled for in this study were originally collected by the researchers (Friedmann et al., 2008) who conducted the Step'n Out study and includes data related to: (1) Average number of minutes for individual sessions with parole officer (CBM and Control group), (2) Average individual sessions per month with parole officer (CBM and Control group), (3) Average number of minutes for individual sessions with substance abuse treatment counselor (CBM and Control

group), and (4) Average individual sessions per month with substance abuse treatment counselor (CBM and Control group).

Missing Data

Dummy Variable Adjustment: Missing data is problematic for the Step'n Out study, because it may indicate a self selection bias is occurring for the parolees who have volunteered to remain in the study from start to finish. Low self-control theory hypothesizes that parolees with low self-control are hypothesized to fail or drop out of treatment due to their inability to maintain commitments and relationships (Gottfredson and Hirschi, 1990). Therefore, this study examined whether parolees with missing data are significantly different from parolees with available data.

Porter and Ecklund (2012) provide an extensive discussion on "active nonresponders" in a study that they conducted on the religiousity of scientists. Active nonresponders are described as research participants that complete a portion of the study but refuse to or are unable to complete the rest of the survey for individual-level reasons. Porter and Ecklund (2012) found that when asking scientists controversial research questions regarding religious preferences and beliefs that scientists were less likely to respond to controversial questions. Porter and Ecklund (2012) specifically state that:

> "We link their data patterns to family formation, religious
> socialization, and present religiousity… traditional statistics do not
> always help us understand the reasons behind missing data and low
> survey-response rates. Lastly, select populations may display
> unique missing data patterns that need to be understood" (p. 450 –
> 451).

Porter and Ecklund (2012) discuss how the most basic form of data can be dichotomized into discrete categories: unobserved (missing) and observed (non-missing). They also discuss how the proportion of observed to unobserved data effects the reliability of coefficient estimates

and that it is a "zero-sum" relationship. Therefore, the higher proportion of unobserved to observed data would increase the unreliability of the coefficient estimates.

Porter and Ecklund (2012) discuss the levels of missingness in data. If missingness is independent of observed and unobserved data, then the data is considered *missing completely at random* (MCAR). However, if missingness is dependent on both the observed and unobserved data it is labeled as *missing not at random* (MNAR). Porter and Ecklund (2012) also state that if missingness is independent of the unobserved data, but conditional on the observed data, then it is considered missing at random (MAR). Porter and Ecklund (2012) state that missingness can be ignored if the missing data is considered MCAR or MAR, but if "item non-response" is related to MNAR it is not ignorable because it is dependent on observed and unobserved data. Missing data considered as MNAR suggests that there is a non-response pattern in the data collection that is associated with a "trend in sociodemographics, attitudes, or other categorizing indicator of the sample" (p. 451). Therefore, Porter and Ecklund (2012) state that high rates of missing data on survey items are less reliable indicators of the research area being studied. The implications of basing policies and treatment interventions off of research studies that do not account for missing data may fail to yield expected outcomes in future implementations of the policies or interventions (Porter and Ecklund, 2012).

The researchers conducted logistic regressions using the outcome variables dichotomously coded as having observed or unobserved data, in order to understand the underlying demographic or personality mechanisms producing item non-response on their survey of the religiosity of scientists (Porter and Ecklund, 2012). The researchers found that predictor variables traditionally believed to account for missing data did not significantly predict missing data. The researchers found individuals who were female, had higher levels of income, and were

racially coded white were less likely to respond to questions about religious views. Scientists that were actively involved in religious activities and are strongly attached to religious beliefs were more likely to respond to religion questions. Therefore, Porter and Ecklund (2012) discuss how item non-response reveals significant patterns in the demographic and personality characteristics of the non-responding populations.

This study conducted dummy variable adjustment by coding data for a subset of the post-treatment outcome variables with missing data as dichotomously coded observed or unobserved data from both the 3 and 9 month follow-up periods. The subset of recoded post-treatment outcome variables was tested against the predictor variable low self-control factor score using an Independent Samples t-test. The present research study hypothesizes that the patterns in the missing outcome variable data can be explained by the low self-control factor score. Therefore, individuals with missing data in their post-treatment outcome responses are hypothesized to have higher low self-control factor scores compared to individuals with non-missing data (higher factor score value equals lower levels of self-control). For a subset of post-treatment outcome missing data variables, logistic regression analysis was conducted to test whether the missing data can be explained by the predictors: socio-demographic variables, risk-factor variables, peer-association factor score, low self-control factor score, moderator variable, dosage effect variables, and treatment condition.

Median Imputation: Median imputations were conducted on the demographic variables age, non-white (race), and male (gender). Median imputations were also conducted on the risk-factor variables age at first arrest, dropped out of school, and divorce status. Median imputations were conducted to add more cases and to increase the power of prospective bivariate, multivariate, and confirmatory analyses.

Regression-Based Imputation: Regression-based imputations were conducted for the 23 self-control items and the 7 peer-association items (In appendix, Table 4.02 and 4.03). The predictor variables that were used for developing the regression coefficients for predicting the outcome variables were age, non-white, male, age at first arrest, dropped out of school, and divorce status. The steps taken to complete the regression-based imputation for each theoretically-based item included initially running the regression analysis with the demographic and risk-factor variables as predictor variables on each theoretically-based item as an outcome variable where the cases with missing outcome data would be listwise-deleted. After the initial regression analysis was completed then the researcher used the regression formula for each individual item and inputted the predictor variables with missing outcome data into the regression formula to compute the predicted outcome value for each individual theoretically based-item with missing data. The major limitation for the regression-based imputation is that it underestimates standard errors by underestimating the variance in the predictor values used to develop the regression formulas.

Hypotheses

Based on the first research question presented at the end of chapter 3, this study hypothesizes that low self-control separately predicts an increase in the following post-treatment outcomes: (a) substance use, (b) recidivism, (c) analogous behaviors, and (d) total deviance when controlling for age, gender, race, age at first arrest, education status, relationship status, peer associations, treatment condition, and dosage data. The moderator hypothesis for the first research question is that the treatment intervention will reduce the strength of the relationship between low self-control and the post-treatment outcomes. The model diagrammed in figure 4.02 has three causal paths that effect the post-treatment outcomes: "the impact of the noise intensity

as a predictor (Path a), the impact of controllability as a moderator (Path b), and the interaction

or product of these two (Path c). The moderator hypothesis is supported if the interaction (Path c)

is significant" (Baron and Kenny, 1986, p. 1174). Baron and Kenny (1986) report that there may

be significant main effects for both the predictor and moderator, however, the main effects are

not conceptually relevant to testing the moderator hypothesis. Baron and Kenny (1986) also

report that the moderator variable should be uncorrelated to both the predictor and outcome

variable in order to clearly interpret the interaction term between the predictor and moderator

(Path c). Moderators and predictors are both considered exogenous variables and are always

considered independent variables that are causally antecedent to the outcome variable (Baron and

Kenny, 1986).

Figure 4.02. Moderator Model for Research Question 1
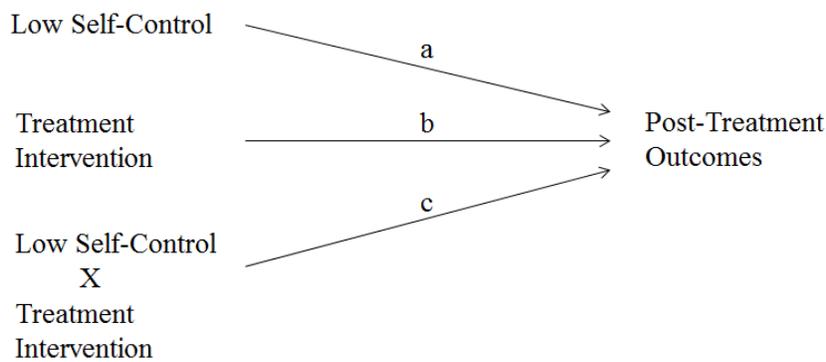
Based on the second research question presented at the end of chapter 3, this study

hypothesizes that low self-control predicts a decrease in the parolees' "perceptions of parole

officer/counselor fairness" when controlling for age, gender, race, age at first arrest, education

status, relationship status, peer associations, treatment condition, and dosage variables. The

moderator hypothesis for the second research question is that the treatment intervention will

increase the strength of the relationship between low self-control and parolee "perceptions of

parole officer/counselor fairness" (Figure 4.03). That is parolees with low self-control in the CBM intervention will have stronger perceptions of fairness compared to parolees with low self-control in the control group.

Figure 4.03. Moderator Model for Research Question 2

Low Self-Control
              a

Treatment   b   Perceptions of Parole
Intervention   Officer/Counselor
                        Fairness
            c

Low Self-Control
    X
Treatment
Intervention
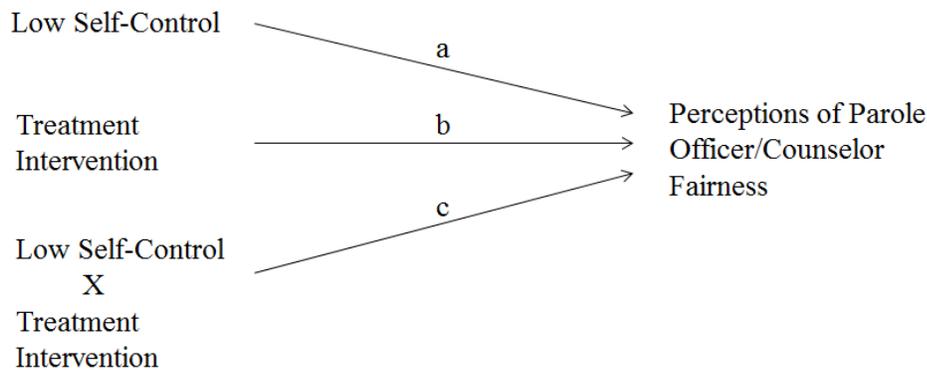
Based on the third research question presented at the end of chapter 3, this study hypothesizes that the self-control factor will be a stronger predictor of the perceptions of fairness latent factor when compared to the peer-associations factor predicting perceptions of fairness. The direct and indirect relationships will be tested using a Confirmatory Factor Analysis approach in AMOS v.21. The structural equation modeling (SEM) factor model will analyze the correlational relationship between the latent structures self-control and peer-association factors.

The factor model will also compare the direct effects of the self-control and peer-association latent factors on the perceptions of fairness factor. The factor model will also measure the direct and indirect effects of self-control, peer-associations, and perceptions of fairness on the exploratory factors: post-treatment total deviance measured at both the 3 and 9 month follow-up periods. The SEM final and full structural model, in figure 4.04, will conduct the same analysis as in the factor model but will also control for demographic, risk-factors, and treatment condition variables, in order to understand whether the strength of the effects of self-

control, peer-associations, and perceptions of fairness on the post-treatment total deviance factor measured at both the 3 and 9 month follow-up periods remain after introducing the control variables.

Figure 4.04. SEM Full Structural Model for Research Question 3
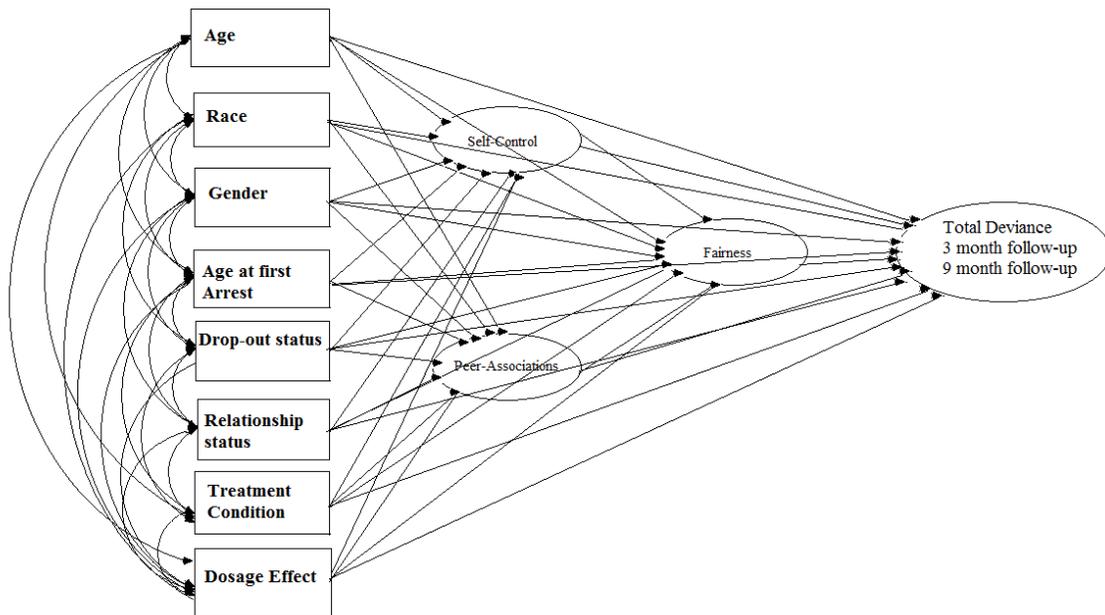
Plan of Analysis

The following section will describe the plan for the secondary data analysis of the Step'n Out study data that will be conducted using the IBM Statistical Package for the Social Sciences (SPSS) version 20 software. This section will describe the univariate, bivariate, exploratory multivariate, and confirmatory multivariate factor analysis of predictors and outcomes that will be conducted on the Step'n Out study data. The exploratory multivariate analyses section will specifically discuss how the moderator hypothesis will be tested for both research questions 1 and 2. The confirmatory multivariate factor analysis section will specifically discuss how

structural equation modeling will be utilized to help explain the direct and indirect effects that

the theoretically specified latent constructs low self-control and peer-associations have on

predicting perceptions of fairness and post-treatment total deviance outcomes.

Univariate Analysis. Univariate statistics will be conducted because they provide

descriptive information on the distributions of each of the independent and outcome variables.

To evaluate the univariate statistics for all of the variables in this study, descriptive statistics

were computed and output will be presented in tables in chapter 5. The descriptive statistics will

include measures of central tendency and measures of dispersion. Descriptive statistics will be

computed and presented as tables in chapter 5, because tables are a useful way of summarizing

the distribution of data with in variables.

Bivariate Analysis. Bivariate analyses were conducted using an independent samples *t*-

test for comparing the continuously scaled Low Self-Control factor score mean for the treatment

condition, social-demographic, risk-factor, and post-treatment outcome variables which are

categorical variables. Also bivariate analyses were conducted using an independent samples *t*-

test for comparing missing and non-missing data in the post-treatment outcomes using the

continuously scaled Low Self-Control factor score mean. Finally, a Pearson's r correlational

analysis was conducted to examine the linear relationship between continuously scaled variables,

for example, low self-control and "perceptions of parole officer fairness".

Multivariate Analysis. A series of multivariate analyses were conducted on data to test

the effects of predictor (independent) variables on criterion (outcome) variables. Specifically,

this study utilized multiple regression analysis for outcome variables that are continuously coded

as ratio/interval data and used logistic regression analysis for outcome variables that were

discretely coded as binary variables. The output that will be reported and interpreted for the

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multiple regression analysis include the r^2, F-value, model significance, unstandardized and standardized regression coefficients, and significance of coefficients. This study also reports whether the basic assumptions of each multiple regression analysis was met for linearity, normality, homoscedasticity, and independence. This also reports the residual by predicted plot values, predicted probability plot values, Durbin-Watson test values, and Variance Inflation Factors (VIFs) and Tolerance levels to test for multicollinearity. Tolerance levels above 0.10 and VIF scores below 4.0 will be considered acceptable for the present study.

The output that will be reported and interpreted for the logistic regression analysis includes the -2 log likelihood for the fully reduced model and the related χ^2 for the full model and related significance levels to determine if inputting independent variables improves the model fitness. The results that are reported and interpreted in chapter 5 include the odds-ratios and significance levels for each independent variable.

The moderator hypothesis for research questions 1 and 2 was tested by computing an interaction term between the independent variable (self-control factor score) and the moderating variable (treatment condition). In order to avoid issues with multi-collinearity, the self-control factor score for each case was centered by subtracting the overall mean from each individual case for the self-control factor score. Next, an interaction was computed between the centered self-control factor score and the treatment condition by multiplying the two variables. Finally, both of the main effects (low self-control factor score and treatment condition), the interaction term, and control variables will be entered into the model to predict the dependent variables.

Confirmatory Multivariate Factor Analysis. In order to examine the effect of low self-control and peer-associations on perceptions of fairness, structural equation modeling (SEM) techniques are used (Porter, 2008). The SEM technique allowed this research study to measure

the effects of the latent and immeasurable constructs (low self-control and peer-associations) on the totally endogenous and immeasurable constructs perceptions of parole officer/counselor fairness and total deviance measured at both the 3 and 9 month follow-up periods. Confirmatory factor analysis will allow the present research study to develop a factor model using the items for each respective factor (low self-control, peer-association, and perceptions of fairness).

Porter (2008) states that this technique allows for closer examination of the effects from the social-demographic variables, risk-factor variables, and treatment condition/dosage effect variables, which previous literature argues are important for predicting perceptions of fairness and post-treatment total deviance (p. 48). This technique examined both the direct and indirect effects of the control variables through the intervening low self-control and peer-association constructs via the recursive model structure presented in figure 4.04 (Porter, 2008).

The models were specified to reflect the literature on both the effects of low self-control factor and peer-associations factor on the perceptions of fairness factor and the debate about which theoretical construct is a stronger predictor of the post-treatment total deviance construct. The factor model examined the direct and indirect effects of the low self-control and peer association constructs on the perceptions of fairness construct and post-treatment deviance factor without the observable control variables. This model allowed for the examination of the direction and magnitude of any existing relationships between the constructs.

The final full structural model (figure 4.04) included all of the social-demographic variables, risk-factor variables, and treatment condition/dosage effect variables along with the low self-control and peer association constructs to decompose any indirect effects on the perceptions of fairness construct and post-treatment deviance factor measured at both the 3 and 9 month follow-up periods. Porter (2008) states that the final structural model decomposes all of

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the effects of the fully exogenous control variables indirectly through low self-control and peer-association constructs, allowing for the possible identification of what may amount to spurious relationships due to common causes in the antecedent control variables (p. 48).   The final structural model included all of the control variables, the low self-control construct, peer-association construct, the perceptions of fairness construct, and post-treatment deviance. The final structural model examined the direct and indirect effects that the control variables and theoretical constructs have on post-treatment outcomes measured at the 3 and 9 month follow-up periods.

Because of the effects of the control variables, low self-control, peer-association, and perceptions of fairness constructs on the post-treatment total deviance outcomes is centered on static and dynamic risk-factors, the specification of the model is heavily influenced by criminological theory and previous empirical findings (Gottfredson and Hirschi, 1990; Akers, 1997; Tyler, 2003; and Langton, 2006). The control variables were treated as totally exogenous variables with both direct and indirect effects on the endogenous perceptions of fairness construct and total deviance factor. The direct effects were examined via the low self-control and perceptions of fairness constructs. These model specifications are grounded in theory, as previous literature has demonstrated that the interactional relationships between an individual's social-demographic characteristics, risk-factors, treatment condition/dosage levels, and their social-personality characteristics which develop over time and are assumed to be static over the life course are presumed to be predictive of post-treatment total deviance (Gottfredson and Hirschi, 1990).

Chapter 5

Exploratory Analysis Results

The exploratory analysis results chapter will be presenting statistical findings from this study based on the research questions presented at the end of chapter 1 and is divided into three parts. The first part of chapter 5 provides the univariate descriptive statistics for the independent variables: social-demographic, risk-factor, and treatment condition/dosage variables. The first part of chapter 5 also provides the univariate descriptive statistics for the dependent variables measured at the 3 and 9 month follow-up periods: post-treatment substance use, recidivism, analogous behaviors, and total deviant behavior. The univariate descriptive statistics will provide the mean, standard deviation, range, and percentage of available and missing data.

The second part of chapter 5 provides the bivariate analysis results for the independent sample *t*-tests that were conducted using the dependent variable, low self-control factor score. The independent variables that were analyzed for the independent samples *t*-tests are dichotomously coded and include the treatment condition variable, social-demographic variables, risk-factor variables, post-treatment substance use, recidivism, analogous behaviors, total deviant behavior, and a selection of variables with missing data. The independent samples *t*-test results for significant findings also include graphs that illustrate the distribution of the low self-control factor score for the dichotomously coded independent variables. The second part of chapter 5 concludes with a Pearson's r analysis of correlations between continuously coded data, such as, age, low self-control factor score, peer-association factor score, perceptions of fairness factor score, and dosage effect variables. Statistically significant correlations are interpreted and described.

The third and final part of chapter 5 provides the multivariate analysis results. The third part includes a series of logistic regression analyses for predicting post-treatment outcomes measured at both the 3 and 9 month follow-up periods using the low self-control factor score and control variables. The multiple regression analysis is used to predict the perception of fairness factor score while including the low self-control factor score and control variables. The predictor variables that are entered into both the logistic regression analyses and the multiple regression analysis include: the social demographic, risk-factor, dosage effect, peer-association factor score, low self-control factor score, treatment condition, and moderator variable (low self-control factor score and treatment condition). Significant findings from the exploratory analyses are presented and interpreted.

I. *Univariate Descriptive Statistics.*

Social-Demographic Data.

Table 5.01. Social-Demographic Data Descriptive Statistics

Social-Demographic Data			Social-Demographic Imputed Data		
	Mean	**Standard Dev.**		**Mean**	**Standard Dev.**
Age	33.91	8.94	**Age**	33.91	8.92
	N	**Percent**		**N**	**Percent**
Gender			**Gender**		
Female	91	16.00	Female	91	16.00
Male	447	83.80	Male	478	84.00
Missing	1	0.20	Missing	0	0.00
Race			**Race**		
White	199	35.00	White	199	35.00
Non-White	360	63.30	Non-White	370	65.00
Missing	10	1.80	Missing	0	0.00

In table 5.01, the social-demographic data was analyzed on the parolees participating in the Step'n Out study in order to illustrate the distribution of the total sample group in terms of their age, gender, and racial composition (n = 569). Using the median-based imputed data, in table 5.01, the mean age of parolees in the Step'n Out study was 33.91 with a standard deviation of 8.92. Using the median-based imputation gender data, females were 16% (n = 91) of the sample and males were 84% (n = 478) of the overall. Using the median-based imputation race data, parolees that identified as white were 35% (n = 199) of the sample and parolees that identified as black or other minorities were 65% (n = 370) of the sample. The next section will analyze risk-factor data.

Risk-Factor Data.

Table 5.02. Risk-Factor Data Descriptive Statistics

Risk-Factors Data	N	Percent	Risk-Factors Imputed Data	N	Percent
High School Dropout			**High School Dropout**		
No	189	33.20	No	189	33.20
Yes	377	66.30	Yes	380	66.80
Missing	3	0.50	Missing	0	0.00
Age at first arrest			**Age at first arrest**		
< 19 years old	415	72.90	< 19 years old	418	73.50
>= 19 years old	151	26.50	>= 19 years old	151	26.50
Missing	3	0.50	Missing	0	0.00
Number of times divorced			**Number of times divorced**		
Never divorced/single	408	71.70	Never divorced/single	411	72.20
One divorce or more	158	27.80	One divorce or more	158	27.80
Missing	3	0.50	Missing	0	0.00

In table 5.02, the risk-factor data was analyzed on parolees participating in the Step'n Out study in order to illustrate the distribution of the total sample group in terms of their high school dropout status, age at first arrest, and number of times divorced (n =569). Using the median-

based imputation data, in table 5.02, parolees who self-reported dropping out of high school were

66.80% (n = 380) of the sample and parolees who did not self-report dropping out of high school

were 33.30% (n = 189) of the sample. Using the median-based imputation age at first arrest data,

parolees that self-reported being arrested before the age of 19 were 73.50% (n = 418) of the

sample and parolees that self-reported being arrested at or after the age of 19 were 26% of the

sample (n = 151). Using the median-based imputation for number of times divorced data,

parolees that self-reported never being divorced or single were 72.20% (n = 411) of the sample

and parolees that self-reported having one divorce or more are 27.80% (n = 158) of the sample.

The next section will analyze the treatment condition and the data for the dosage variables.

Treatment Condition and Dosage Data.

Table 5.03. Step'n Out study Treatment Condition and Dosage Data Descriptive Statistics

Step'n Out study Treatment Condition	N	%
Collaborative Behavioral Management	288	50.6
Standard parole and substance abuse treatment	281	49.4

Dosage Data	N	Mean	Standard Dev.	Low	High	Missing N(%)
Average number of minutes for individual sessions with parole officer (CBM and Control Group)	352	22.18	14.76	0	100	217 (38.1)
Average individual sessions per month with parole officer (CBM and Control Group)	342	3.29	1.71	0	20	227 (39.9)
Average number of minutes for individual sessions with substance abuse treatment counselor (CBM and Control Group)	343	39.37	31.18	0	150	226 (39.7)
Average individual sessions per month with substance abuse treatment counselor (CBM and Control Group)	337	2.75	2.81	0	20	232 (40.8)

In table 5.03, the treatment condition and dosage effect variables were analyzed to illustrate the distribution of criminal justice and substance use treatment services received by parolees participating in the Step n' Out study. Parolees randomly assigned to the Collaborative Behavioral Management intervention were 50.6% (n = 288) of the total sample size and parolees randomly assigned to standard parole and substance use treatment (control group) were 49.4% (n = 281) of the total sample size. The average number of minutes for individual sessions with parole officer for both the CBM intervention and control group (n =352) was 22.18 minutes with a standard deviation of 14.76 minutes.

Post-Treatment Drug Use 3 and 9 Month Follow-Up Data.

Table 5.04. Descriptive Statistics for Post-Treatment Substance Abuse Data Measured at the 3 and 9 Month Follow-up Periods

	3 Month Follow-Up			9 Month Follow-Up		
Self-Report Post-Treatment Alcohol Use Variable	**Less Than 1 Time A Week (%)**	**More Than 1 Time A Week (%)**	**Missing (%)**	**Less Than 1 Time A Week (%)**	**More Than 1 Time A Week (%)**	**Missing (%)**
Alcohol Use (recall period)	315 (55.4)	44 (7.7)	210 (36.9)	327 (57.5)	62 (10.9)	180 (31.6)

	3 Month Follow-Up			9 Month Follow-Up		
Self-Report Post-Treatment Drug Use Variables	**Did Not Use Illegal Drug (%)**	**Did Use Illegal Drug (%)**	**Missing (%)**	**Did Not Use Illegal Drug (%)**	**Did Use Illegal Drug (%)**	**Missing (%)**
Marijuana Use (recall period)	324 (56.9)	37 (6.5)	208 (36.6)	317 (55.7)	74 (13.0)	178 (31.3)
Crack Use (recall period)	342 (60.1)	19 (3.3)	208 (36.6)	357 (62.7)	34 (6.0)	178 (31.3)
Cocaine Use (recall period)	336 (59.1)	24 (4.2)	209 (36.7)	362 (63.6)	28 (4.9)	179 (31.5)
Heroin Use (recall period)	338 (59.4)	22 (3.9)	209 (36.7)	358 (62.9)	32 (5.6)	179 (31.5)

	3 Month Follow-Up			9 Month Follow-Up		
Combined Post-Treatment Substance Use Variable	**Never Used Illegal Drugs**	**Used Illegal Drugs At Least Once**	**Missing (%)**	**Never Used Illegal Drugs**	**Used Illegal Drugs At Least Once**	**Missing (%)**
Has Parolee Used Any Illegal Drugs in the Recall Period	275 (48.3)	84 (14.8)	210 (36.9)	269 (47.3)	120 (21.1)	180 (31.6)

This section will be describing the rates of post-treatment substance use among parolees involved in the Step'n Out study. Table 5.04 highlights the percentage of parolees that did not self-report engaging in post-treatment substance use, did self-report engaging in post-treatment substance use at least one time, and the percentage of parolees with missing data. The substances that were analyzed included alcohol, marijuana, crack, cocaine, heroin, and combined drug use at both the 3 and 9 month follow-up periods.

Sung et al. (2010) discusses how there is a significant gap in addressing the drug treatment needs among parolees and that this gap is proving to be costly for individuals, families, and communities. Specifically, Sung et al. (2010) discusses how if this gap continues to remain unaddressed at both the individual and systemic levels, these issues will continue to contribute to the exponential growth in the incarceration rate as a result of parole revocations due to substance use. The substantial percent increases in substance use observed between the 3 and 9 month follow-up periods for parolees participating in the Step'n Out study suggests that a large percentage of the parolees being analyzed will experience parole violations and revocations that will ultimately result in a return to incarceration.

Table 5.04 illustrates the descriptive statistics for post-treatment substance use among parolees participating in the Step'n Out study at both the 3 and 9 month follow-up periods. It was observed that at the 3 month follow-up 12.2% (44 out of 359) of all parolees with available data engaged in alcohol use more than 1 time a week and at the 9 month follow-up 15.9% (62 out of 389) of all parolees with available data engaged in alcohol use more than 1 time a week. There was a 41% increase in the number of parolees self-reporting using alcohol more than 1 time a week between the 3 month follow-up and 9 month follow-up. Next marijuana use will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.04, it was observed that at the 3 month follow-up 10.2% (37 out of 361) of all parolees with available data engaged in marijuana use at least one time and at the 9 month follow-up 18.9% (74 out of 391) of all parolees with available data engaged in marijuana use at least one time. There was a 100% increase in the number of parolees self-reporting using marijuana at least one time between the 3 month follow-up and 9 month follow-up. Next crack use will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.04, it was observed that at the 3 month follow-up 5.2% (19 out of 361) of all parolees with available data engaged in crack use at least one time and at the 9 month follow-up 8.6% (34 out of 391) of all parolees with available data engaged in crack use at least one time. There was a 79% increase in the number of parolees self-reporting using crack at least one time between the 3 month follow-up and 9 month follow-up. Next cocaine use will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.04, it was observed that at the 3 month follow-up 6.6% (24 out of 360) of all parolees with available data engaged in cocaine use at least one time and at the 9 month follow-up 7.1% (28 out of 390) of all parolees with available data engaged in cocaine use at least one time. There was a 17% increase in the number of parolees self-reporting cocaine use at least one time between the 3 month follow-up and 9 month follow-up. Next heroin use will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.04, it was observed that at the 3 month follow-up 6.1% (22 out of 360) of all parolees with available data engaged in heroin use at least one time and at the 9 month follow-up 8.2% (32 out of 390) of all parolees with available data engaged in heroin use at least one time. There was a 45% increase in the number of parolees self-reporting heroin use at least one time

between the 3 month follow-up and 9 month follow-up. Next the combined post-treatment substance use data will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.04, it was observed that at the 3 month follow-up 23.3% (84 out of 359) of all parolees with available data engaged in post-treatment substance use at least one time and at the 9 month follow-up 30.8% (120 out of 389) of all parolees with available data engaged in post-treatment substance use at least one time. There was a 43% increase in the number of parolees self-reporting post-treatment substance use at least one time between the 3 month follow-up and 9 month follow-up.

The univariate statistics results for post-treatment substance use data indicates that there was substantial percentage increases in alcohol and drug use between the 3 month and 9 month follow-up periods, amongst parolees, involved in the Step'n Out study. Sung et al. (2010) reports that recently released inmates compared to the general population are nearly 13 times likelier to die during their first 2 weeks in the community as a result of drug overdose. Similarly, the participants involved in the Step'n Out study are demonstrating a markedly elevated relative risk of premature mortality due to their prevalence of engaging in post-treatment substance use. Sung et al. (2010) also reports that drug dependent and abusing inmates also have increased high-risk characteristics that are negatively correlated with successful reintegration into the community. The high-risk characteristics reported by Sung et al. (2010) include experiences of physical or sexual abuse, homelessness, unemployment, parental substance abuse, and parental incarceration (p. 42).

Post-Treatment Recidivism 3 and 9 Month Follow-Up Data.

Table 5.05. Descriptive Statistics for Post-Treatment Recidivism Data Measured at the 3 and 9 Month Follow-up Periods

	3 Month Follow-Up			**9 Month Follow-Up**		
Self-Report Post-Treatment Recidivism Variables related to Substance Use	**Did Not Perform Illegal Act N(%)**	**Performed Illegal Act N(%)**	**Missing N(%)**	**Did Not Perform Illegal Act N(%)**	**Performed Illegal Act N(%)**	**Missing N(%)**
# Times Committed Public Intoxication (recall period)	308 (54.1)	52 (9.1)	209 (36.7)	320 (56.2)	70 (12.3)	179 (31.5)
# Times Committed DWI (recall period)	352 (61.9)	8 (1.4)	209 (36.7)	360 (63.3)	30 (5.3)	179 (31.5)
# Times Committed Illegal Drugs (recall period)	271 (47.6)	89 (15.6)	209 (36.7)	271 (47.6)	118 (20.7)	180 (31.6)
# Times Committed Drug Sale (recall period)	346 (60.8)	14 (2.5)	209 (36.7)	369 (64.9)	21 (3.7)	179 (31.5)

	3 Month Follow-Up			**9 Month Follow-Up**		
Self-Report Post-Treatment Recidivism Variables Related to Corrections and Criminal Activity	**Event Did Not Occur N(%)**	**Event Occurred N(%)**	**Missing N(%)**	**Event Did Not Occur N(%)**	**Event Occurred N(%)**	**Missing N(%)**
# Nights in Jail (recall period)	283 (49.7)	76 (13.4)	210 (36.9)	257 (45.2)	121 (21.3)	191 (33.6)
Total days incarcerated (recall period)	286 (50.3)	74 (13.0)	209 (36.7)	232 (40.8)	158 (27.8)	179 (31.5)
# Times Committed Probation/Parole Violation (recall period)	289 (50.8)	71 (12.5)	209 (36.7)	295 (51.8)	95 (16.7)	179 (31.5)
Physically/Verbally Threatened Someone (recall period)	331 (58.2)	29 (5.1)	209 (36.7)	345 (60.6)	44 (7.7)	180 (31.6)

	3 Month Follow-Up			**9 Month Follow-Up**		
Combined Post-Treatment Recidivism Variable	**Never Recidivated N(%)**	**Recidivated At Least Once N(%)**	**Missing N(%)**	**Never Recidivated N(%)**	**Recidivated At Least Once N(%)**	**Missing N(%)**
Has Parolee Recidivated in the Recall Period	208 (36.6)	147 (25.8)	214 (37.6)	139 (24.4)	236 (41.5)	194 (34.1)

This section will be describing the rates of post-treatment recidivism among parolees involved in the Step'n Out study. Table 5.05 highlights the percentage of parolees that did not self-report engaging in post-treatment recidivism, self-reported engaging in post-treatment recidivism at least one time, and the percentage of parolees with missing data. The recidivism outcomes that were analyzed included committing public intoxication, DWI, illegal drug use, illegal drug sales, jail time, incarceration time, committing probation/parole violations, physically/verbally threatening someone, and a combined post-treatment recidivism variable at both the 3 and 9 month follow-up periods.

Sung and Belenko (2005) report that parolees receiving long-term, high dosage, intensive care treatment interventions remain high at-risk for returning to criminal lifestyles, with previous research reporting 48% of graduates from diversion programs recidivating within one to three years after program completion (p. 77). Sung and Belenko (2005) state that rates of recidivism are not accidental and are highly correlated with young age, criminal history, marital status, and employment status (p. 78). Similarly, parolees participating in the Step'n Out study demonstrate high levels of relative-risk for returning to criminal lifestyles post-treatment. Gottfredson and Hirschi (1990) theorize that propensity for engaging in recidivism can be theoretically linked to levels of self-control. However, further analysis of contextual causal factors is also needed to explain post-treatment recidivism outcomes, such as, negative credentialing of felons, which can severely limit earning potentials for those individuals with a history of incarceration (Pager, 2004; Sung & Richter, 2006).

Table 5.05 illustrates the descriptive statistics for post-treatment recidivism among parolees participating in the Step'n Out study at both the 3 and 9 month follow-up periods. It was observed that at the 3 month follow-up 14.4% (52 out of 360) of all parolees with available data

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were publicly intoxicated at least one time and at the 9 month follow-up 17.9% (70 out of 390) of all parolees with available data were publicly intoxicated at least one time. There was a 35% increase in the number of parolees self-reporting were publicly intoxicated at least one time between the 3 month follow-up and 9 month follow-up. Next the post-treatment driving while intoxicated (DWI) outcomes will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 2.2% (8 out of 360) of all parolees with available data committed DWI at least one time and at the 9 month follow-up 7.6% (30 out of 390) of all parolees with available data committed DWI at least one time. There was a 275% increase in the number of parolees that self-reported committing DWI at least one time between the 3 month follow-up and 9 month follow-up. Next post-treatment illegal drug use will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 24.7% (89 out of 360) of all parolees with available data committed illegal drug use at least one time and at the 9 month follow-up 30.3% (118 out of 389) of all parolees with available data committed illegal drug use at least one time. There was a 33% increase in the number of parolees that self-reported committing illegal drug use at least one time between the 3 month follow-up and 9 month follow-up. Next post-treatment drug sales will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 3.8% (14 out of 360) of all parolees with available data committed illegal drug sales at least one time and at the 9 month follow-up 5.3% (21 out of 390) of all parolees with available data committed illegal drug sales at least one time. There was a 50% increase in the number of parolees that self-reported committing illegal drug sales at least one time between the 3 month follow-up and 9 month follow-up. Next

post-treatment number of nights in jail will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 21.1% (76 out of 360) of all parolees with available data spent a night in jail at least one time and at the 9 month follow-up 33.5% (121 out of 390) of all parolees with available data spent a night in jail at least one time. There was a 59% increase in the number of parolees that self-reported spending a night in jail at least one time between the 3 month follow-up and 9 month follow-up. Next post-treatment number of days incarcerated will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 20.6% (74 out of 359) of all parolees with available data had been incarcerated at least one time and at the 9 month follow-up 41.7% (158 out of 378) of all parolees with available data had been incarcerated at least one time. There was a 113% increase in the number of parolees that self-reported being incarcerated at least one time between the 3 month follow-up and 9 month follow-up. Next post-treatment number times violated probation/parole will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 19.7% (71 out of 360) of all parolees with available data had committed a probation/parole violation at least one time and at the 9 month follow-up 24.3% (95 out of 390) of all parolees with available data had committed a probation/parole violation at least one time. There was a 34% increase in the number of parolees that self-reported committing a probation/parole violation at least one time between the 3 month follow-up and 9 month follow-up. Next post-treatment number of times physically/verbally threatened someone will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 8.0% (29 out of 360) of all parolees with available data had physically/verbally threatened someone at least one time and at the 9 month follow-up 11.3% (44 out of 389) of all parolees with available data had physically/verbally threatened someone at least one time. There was a 52% increase in the number of parolees that self-reported physically/verbally threatening someone at least one time between the 3 month follow-up and 9 month follow-up. Next the post-treatment combined recidivism variable will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.05, it was observed that at the 3 month follow-up 41.4% (147 out of 355) of all parolees with available data had committed recidivism at least one time and at the 9 month follow-up 62.9% (236 out of 375) of all parolees with available data had committed recidivism at least one time. There was a 61% increase in the number of parolees that self-reported committing recidivism at least one time between the 3 month follow-up and 9 month follow-up.

These findings, particularly, the combined recidivism variable, highlights the high levels of risk for re-incarceration faced by the parolees participating in the Step'n Out study. The rates of self-reported engagement in recidivism supports Sung and Belenko's (2005) position that even intensive treatment interventions cannot reduce the long-term probability of post-treatment recidivism, unless, there exists "highly intensive aftercare that focuses on rule compliance, employment readiness and job placement, and family skills training, in order to improve the level of self-control, employability, and family functioning of high-risk treatment completers (p. 93)." However, it remains disputable whether a treatment intervention such as the present one being studied, the Collaborative Behavioral Management intervention, can moderate the relationship between self-control and post-treatment recidivism outcomes. Sung and Belenko (2005) note that

the presence of personality disorders substantially increases risk levels and decreases the ability

for parolees to avoid engaging in recidivism, particularly if the parolee is substance abusing.

Post-Treatment Analogous Behaviors 3 and 9 Month Follow-Up Data.

Table 5.06. Descriptive Statistics for Post-Treatment Analogous Behavior Data Measured at the 3 and 9 Month Follow-up Period

Post-Treatment Analogous Behaviors	3 Month Follow-Up			9 Month Follow-Up		
	Event Did Not Occur (%)	Event Occurred (%)	Missing (%)	Event Did Not Occur (%)	Event Occurred (%)	Missing (%)
# Times Had Sex w/out Condom w/Casual Partner Past 30 Days	183 (32.2)	32 (5.6)	354 (62.2)	203 (35.7)	32 (5.6)	334 (41.3)
# Times Had Sex w/out Condom w/Someone Who Smokes Crack/Cocaine Past 30 Days	206 (36.2)	9 (1.6)	354 (62.2)	225 (39.5)	8 (1.4)	336 (59.1)
	3 Month Follow-Up			**9 Month Follow-Up**		
	One or Less People (%)	Two or More People (%)	Missing (%)	One or Less People (%)	Two or More People (%)	Missing (%)
# People Had Sex With Past 30 Days	296 (52.0)	61 (10.7)	212 (37.3)	346 (60.8)	42 (7.4)	181 (31.8)
Combined Post-Treatment Analogous Behavior Variable	**3 Month Follow-Up**			**9 Month Follow-Up**		
	Never Engaged in Analogous Behaviors N(%)	Engaged in Analogous Behaviors At Least Once N(%)	Missing N(%)	Never Engaged in Analogous Behaviors N(%)	Engaged in Analogous Behaviors At Least Once N(%)	Missing N(%)
Has Parolee Engaged in Analogous Behaviors in the Recall Period	177 (31.1)	38 (6.7)	354 (62.2)	197 (34.6)	35 (6.2)	337 (59.2)

This section will be describing the rates of post-treatment analogous behaviors among parolees involved in the Step'n Out study. Table 5.06 highlights the percentage of parolees that did not self-report engaging in post-treatment analogous behaviors, self-reported engaging in post-treatment analogous behaviors at least one time, and the percentage of parolees with missing data. The analogous behavior outcomes that were analyzed included number of times parolee had sex without a condom, number of times parolee had sex without a condom with someone who smokes crack/cocaine, and number of people parolee had sex with, and a combined post-treatment analogous behavior variable at both the 3 and 9 month follow-up periods.

Table 5.06 illustrates the descriptive statistics for post-treatment analogous behaviors among parolees participating in the Step'n Out study at both the 3 and 9 month follow-up periods. It was observed that at the 3 month follow-up 14.8% (32 out of 215) of all parolees with available data were had sex without a condom with a casual partner at least one time and at the 9 month follow-up 13.6% (32 out of 235) of all parolees with available data had sex without a condom with a casual partner at least one time. There was a 0.0% increase in the number of parolees that self-reported having sex without a condom with a casual partner at least one time between the 3 month follow-up and 9 month follow-up. Next the post-treatment outcome of the number of parolees that had sex without a condom with someone who smokes crack/cocaine will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.06, it was observed that at the 3 month follow-up 4.1% (9 out of 215) of all parolees with available data had sex without a condom with someone who smokes crack/cocaine at least one time and at the 9 month follow-up 3.4% (8 out of 233) of all parolees with available data had sex without a condom with someone who smokes crack/cocaine at least one time. There

was a 11% decrease in the number of parolees that self-reported having sex without a condom with someone who smokes crack/cocaine at least one time between the 3 month follow-up and 9 month follow-up. Next the post-treatment outcome of the number of times parolee had sex with two or more partners will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.06, it was observed that at the 3 month follow-up 17.0% (61 out of 357) of all parolees with available data had sex with two or more partners and at the 9 month follow-up 10.8% (42 out of 388) of all parolees with available data had sex with two or more partners. There was a 31% decrease in the number of parolees that self-reported having sex with two or more partners between the 3 month follow-up and 9 month follow-up. Next the post-treatment combined analogous behaviors variables will be analyzed at both the 3 and 9 month follow-up periods.

In table 5.06, it was observed that at the 3 month follow-up 17.6% (38 out of 215) of all parolees with available data engaged in analogous behavior at least one time and at the 9 month follow-up 15.0% (35 out of 232) of all parolees with available data engaged in analogous behavior at least one time. There was an 8% decrease in the number of parolees that engaged in analogous behavior at least one time between the 3 month follow-up and 9 month follow-up.

Post-Treatment Total Deviant Behaviors 3 and 9 Month Follow-Up Data.

Table 5.07. Descriptive Statistics for Post-Treatment Deviant Behavior Data Measured at the 3 and 9 Month Follow-up Period

Combined Post-Treatment Total Deviant Behaviors	3 Month Follow-Up			9 Month Follow-Up		
	Never Engaged in Deviant Behaviors N(%)	Engaged in Deviant Behaviors At Least Once N(%)	Missing N(%)	Never Engaged in Deviant Behaviors N(%)	Engaged in Deviant Behaviors At Least Once N(%)	Missing N(%)
Has Parolee engaged in deviant behaviors in the recall period	116 (20.4)	93(16.3)	360(63.3)	84 (14.8)	134 (23.6)	351 (6.7)

This section will be describing the total number of people that self-reported engaging in at least one of the following post-treatment outcomes: substance use, recidivism, and analogous behaviors at the 3 and 9 month follow-up periods. As discussed and operationalized in the methodology chapter, deviant behaviors are defined as any sort of behavior that violates social norms and criminal laws in a particular society (Akers, 1997). A closer examination of table 5.07 descriptive statistics on deviance among parolees participating in the Step'n Out study reveals that 44% (93 out of 209) of parolees self-reported engaging in deviance at least once at the 3 month follow-up and 61% (134 out of 218) of parolees self-reported engaging in deviance at least once at the 9 month follow-up. There was a 44.1% increase in the number of parolees self-reporting engaging in deviance between the 3 and 9 month follow-up periods. These findings suggest that post-treatment deviant behavior is common among a large majority of the parolees participating in the Step'n Out study.

However, it is not clear which, if any, theoretically specified mechanisms are driving deviant behavior and if rehabilitation and surveillance practices (e.g. Collaborative Behavioral Management intervention) alone are capable of decreasing relative risk for deviant behavior. Gottfredson and Hirschi (1990) state that low self-control theory is a general theory of crime and hypothesize that low self-control is the primary theoretical construct for explaining deviant behavior. The next section will test the hypotheses of Gottfredson and Hirschi (1990) through a series of bivariate analyses that look specifically at the relationship between low self-control and post-treatment outcomes.

II. *Bivariate Analysis Results.*

The bivariate analysis results section provides a comprehensive series of results for the Independent Sample *t*-tests and Pearson's r correlation tests that were conducted. As discussed in the methods section in chapter 4, the independent variable, low self-control factor score[2] is hypothesized to effect rates of exposure to various dependent variables related to post-treatment outcomes. Based on the previous literature discussed in chapters 2 and 3, it is hypothesized that parolees with higher low self-control factor scores (higher scores equal lower levels of self-control) will be engaging in post-treatment substance use, recidivism, analogous behaviors, and total deviant behaviors compared to parolees who did not self-report engaging in those behaviors (Gottfredson and Hirschi, 1990).

The null hypothesis for the series of Independent Samples *t*-tests is that the low self-control factor score is not statistically significantly different for parolees that self-reported engaging in various forms of post-treatment outcomes versus those parolees who did not self-report engaging in those post-treatment outcomes. The alternative hypothesis for the series of

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[2] On an ancillary note, a series of independent sample t-tests were conducted using low self-control additive scores for comparing post-treatment outcomes among parolees and the results were identical to the findings reported in the present dissertation study.

independent sample *t*-tests is that parolees who engaged in various forms of post-treatment substance use, recidivism, and analogous behaviors will have statistically significantly higher low self-control levels (higher low self-control factor score equals low self-control) compared to parolees who did not self-report engaging in those post-treatment outcomes.

The findings from the Independent Samples *t*-tests that are listed ahead and suggest that parolees participating in the Step'n Out study who engaged in various forms of post-treatment outcomes did not have statistically significantly different means and distributions on the low self-control factor score when compared to parolees who did not self-report engaging in post-treatment outcomes. The bivariate graphs in this chapter, illustrate that parolees from across the self-control distribution were engaging in post-treatment substance use, recidivism, and analogous behaviors. The overall majority of findings from the bivariate analysis section run contrary to the theoretical predictions outlined by Gottfredson and Hirschi (1990). The findings from this study and the possible contextual factors for explaining post-treatment outcomes will be further discussed in chapter 7.

Although, low self-control did not consistently predict a majority of the post-treatment outcomes, a really interesting finding from this dissertation is that the Independent Sample *t*-test does reveal that there are statistically significant differences in levels of low self-control between parolees who physically/verbally threatened someone versus those who did not at both 3 and 9 month follow-up periods. This is a particularly important finding, because it is possible that low self-control traits may be indicative of possible violent or threatening behavior post-treatment. Similarly, Grasmick et al. (1993) found that their version of the low self-control factor score interacting with criminal opportunity significantly predicts criminally forceful or violent

behavior, but low self-control as a main-effect was not statistically significantly predictive of forceful or violent behavior (p. 23).

Another, interesting finding from the bivariate analysis section of this dissertation is that when analyzing the combined post-treatment recidivism dependent variable using the independent sample *t*-test, it is revealed that parolees who self-reported engaging in any recidivism had higher low self-control factor scores (higher score equals lower levels of self-control) versus parolees who did not self-report engaging in any recidivism at both the 3 and 9 month follow-up periods. The theoretical and policy implications of these findings from the independent samples *t*-tests are further discussed in chapter 7.

A major finding from the bivariate analysis section using the independent samples *t*-test analysis reveals that there were statistically significant differences in the self-control mean scores between parolees who self-reported engaging in any deviant behavior versus parolees that self-reported never engaging in deviant behavior at the 9 month follow-up period. The total deviant behavior measure is the combined product of measures of post-treatment substance use, recidivism, and analogous behaviors. Therefore, parolees with higher low self-control scores (higher score equals lower self-control) were found to be engaging in at least one type of deviance at the 9 month follow-up compared to parolees with high self-control. This finding illustrates that low self-control theory has the potential to distinguish the behavior of low versus high self-control offenders in terms of total deviance, but fails to distinguish self-control levels among parolees for the disaggregated post-treatment categories such as substance use, recidivism, and analogous behaviors.

Finally, using independent sample *t*-tests, low self-control factor scores were compared between parolees who had missing post-treatment outcome data versus parolees who had

available post-treatment outcome data. Based on the previous literature, it was hypothesized that parolees with missing post-treatment outcome data have higher low self-control factor scores (higher scores equal lower levels of self-control) compared to parolees with available post-treatment outcome data (Gottfredson and Hirschi, 1990). However, this dissertation study found that low self-control factor score means were not statistically significantly different across a subset of post-treatment outcome data that was analyzed for this study. Therefore, we can conclude that parolees with missing data were not significantly different than parolees with available data in terms of their levels of self-control. Something other than levels of self-control were driving rates of responses for completing the 3 and 9 month follow-up interviews that included measures of post-treatment outcomes. Possible features of the experimental design and contextual factors for why parolees were missing data at both the 3 and 9 month follow-up periods will be explained and discussed in chapter 7.

I. Independent Sample t-tests of Control Variables

Table 5.08. Independent sample t-test results summary for treatment condition, demographic, and risk-factor variables when comparing mean self-control factor scores

n	Mean	n	Mean	p
Control Group		Treatment Group		
281	0.058	288	-0.057	0.171
Male		Female		
478	0.008	91	-0.041	0.670
White		Non-White		
199	-0.135	370	0.726	0.018
Arrested before the age of 19 years old		Arrested after the age of 19 years old		
418	0.095	151	-0.262	< 0.001
Never divorced/single		Divorced one or more times		
411	0.081	158	-0.21	0.002
No did not drop out of school		Yes dropped out of school		
189	-0.224	380	0.111	< 0.001

Independent Sample t-tests were conducted to examine the mean differences in the low self-control factor score between the treatment conditions, demographic characteristics, and risk-factors. The Independent Sample t-tests that are reported in this section includes all of the results that were found to be either moderately significant at the 0.10 alpha level or statistically significant at the 0.05 alpha level. An Independent samples t-test was conducted to compare the mean low self-control factor score between the race of parolees, which was recoded into white and non-white racial categories. There was a statistically significant difference in the low self-control factor scores for the white (M=-0.135, SD=0.934) and non-white (M=-0.726, SD=1.028) categories; t(567) = -2.371, p < 0.05. The results above (Table 5.08) suggest that racial categorization is related to the low self-control factor score mean. Specifically, it is revealed that whites have lower low self-control scores (lower factor score equals higher self-control and vice versa) compared to non-whites. Below, figure 5.01 presents the distribution of the low self-control factor score dependent variable for both whites and non-whites.

Figure 5.01. Distribution of the low self-control factor score dependent variable for comparing white and non-white races.
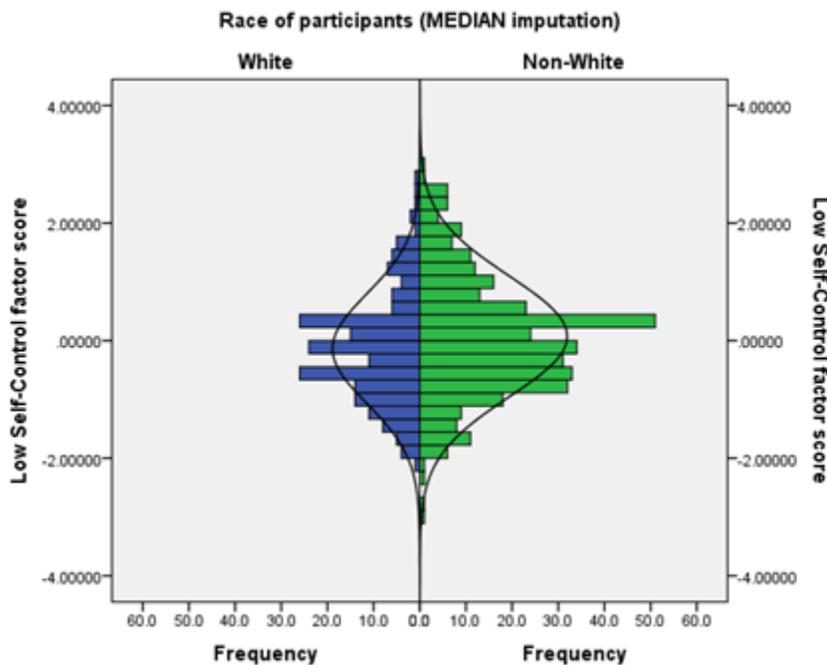
An Independent samples t-test was conducted to compare the mean low self-control factor score between the age of first arrest for parolees, which was recoded into less than 19 years old and greater than or equal to 19 years old categories. There was a statistically significant difference in the low self-control factor scores for the less than 19 years old (M=0.095, SD=1.000) and greater than or equal to 19 years old (M=-0.262, SD=0.956) categories; $t(567) = 3.797$, $p < 0.001$. The results above (Table 5.08) suggest that age at first arrest categorization is related to the low self-control factor score mean. Specifically, it is revealed that parolees who were arrested below the age of 19 had a higher low self-control factor score (higher low self-control factor score equals lower levels of self-control) compared to individuals arrested at 19 years or above. Below, figure 5.02 presents the distribution of the low self-control factor score dependent variable for parolees first arrested before or after the age of 19 years old.

Figure 5.02. Distribution of the low self-control factor score dependent variable for comparing age at first arrest categorization.
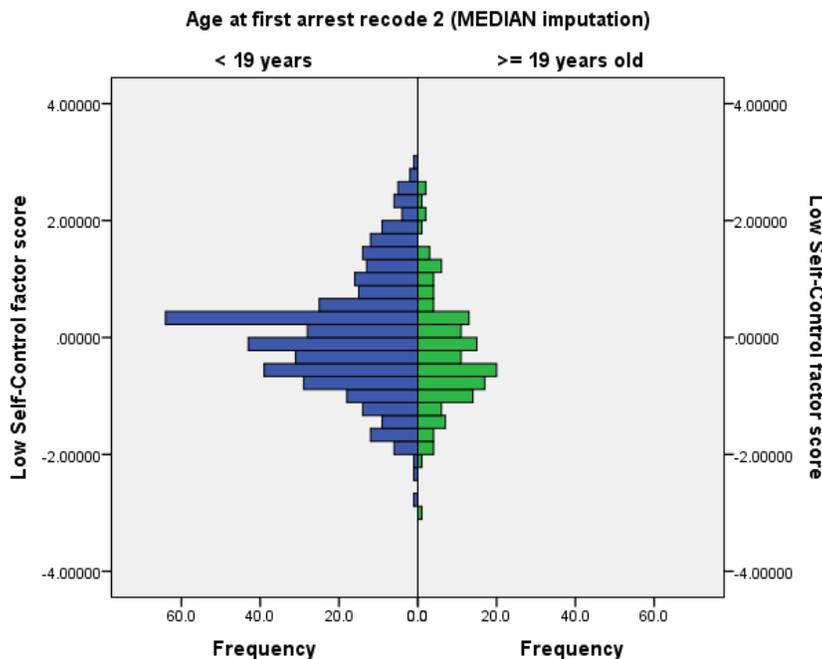
An Independent Samples t-test was conducted to compare the mean low self-control factor score between the relationship status for parolees, which was recoded into never divorced/single and divorced one or more times categories. There was a statistically significant difference in the low self-control factor scores for the never divorced/single (M=0.081, SD=0.957) and divorced one or more times (M=-0.21, SD=1.08) categories; t(567) = 3.31, p < 0.05. The results above (Table 5.08) suggest that relationship status categorization is related to the low self-control factor score mean. Specifically, it is revealed that parolees who were never divorced/single had a higher low self-control factor score (higher low self-control factor score equals lower levels of self-control) compared to individuals who were divorced one or more times. Below, figure 5.03 presents the distribution of the low self-control factor score dependent variable for parolees never divorced/single or divorced one or more times.

Figure 5.03. Distribution of the low self-control factor score dependent variable for comparing relationship status categorization.
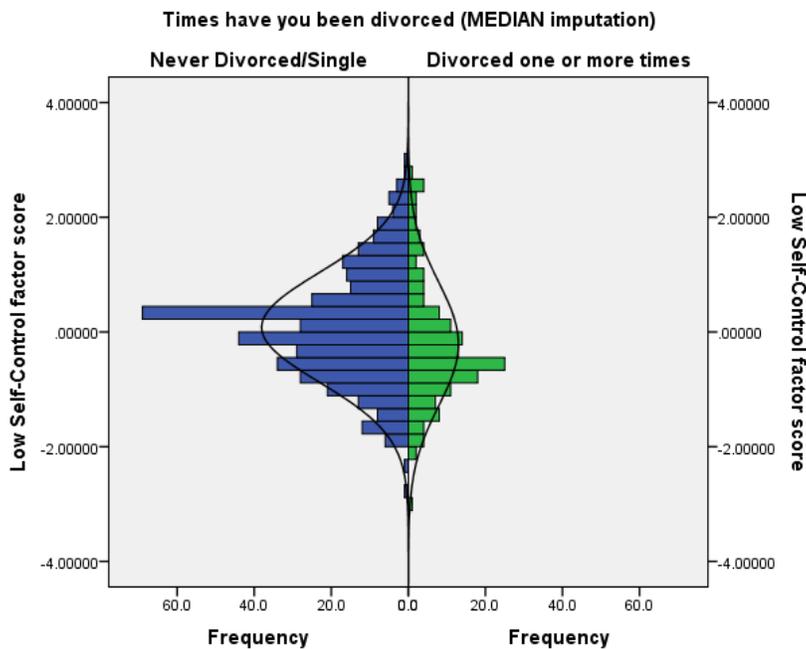
An Independent samples t-test was conducted to compare the mean low self-control factor score between the school completion status for parolees, which was recoded into did not drop out of school and yes dropped out of school. There was a statistically significant difference in the low self-control factor scores for the dropped out of school (M=-0.224, SD=0.948) and did not drop out of school (M=-0.111, SD=1.001) categories; $t(567) = -3.815$, $p < 0.001$. The results above (Table 5.08) suggest that school completion status categorization is related to the low self-control factor score mean. Specifically, it is revealed that parolees who dropped out of school had a higher low self-control factor score (higher low self-control factor score equals lower levels of self-control) compared to individuals who did not drop out of school. Below, figure 5.04 presents the distribution of the low self-control factor score dependent variable for parolees who stayed in school or dropped out of school.

Figure 5.04. Distribution of the low self-control factor score dependent variable for comparing school completion status categorization.
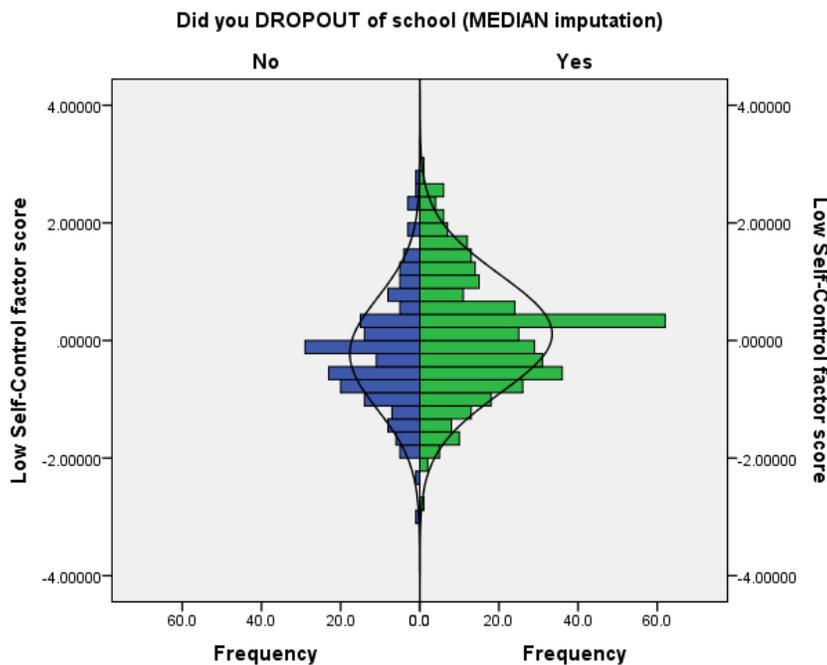
II. Independent Sample t-tests of Post-Treatment Substance Use

Table 5.09. Independent sample t-test results summary for substance use measured at the 3 and 9 month follow-ups when comparing self-control factor scores

|	n	Mean	n	Mean	p
	Less than 1 time a week		More than 1 time a week		
Alcohol Use (3 months)	315	-0.348	44	0.267	0.89
Alcohol Use (9 months)	327	0.005	62	0.001	0.979
	Never engaged in activity		Engaged in activity at least once		
Marijuana (3 months)	324	-0.007	37	0.071	0.739
Marijuana (9 months)	317	-0.013	74	0.081	0.495
Crack (3 months)	342	0.0178	19	-0.306	0.212
Crack (9 months)	357	-0.002	34	0.059	0.759
Cocaine (3 months)	336	0.022	24	-0.0275	0.201
Cocaine (9 months)	362	0.024	28	-0.289	0.135
Heroin (3 months)	338	-0.004	22	0.095	0.683
Heroin (9 months)	358	0.26	32	-0.206	0.24

Independent samples t-tests were conducted to examine the mean differences in the low self-control factor score between the levels of engagement in various forms of illegal and legal substance use. The t-tests revealed that that there were no moderately significant (0.10 alpha level) or statistically significant (0.05 alpha level) differences in the various levels of engagements in drug use at both the 3 and 9 month follow-up periods when comparing low self-control factor score means. Therefore, we can conclude that engagement in substance use is not related to the low self-control factor score for parolees.

III. Independent Sample t-tests of Post-Treatment Recidivism

Table 5.10. Independent sample t-test results summary for recidivism measured at the 3 and 9 month follow-ups when comparing mean self-control factor scores

	n	Mean	n	Mean	p
	Never engaged in activity		Engaged in activity at least once		
Jail days (3 months)	283	-0.019	76	0.089	0.45
Jail days (9 months)	257	-0.016	121	0.066	0.49
Public intoxication (3 months)	308	-0.026	52	0.182	0.207
Public intoxication (9 months)	320	0.0137	70	-0.058	0.574
DWI (3 months)	352	0.002	8	0.088	0.827
DWI (9 months)	360	0.000	30	0.004	0.986
Illegal drug use (3 months)	271	0.037	89	-0.096	0.323
Illegal drug use (9 months)	271	0.024	118	-0.051	0.493
Illegal drug sale (3 months)	346	-0.005	14	0.207	0.48
Illegal drug sales (9 months)	369	0.001	21	-0.0111	0.958
Probation/parole violation (3 months)	289	-0.031	71	0.146	0.222
Probation/parole violation (9 months)	295	0.013	95	-0.037	0.695
Incarceration (3 months)	286	-0.049	74	0.199	0.083
Incarceration (9 months)	232	-0.055	158	0.082	0.213
Physically/verbally threatened someone (3 months)	331	-0.0641	29	0.758	< 0.001
Physically/verbally threatened someone (9 months)	345	-0.037	44	0.37	0.017

Independent samples t-tests were conducted to examine the mean differences in the low self-control factor score between the levels of engagement in various forms of offending behavior related to recidivism. The t-tests revealed that that for a majority of the variables analyzed there were no moderately significant (0.10 alpha level) or statistically significant (0.05 alpha level) differences in the various levels of engagement in offending behaviors related to recidivism at both the 3 and 9 month follow-up periods when comparing the low self-control factor score means. Therefore, we can generally conclude that engagement in recidivism is not related to the low self-control factor score for parolees.

However, an independent samples t-test was conducted to compare the mean low self-control factor score between the number of times parolees physically/verbally threatened

someone at the 3 month follow-up, which was recoded into no did not physically/verbally

threaten someone and yes did physically/verbally threaten someone. There was a statistically

significant difference in the low self-control factor scores for the categories no did not

physically/verbally threaten someone (M=-0.0641, SD=1.074) and yes physically/verbally

threatened someone (M=0.758, SD=1.126); t(358) = -3.939, p < 0.001. The results above (Table

5.10) suggest that physically/verbally threatening someone categorization is related to the low

self-control factor score mean. Specifically, parolees who reported physically/verbally

threatening someone have a significantly higher low self-control factor score (higher low self-

control factor score equals lower levels of self-control and vice versa) compared to parolees who

did not physically/verbally threaten someone. Below, figure 5.05 presents the distribution of the

low self-control factor score dependent variable for parolees who did or did not

physically/verbally threaten someone at the 3 month follow-up.

Figure 5.05. Distribution of the low self-control factor score dependent variable for comparing
the number of times parolees physically/verbally threatened someone at the 3 month follow-up.
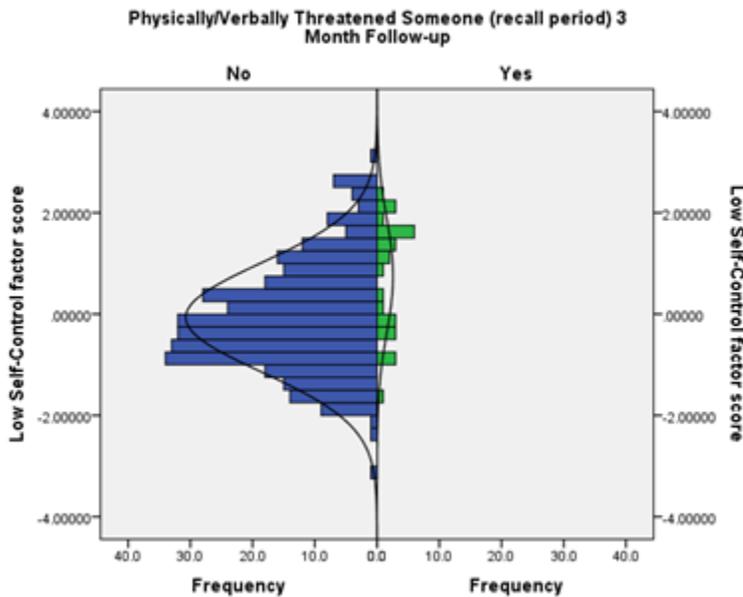
Also an independent samples t-test was conducted to compare the mean low self-control factor score between the number of times parolees physically/verbally threatened someone at the 9 month follow-up, which was recoded into no did not physically/verbally threaten someone and yes did physically/verbally threaten someone. There was a statistically significant difference in the low self-control factor scores for the categories no did not physically/verbally threaten someone (M=-0.037, SD=1.058) and yes physically/verbally threatened someone (M=0.37, SD=1.094); $t(387) = -2.393$, $p < 0.05$. The results above (Table 5.10) suggest that physically/verbally threatening someone categorization is related to the low self-control factor score mean. Specifically, parolees who reported physically/verbally threatening someone have a significantly higher low self-control factor score (higher low self-control factor score equals lower levels of self-control and vice versa) compared to parolees who did not physically/verbally threaten someone. Below, figure 5.06 presents the distribution of the low self-control factor score dependent variable for parolees who did or did not physically/verbally threaten someone at the 9 month follow-up.

Figure 5.06. Distribution of the low self-control factor score dependent variable for comparing the number of times parolees physically/verbally threatened someone at the 9 month follow-up.
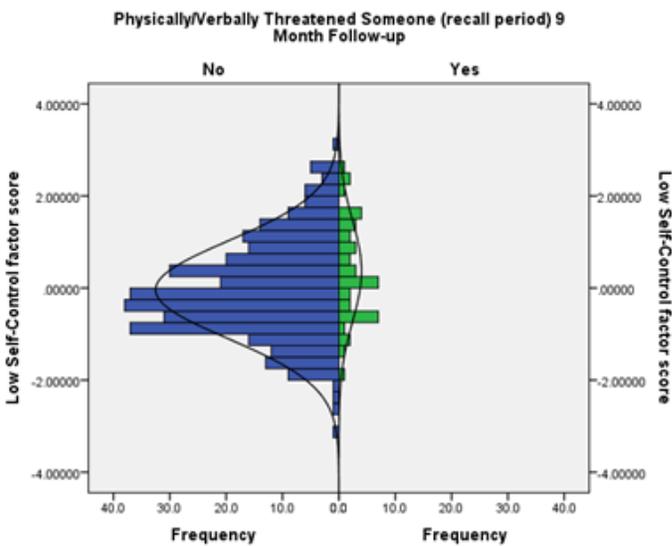
IV. Independent Sample t-tests of Post-Treatment Analogous Behaviors

Table 5.11. Independent sample t-test results summary for analogous behaviors measured at the 3 and 9 month follow-ups when comparing mean self-control factor scores

	n	Mean	n	Mean	p
	One or less		Two or more		
Number of sexual partners (3 months)	296	-0.022	61	0.130	0.326
Number of sexual partners (9 months)	203	0.083	32	-0.188	0.182
	Never engaged in activity		Engaged in activity at least once		
Sex without a condom (3 months)	183	-0.045	32	0.021	0.753
Sex without a condom (9 months)	203	0.083	32	-0.188	0.182
Sex without a condom with someone who smokes crack/cocaine (3 months)	206	-0.012	9	-0.549	0.151
Sex without a condom with someone who smokes crack/cocaine (9 months)	225	0.044	8	0.148	0.787

Independent samples t-tests were conducted to examine the mean differences in the low self-control factor score between the levels of engagement in various forms of analogous behaviors. The Independent Sample t-tests revealed that that for a majority of the variables analyzed there were no moderately significant (0.10 alpha level) or statistically significant (0.05 alpha level) differences in the various levels of engagement in analogous behaviors at both the 3 and 9 month follow-up periods when comparing the low self-control factor score means. Therefore, we can conclude that engagement in substance use is not related to the low self-control factor score for parolees.

V. Independent Sample t-tests of Post-treatment Combined Variables

Table 5.12. t-test results summary for aggregate variables measured at the 3 and 9 month follow-ups when comparing mean self-control factor scores

	n	Mean	n	Mean	p
	Never engaged in activity		Engaged in activity at least once		
Combined illegal drug use (3 months)	275	0.019	84	-0.049	0.621
Combined illegal drug use (9 months)	269	-0.005	120	0.022	0.817
Combined recidivism (3 months)	208	-0.076	147	0.132	0.081
Combined recidivism (9 months)	139	-0.141	236	0.099	0.036
Combined analogous behaviors (3 months)	177	-0.023	38	-0.091	0.730
Combined analogous behaviors (9 months)	197	0.088	35	-0.155	0.217
Total deviance (3 months)	116	-0.069	93	0.416	0.476
Total deviance (9 months)	84	-0.132	134	0.161	0.051

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An Independent samples t-test was conducted to compare the mean low self-control factor score between the number of times parolees had used recidivated at the 3 month follow-up period using a combined variable, which was recoded into never recidivated and recidivated at least once. There is a marginally statistically significant difference in the low self-control factor scores for the categories never recidivated (M=-0.076, SD=1.019) and recidivated at least one time (M=0.132, SD=1.208); t(353) = -1.748, p < 0.10. The results above (Table 5.12) suggest that the number of times parolees recidivated is related to the low self-control factor score mean. Specifically, it was found that parolees who recidivated had a higher low self-control factor score (higher score equals lower self-control and vice versa) compared to parolees who never recidivated. Below, figure 5.07 presents the distribution of the low self-control factor score dependent variable for parolees who did or did not recidivate at the 3 month follow-up.

Figure 5.07. Distribution of the low self-control factor score dependent variable for comparing the number of times parolees recidivated using a combined variable at the 3 month follow-up.
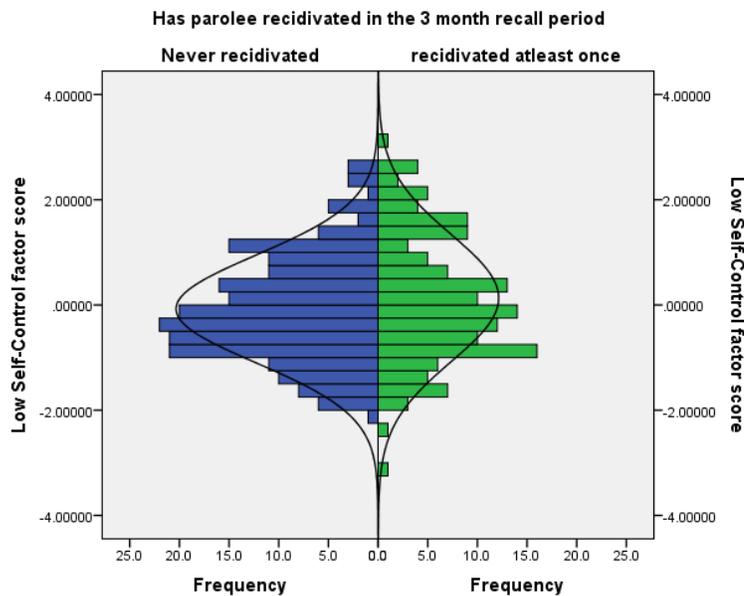
An Independent samples t-test was conducted to compare the mean low self-control factor score between the number of times parolees had recidivated at the 9 month follow-up

using a combined variable, which was recoded into never recidivated and recidivated at least once. There is a statistically significant difference in the low self-control factor scores for the categories never recidivated (M=-0.141, SD=1.096) and recidivated at least one time (M=0.099, SD=1.052); t(373) = -2.102, p < 0.05. The results above (Table 5.12) suggest that the number of times parolees recidivated is related to the low self-control factor score mean. Specifically, it was found that parolees who recidivated at least once had a higher low self-control factor score (higher score equals lower self-control and vice versa) compared to parolees who never recidivated. Below, figure 5.08 presents the distribution of the low self-control factor score dependent variable for parolees who did or did not recidivate at the 9 month follow-up.

Figure 5.08. Distribution of the low self-control factor score dependent variable for comparing the number of times parolees recidivated using a combined variable at the 9 month follow-up.
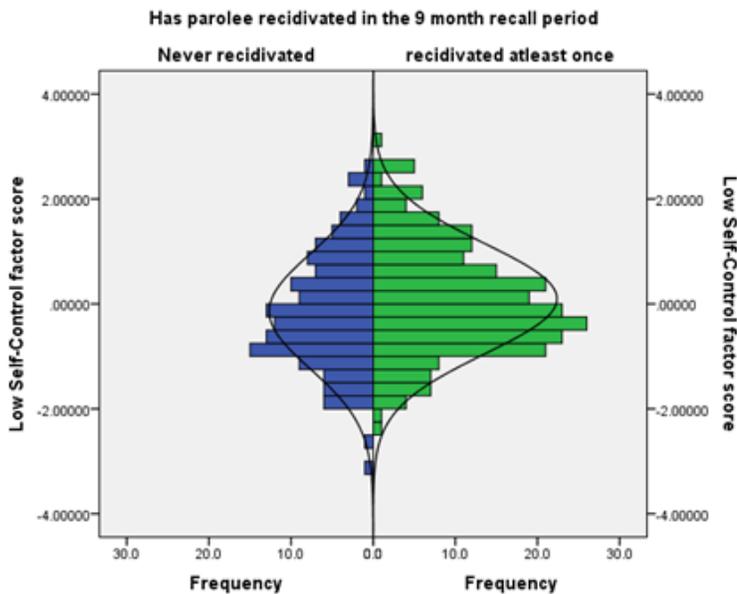
An Independent samples t-test was conducted to compare the mean low self-control factor score between the number of times parolees had engaged in deviant behavior using a combined variable at the 9 month follow-up, which was recoded into never engaged in deviant behaviors and engaged in deviant behaviors at least once. There was a marginally statistically

significant difference in the low self-control factor scores for the categories never engaged in

deviant behaviors (M= -0.132, SD=1.047) and engaged in deviant behaviors at least one time

(M=0.161, SD=1.087); t(216) = -1.966, p < 0.10. The results above (Table 5.12) suggest that

parolees engagement in deviant behaviors is related to the low self-control factor score mean.

Below, figure 5.09 presents the distribution of the low self-control factor score dependent

variable for parolees who did or did not engage in deviant behavior at the 9 month follow-up.

Figure 5.09. Distribution of the low self-control factor score dependent variable for comparing
the number of times parolees engaged in deviant behavior at the 9 month follow-up.
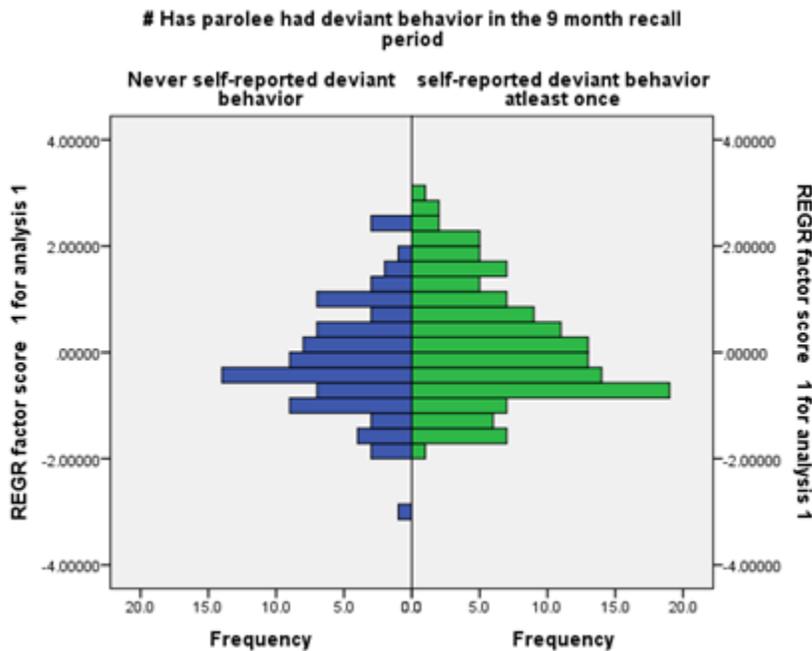
VI. Independent Sample t-tests of Post-Treatment Missing Data

Table 5.13. t-test results summary for missing data measured at the 3 and 9 month follow-ups when comparing mean self-control factor scores

	n	Mean	n	Mean	p
	Data not missing		Data missing		
Crack/cocaine use (3 months)	359	0.004	210	-0.007	0.895
Crack/cocaine use (9 months)	391	0.005	178	-0.011	0.849
Jail days (3 months)	361	0.001	208	-0.001	0.979
Jail days (9 months)	378	0.010	191	-0.194	0.742
Sex without a condom with someone who is using crack/cocaine (3 months)	215	-0.035	354	0.021	0.514
Sex without a condom with someone who is using crack/cocaine (9 months)	233	0.047	336	-0.330	0.349
Total deviance (3 months)	209	-0.020	360	0.011	0.734
Total deviance (9 months)	218	0.048	351	-0.030	0.368

Independent samples t-tests were conducted to examine the mean differences in the low self-control factor score between missing and non-missing for a sample of post-treatment outcome data. The t-tests revealed that that for a majority of the variables analyzed there were no moderately significant (0.10 alpha level) or statistically significant (0.05 alpha level) differences in missing and non-missing post-treatment outcome data at both the 3 and 9 month follow-up periods when comparing the low self-control factor score means. Therefore, we can generally conclude data availability is not related to the low self-control factor score for parolees.

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Table 5.14. Pearson's r Correlation Between Age, Low Self-Control Factor Score, Peer-Association Factor Score, Perceptions of Fairness Factor Score, and Dosage Data

	1	2	3	4	5	6	7	8
Client Age								
Low Self-Control factor score	-0.221**							
Peer Association factor score	-0.157**	0.147**						
Perceptions of Fairness factor score	-0.102	0.006	0.066					
Avg # of minutes for ind. sessions with parole officer (CBM + CTRL)	0.041	0.007	0.036	-0.002				
Avg ind. sessions per month with parole officer (CBM + CTRL)	0.026	0.029	0.044	0.020	0.964**			
Avg # of minutes for ind. sessions with trt counselor (CBM + CTRL)	0.014	0.012	0.026	0.007	0.967**	0.938**		
Avg ind. sessions per month with treatment counselor (CBM + CTRL)	0.013	0.014	0.022	0.112*	0.946**	0.938**	0.971**	

$p < 0.05$*
$p < 0.001$**

The Pearson's r correlations analysis for continuous variables was conducted between age, low self-control factor score, peer association factor score, perceptions of fairness factor score, and dosage effect variables. This analysis was conducted to understand the direction and magnitude of the relationship between various continuously coded variables that are utilized in the final multivariate models at the end of this chapter and the confirmatory factor analysis results that are presented and interpreted in chapter 6. Statistically significant relationships in table 5.14 are further interpreted on the linear direction and magnitude of the relationship between the eight continuous variables that will also be examined in the exploratory multivariate logistic and linear regression analyses that follow ahead.

Age and the Low Self-Control Factor score were negatively correlated, r (567) = -0.221, $p < 0.001$. Age and Peer Association Factor score were negatively correlated, r (567) = -0.157, $p < 0.001$. Peer Association Factor score and Low Self-Control Factor score were positively correlated, r (567) = 0.147, $p < 0.001$. Therefore, as an individual increases in age it has been found that they exhibit more self-control and decrease their socialization with negative peer-

influences or associates. The significant findings from these Pearson's r correlations are consistent with has been found in the previous literature, particularly that age is negatively correlated with both low self-control and peer-associations (Gottfredson and Hirschim, 1990; Akers, 1991, Langton, 2006). The relationship between the two theoretical constructs low self-control and peer associations is also consistent with the previous literature that has found that as an individual has increased levels of self-control, they decrease their negative peer-associations (Yarbrough et al., 2011). Yarbrough et al. (2011) argues that individuals characterized as having low self-control traits are at-risk of developing negative peer-associations because they tend to bond with individuals with similar personality characteristics and criminogenic risk factors. As a result of the interaction between low self-control personality traits and negative peer association, it is hypothesized that a social-amplification effect takes place and causes individuals with low self-control to engage in increased rates of recidivism and substance abuse. Where as individuals with low self-control who do not affiliate with negative peer-associates are hypothesized to have a decreased probability of engaging in recidivism and substance use.

Average individual sessions per month with parole officer and average number of minutes for individual sessions with parole officer were positively correlated, $r(567) = 0.964$, $p < 0.001$. Average individual sessions per month with parole officer and average number of minutes for individuals sessions with treatment counselor were positively correlated, $r(567) = 0.967$, $p < 0.001$. Average number of minutes for individual sessions with treatment counselor and average individual sessions per month with parole officer were positively correlated, $r(567) = 0.938$, $p < 0.001$. Average individual sessions per month with treatment counselor and Perceptions of Fairness factor score were positively correlated, $r(336) = 0.112$, $p < 0.05$. Average individual sessions per month with treatment counselor and average number of minutes

for individual sessions with parole officer were correlated, r (567) = 0.946, p < 0.001. Average

individual sessions per month with treatment counselor and average individual sessions per

month with parole officer were positively, r (567) = 0.938, p < 0.001. Average individual

sessions per month with treatment counselor and average number of minutes for individual

sessions with treatment counselor were positively correlated, r (567) = 0.971, p < 0.001.

The findings from the Pearson's r correlation analysis revealed that the four dosage

measurements strongly echo each other in a positive direction and with a strong magnitude with

an almost near perfect correlation of 1.00. Therefore, these results reinforce the fact that an

increased amount of dosage in one domain of an experimental treatment study is strongly

correlated with increased amounts of dosage in other domains of the treatment intervention. This

analysis conclusively demonstrates that increased exposure to parole officers also increases

exposure to substance abuse treatment counselors in terms of average number of minutes and

average number of sessions while participating in the Step' n Out study. Similar findings have

also been demonstrated in previous research studies that examined the relationship between

treatment dosage and post-treatment outcomes for offenders in rehabilitation programs (Cullen

and Gendreau, 2000; Sung et al., 2001; Sung et al., 2004).

Finally, it was found that increased number of sessions with the treatment counselor

increases parolee's perceptions of fairness about parole officers/treatment counselors. This

finding is consistent with the predictions held by procedural justice theory (Tyler, 2003; Reisig et

al., 2011). As previously discussed in the literature review, Tyler (2003) hypothesizes that

evaluations of procedural fairness and development of legal orientation (e.g. legal cynicism and

legitimacy) by those effected by the law (e.g. parolees) are positively related to direct and

vicarious experiences that they have with legal authorities (e.g. parole officers). The next section

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provides the results from the exploratory multivariate analyses that were conducted using post-treatment outcomes measured at both the 3 and 9 month follow-up periods.

III. *Exploratory Multivariate Analysis Results.*

Previous research cited in the literature review in chapters 2, 3, and the results from the bivariate analyses conducted earlier in chapter 5 have helped specify the subsequent models that were used to analyze and predict the odds-ratios for post-treatment outcomes (substance use, recidivism, analogous behaviors, and total deviance) using logistic regression analyses. The specified model structure was also used to predict perceptions of fairness factor score using multiple regression analysis.

The results from the series of exploratory logistic regression analyses that were conducted indicate that the low self-control factor score is not a statistically significant predictor of post-treatment outcomes when controlling for the other variables entered into the models. The results also clearly indicate that the treatment condition (CBM vs. control group) does not moderate the relationship between the low self-control factor score and post-treatment outcomes when controlling for the other variables entered into the model. Therefore, the interaction between low self-control factor score and treatment condition is not a statistically significant predictor of post-treatment outcomes.

The theoretically specified exploratory model structure illustrates that parolees across the self-control spectrum (high and low levels) and treatment conditions (CBM vs. control group) are engaging in post-treatment drug use, recidivism, and analogous behaviors. The findings for research question 1 from this dissertation are contrary to the predictions of low self-control theory (Gottfredson and Hirschi, 1990). Gottfredson and Hirschi (1990) would have hypothesized that parolees with low self-control would have statistically significant higher odds

ratios for engaging in post-treatment outcomes compared to parolees who did not self-report engaging in post-treatment outcomes. Therefore, in the discussion section (chapter 7), the interpretation of these results will be discussed and possible contextual explanations for the post-treatment outcomes will be put forward.

Although, the non-significant main effect for the low self-control factor score predicting post-treatment outcomes runs contrary to Gottfredson and Hirschi's (1990) theory, the exploratory multivariate analysis results, as discussed in the second part of research question 1, was found to be consistent with low self-control theory. The non-significant interaction between low self-control and treatment condition is consistent with low self-control theory, because Gottfredson and Hirschi (1990) argue that criminal justice system interventions cannot reverse a lifetime of socialization related to levels of self-control (p. 269).

It should be noted that a few of the control variables were consistent with the previous research literature. In particular, the age of parolees, was found to be a strong and nearly consistent predictor of post-treatment recidivism data at the 3 month follow-up period. Increases in age decreased the odds of engaging in post-treatment recidivism at the 3 month follow-up. The aging out of crime effect has been thoroughly documented in the literature and numerous theoretical explanations that range the positivist spectrum have posited explanations for the mechanism by which age effects engagement in crime (Gottfredson and Hirschi, 1990; Tittle et al., 2003).

Also, classical theoretical explanations related to rational choice theory and opportunity theories such as routine activities theory explain the aging out of crime effect as being related to decreased incentives and minimal opportunities to engage in criminal behavior as an individual gets older. Sampson and Laub (1990) developed an age graded theory of social control that

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argues that as an individual ages they experience various life trajectories and transition periods that involve getting married, having children, going to college, and acquiring a stable job. Sampson and Laub's (1990) life-course theory would argue that these periods of transition act as social controls that prevent individuals with criminal propensities from engaging in crime (O'Connell, 2003).

Gottfredson and Hirschi (1990) would argue that the negative relationship between age and engaging in crime is not caused by increases in self-control or social-controls, but is instead primarily caused by decreases in opportunities to engage in crime. Furthermore, Gottfredson and Hirschi (1990) argue that those individuals who had a history of criminality during adolescent but end up getting married, having families, obtaining stable jobs, and desisting from crime as they age are the same individuals who have higher levels of self-control. Individuals who demonstrate criminal behaviors that are life-course persistent simply have low levels of self-control and are unlikely to form strong social bonds even as adults.

Age at first arrest (less than 19 years old or greater than or equal to 19 years old) was found to be a strong predictor of analogous behaviors at the 3 month follow-up. Therefore, parolees who had their first arrest before the age of 19 increased their odds of engaging in risky sexual practices involving multiple partners without using condoms. These findings may be spurious and point to confounding theoretical variables that were not controlled for such as socio-economic status, religious orientation, and biological/neurological characteristics of offenders (Ratchford and Beaver, 2009). However, Gottfredson and Hirschi (1990) would argue that age at first arrest is linked to levels of self-control. Therefore, individuals arrested before the age of 19, most likely have lower levels of self-control and have a strong propensity to engage in criminal and analogous behaviors.

Using dummy variable adjustment, logistic regression analyses were conducted on a subset of post-treatment outcome variables with missing data using the specified exploratory model structures. It was found that low self-control and the control variables were not consistently statistically significant predictors of missing data versus available data for the subset of post-treatment outcomes that were analyzed at both the 3 and 9 month follow-up periods. These findings suggest that something other than low self-control and the control variables entered into the models are driving rates of non-completion of post-treatment outcomes. However, it should be noted that age at first arrest was a statistically significant predictor of missing data at the 3 month follow-up for crack use and having sex with a casual partner without using a condom. Parolees arrested before the age of 19 had high odds-ratios for having missing data compared to parolees with available data. It should also be noted that these findings could not be replicated at the 9 month follow-up period.

Finally, for research question 2, a multiple regression analysis was conducted using the specified model structure to predict the continuously coded outcome variable, perceptions of fairness factor score. The results from table 5.16, indicate that gender, average number of minutes with the treatment counselor, and the treatment condition statistically significantly predict perceptions of fairness. Specifically, it was found that being male, increased average number of minutes with the treatment counselor, and being assigned to the Collaborative Behavioral Management intervention decreased perceptions of fairness. The statistically significant findings related to gender, the dosage variable, and the treatment condition will be further explained through Tyler's (2003) procedural justice theory in the discussion section of chapter 7.

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Also it should be noted that the low self-control factor score and the moderator predictor variables were not found to be statistically significantly predictors of perceptions of fairness. These findings in addition to the findings from the series of logistic regression analyses, ultimately demonstrate that for parolees in the Step'n Out study, the low self-control factor score is not a strong predictor of substance use, recidivism, analogous behaviors and perceptions of fairness. More contextualized explanations related to negative credentialing and the stigma of addiction are needed for understanding post-treatment outcomes and perceptions of fairness related to the Collaborative Behavioral Management intervention (Pager, 2003).

Logistic Regression Analysis of 3 and 9 Month Follow-Up Post-Treatment Outcome Data.

Table 5.15. Logistic Regression Odds-Ratios and Significance Levels for Self-Reported Post-Treatment Outcomes

	Physically/ Verbally Threatened Someone at 3 month recall (Yes = 1)	Physically/ Verbally Threatened Someone at 9 month recall (Yes = 1)	# Has parolee recidivated in the 3 month recall period	# Has parolee recidivated in the 9 month recall period	Ever engaged in post-treatment deviance at 9 month follow up (1 = engaged in deviance at least once)
Age	0.973	0.955 +	0.969*	0.974	0.963+
Gender (Male = 1)	1.159	1.873	0.764	0.585	0.893
Race (White = 1)	0.732	0.516	0.836	0.503*	0.289*
Age at first arrest (Less than 19 years= 1)	2.971 +	1.456	1.459	1.325	1.892
Divorced status (Divorced atleast once = 1)	1.927	1.078	0.596 +	0.599	0.790
School completion status (Dropped out = 1)	0.840	0.920	0.804	1.279	1.353
Average number of minutes for individual sessions with parole officer	1.019	1.004	1.000	0.983 +	1.005
Average individual sessions per month with parole officer	0.937	0.935	0.858 +	1.02	1.227
Average number of minutes for individual sessions with treatment counselor	1.004	1.004	0.99*	0.995	0.993
Average individual sessions per month with treatment counselor	0.970	0.971	1.016	0.973	0.887
Peer-Association Factor Score	1.043	1.085	0.897	0.987	0.984
Treatment Condition (Collaborative Behavioral Management = 1)	0.333 +	1.029	0.585*	0.57*	0.393*
Self-Control Factor Score	1.632 +	1.521	1.079	1.226	1.375
Self-Control Factor Score * Treatment Condition	1.711	0.843	1.089	0.964	0.795
Constant	0.080 +	0.305	9.47**	26.134**	15.075
Neg. 2 LL	154.695	182.293	389.99	326.735	177.102
Chi-square test	29.226*	12.591	32.299**	30.252**	22.963+

p < 0.10 +
p < 0.05*
P < 0.01**
p < 0.001***

The logistic regression analyses that are reported in this section are for the post-treatment outcome variables that were found to be statistically significant different in terms of mean levels of self-control as reported in the bivariate analyses section. Physically/Verbally threatening someone at both the 3 and 9 month follow-up periods, the combined recidivism variables at both the 3 and 9 month follow-up periods, and the combined measure of deviance at the 9 month follow-up period were all found to be significant in the bivariate analyses section and are further explored in this section, to determine whether the main-effect of self-control is statistically significant even when control variables are entered into the models.

I. Predicting physically/verbally threatening someone at the 3 month follow-up

The first logistic regression analyzed the post-treatment recidivism outcome variable number of times parolee physically/verbally threatened someone at the 3 month follow-up. In order to test for the significance of including the predictor and control variables into the final model the researcher observed that the -2 LL was 154.695. Including the independent variables into the model improved its ability to predict the odds of parolee physically/verbally threatening someone at least once compared to never physically/verbally threatening someone because the -2 LL was lower in the full model and the related chi-square was statistically significant (chi-square of 29.226, p < 0.05). Thus, we have significantly improved our ability to predict the number of times parolee physically/verbally threatening someone.

Since the model in table 5.15 for number of times parolee physically/verbally threatened someone is statistically significant, we are interested in examining which individual relationships are significant and interpreting them using the significance level and odds ratio. Divorce status marginally significantly predicts odds of physically/verbally threatening someone (p < 0.10).

Being divorced at least once increases the odds of physically/verbally threatening someone by 2.971 times compared to parolees who were single/never divorced. Treatment condition marginally significantly predicts parolee physically/verbally threatening someone ($p < 0.10$). Being randomly assigned to the Collaborative Behavioral Management intervention reduces the odds of a parolee physically/verbally threatening someone by 0.333 times. The low self-control factor marginally significantly predicts the odds of a parolee physically/verbally threatening someone ($p < 0.10$). A one unit increase in the low self-control factor score increases the odds of a parolee physically/verbally threatening someone by 1.632 times. The moderator variable and remaining control variables inputted into the model did not statistically significantly predict number of times a parolee physically/verbally threatened someone at the 3 month follow-up ($p > 0.10$).

II. Predicting physically/verbally threatening someone at the 9 month follow-up

The second logistic regression analyzed the post-treatment recidivism outcome variable number of times parolee physically/verbally threatened someone at the 9 month follow-up. In order to test for the significance of including the predictor and control variables into the final model the researcher observed that the -2 LL was 182.293. Including the independent variables into the model did not improve its ability to predict the odds of parolee physically/verbally threatening someone at least once compared to never physically/verbally threatening someone because the -2 LL was not lower in the full model and the related chi-square was not statistically significant (chi-square of 12.591, $p > 0.10$). Thus, we have not significantly improved our ability to predict the number of times parolee physically/verbally threatening someone at least once at the 9 month follow-up.

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III. Predicting whether the parolee has recidivated at the 3 month follow-up

The third logistic regression analyzed the combined post-treatment recidivism outcome variable at the 3 month follow-up. In order to test for the significance of including the predictor and control variables into the final model the researcher observed that the -2 LL was 389.990. Including the independent variables into the model improved its ability to predict the odds of parolee committing recidivism at least once compared to never committing recidivism because the -2 LL was lower in the full model and the related chi-square was statistically significant (chi-square of 32.299, $p < 0.01$). Thus, we have significantly improved our ability to predict the number of times parolee has recidivated at the 3 month follow-up.

Since the model in table 5.15 for number of times parolee recidivated is statistically significant, we are interested in examining which individual relationships are significant and interpreting them using the significance level and odds ratio. Age statistically significantly predicted recidivism ($p < 0.05$). A one unit increase in age decreases the odds of committing recidivism at least once by 0.969 times. Divorce status marginally significantly predicted the odds of committing recidivism at least once ($p < 0.10$). Being divorced at least once decreased the odds of committing recidivism at least once by 0.596 times compared to parolees who were single/never divorced. Average individual sessions per month with parole officer significantly predicted parolee committing recidivism at least once ($p < 0.10$). A one unit increase in average individual sessions per month with parole officer decreased the odds of a parolee committing recidivism by 0.858 times. Average number of minutes for individual sessions with treatment counselor statistically significantly predicted parolees committing recidivism at least once ($p < 0.05$). A one unit increase in the average number of minutes for individual sessions with treatment counselor decreased the odds of parolee recidivating at least once by 0.99 times.

Treatment condition statistically significantly predicted the odds of parolees committing recidivism at least once (p < 0.05). Parolees randomly assigned to the Collaborative Behavioral Management intervention decreased their odds of recidivating at least once by 0.585 times compared to parolees randomly assigned to the control group. The low self-control factor score, moderator variable, and remaining control variables inputted into the model did not statistically significantly predict number of times parolee recidivated at the 3 month follow-up (p > 0.10).

IV. Predicting whether the parolee has recidivated at the 9 month follow-up

The fourth logistic regression analyzed the combined post-treatment recidivism outcome variable at the 9 month follow-up. In order to test for the significance of including the predictor and control variables into the final model the researcher observed that the -2 LL was 326.735. Including the independent variables into the model improved its ability to predict the odds of parolee committing recidivism at least once compared to never committing recidivism because the -2 LL was lower in the full model and the related chi-square was statistically significant (chi-square of 30.252, p < 0.01). Thus, we have significantly improved our ability to predict the number of times parolee has recidivated at the 9 month follow-up.

Since the model in table 5.15 for number of times parolee recidivated is statistically significant, we are interested in examining which individual relationships are significant and interpreting them using the significance level and odds ratio. Race is a statistically significant predictor of the odds of recidivating (p < 0.05). Being racially coded as white decreased the odds of recidivating by 0.503 times compared to being racially coded as other. The average number of minutes for individual sessions with parole officer marginally significantly predicted the odds of recidivating (p < 0.10). A one unit increase in the average number of minutes for individual sessions with parole officer decreased the odds of recidivating by 0.983 times. Treatment

condition statistically significantly predicted the odds of recidivating ($p < 0.05$). Parolees

randomly assigned to the Collaborative Behavioral Management intervention decreased their

odds of recidivating by 0.57 times compared to parolees randomly assigned to the control group.

The low self-control factor score, moderator variable, and remaining control variables inputted

into the model did not statistically significantly predict number of times parolees recidivated at

the 9 month follow-up ($p > 0.10$).

V. Predicting the number of times parolees had engaged in deviant behaviors at the 9 month

follow-up

The fifth logistic regression analyzed the post-treatment total deviant behavior outcome

variable at the 9 month follow-up. In order to test for the significance of including the predictor

and control variables into the final model the researcher observed that the -2 LL was 177.102.

Including the independent variables into the model improved its ability to predict the odds of

parolee self-reporting deviant behavior compared to never self-reporting deviant behavior

because the -2 LL was lower in the full model and the related chi-square was marginally

significant (chi-square of 22.963, $p < 0.10$. Thus, we have significantly improved our ability to

predict deviant behavior at the 9 month follow-up.

Since the model in table 5.15 for measuring deviant behavior at the 9 month follow-up is

statistically significant, we are interested in examining which individual relationships are

significant and interpreting them using the significance level and odds ratio. Age was a

marginally significant predictor of the odds of engaging in deviant behavior at least once ($p <$

0.10). A one unit increase in age decreases the odds of a parolee engaging in deviant behavior by

0.963 times. Parolee racial category is a statistically significant predictor of deviant behavior ($p <$

0.05). Parolees who were racially categorized as white decreased their odds of engaging in

deviant behaviors by 0.289 times compared to parolees racially coded as other. Treatment

condition status statistically significantly predicted engagement in deviant behavior ($p < 0.05$).

Parolees randomly assigned to the Collaborative Behavioral Management intervention decreased

their odds of engaging in deviant behavior by 0.289 times compared to parolees randomized to

the control group. The low self-control factor score, moderator variable, and remaining control

variables inputted into the model did not statistically significantly predict the total deviant

behavior outcome measured at the 9 month follow-up ($p > 0.10$).

Multiple Regression Analysis of Perceptions of Fairness Factor Score.

Table 5.16. Multiple Regression for Predicting Perceptions of Fairness Factor Score at the 3 Month Follow-up

	B	Beta	Sig	Tolerance	VIF
Age	-0.008	-0.075	0.202	0.868	1.152
Gender (Male = 1)	-0.349	-0.135	0.021*	0.872	1.147
Race (White = 1)	-0.003	-0.001	0.979	0.945	1.059
Age at first arrest (Less than 19 years= 1)	0.124	0.060	0.294	0.913	1.095
Divorced status (Divorced atleast once = 1)	-0.167	-0.078	0.200	0.806	1.240
School completion status (Dropped out = 1)	-0.097	-0.047	0.413	0.894	1.119
Average number of minutes for individual sessions with parole officer	-0.004	-0.058	0.300	0.945	1.058
Average individual sessions per month with parole officer	-0.056	-0.083	0.153	0.881	1.135
Average number of minutes for individual sessions with treatment counselor	-0.006	-0.199	0.003**	0.666	1.501
Average individual sessions per month with treatment counselor	-0.036	-0.091	0.160	0.704	1.420
Peer-Association Factor Score	-0.011	-0.012	0.830	0.928	1.077
Treatment Condition (Collaborative Behavioral Management = 1)	-0.311	-0.161	0.005**	0.898	1.113
Self-Control Factor Score	0.005	0.006	0.946	0.434	2.305
Self-Control Factor Score * Treatment Condition	-0.122	-0.101	0.207	0.458	2.183
Constant	1.417		0.000***		

$p < 0.10$†
$p < 0.05$*
$P < 0.01$**
$p < 0.001$***

A multiple regression analysis was conducted to predict the Perceptions of Fairness

Factor Score. The multiple regression model indicates that the R^2 is 0.384 which means that

38.4% of the variation in the standardized factor loading of the dependent variable "Perceptions

of Parole Officer/Counselor Fairness" factor score is explained by the independent variables that

have been listed in table 5.16. The Durbin-Watson is interpretable here because we have more

than one independent variable. The Durbin-Watson test indicates 2.004 which is above the cutoff of 1.6. Therefore, the Durbin-Watson test indicates that there is no autocorrelation between independent variables which does not violate the independence assumptions of multiple regression analysis. The F-Statistic (3.576) is significant ($p < 0.001$) which means that the independent variables statistically significantly predicts for the variation in the Perceptions of Fairness Factor Score ($R^2 = 0.384$, $F (14, 289) = 3.576$, $p < .001$).

In table 5.16 we see that the slope (B) for the effect of male is -0.349 and is statistically significant ($p < 0.05$). Being male did statistically significantly predict the Perceptions of Parole Officer Fairness Factor Score (B= -0.349, beta= -0.135, $p < .05$). Being a male parolee decreases their Perceptions of Fairness Factor Score by 0.349 units compared to being a female parolee. Therefore, males are less likely to have positive Perceptions of Fairness about their participation in the Step'n Out study compared to females.

In table 5.16 we see that the slope (B) for the effect of average number of minutes for individual sessions with treatment counselor is -0.006 and is statistically significant ($p < 0.05$). Average number of minutes for individual sessions with treatment counselor did statistically significantly predicted the Perceptions of Parole Officer Fairness Factor Score (B= -0.006, beta= -0.199, $p < .05$). A one unit increase in the average number of minutes for individual sessions with treatment counselor decreases parolees' Perceptions of Fairness Factor Score by 0.006 units. Therefore, parolees with high average number of minutes for individual sessions with the treatment counselor are less likely to have positive Perceptions of Fairness about their participation in the Step'n Out study compared to parolees with less average number of minutes with treatment counselor.

In table 5.16 we see that the slope (B) for the treatment condition is -0.311 and is statistically significant (p < 0.01). Being randomly assigned to the Collaborative Behavioral Management intervention predicted the Perceptions of Parole Officer Fairness Factor Score (B= -0.311, beta= -0.161, p < .01). Being randomly assigned to the Collaborative Behavioral Management intervention decreases parolees' Perceptions of Fairness Factor Score by 0.311 units. Therefore, parolees in the Collaborative Behavioral Management intervention are less likely to have positive Perceptions of Fairness about their participation in the Step'n Out study compared to parolees randomly assigned to the control group.

The tolerance and VIF levels for each variable indicate that multicollinearity is not an issue in the model. The casewise diagnostics have identified a list of cases whose residuals are more than 3 standard deviations away from what would be expected. In this study we will not remove any cases. The Normal P-P plot demonstrated the expected cumulative probabilities to line up reasonably well with the observed cumulative probabilities, indicating no violation of the normality assumption. Finally, a scatterplot of the standardized residuals and the standardized predicted values indicated a slight violation of linearity and a potential presence of heteroscedasticity because of the "fanning" out of the relationship at high predicted values. However, the issue is not serious enough to warrant a disregard of the model coefficients and statistics.

Chapter 6

Confirmatory Factor Analysis Results

This chapter begins by providing an introduction to the Confirmatory Factor Analysis (CFA) approach and discusses its importance as a statistical method for assessing the internal validity and structure of latent theoretical constructs. Next, this chapter provides a literature review of previous tests of Gottfredson and Hirschi's (1990) low self-control through the CFA approach. This chapter concludes by describing the results from the third research question presented at the end of chapter 1.

Using the CFA approach, this study sought to examine the direction and strength of three latent constructs (low self-control, peer-associations, and perceptions of fairness) on the latent construct of post-treatment deviance measured at both the 3 and 9 month follow-up period through a factor model. Next, this study reports the results from the full structural model, which examines the strength and direction of the latent constructs on post-treatment deviance while including fully exogenous control variables into the analytic model. The findings from this chapter suggest that in the factor only model the low self-control construct, in the hypothesized direction, marginally effects post-treatment deviance measured at the 3 month follow-up. However, in the full structural model, the low self-control construct is no longer marginally significant when the control variables are included in the model. Therefore, theoretical refinement of low self-control theory or alternative theories maybe needed to explain the post-treatment deviant behaviors of parolees.

Previous Tests of Low Self-Control Theory Using Confirmatory Factor Analysis

Using data collected from undergraduate students from the University of Oklahoma, Cochran et al. (1998) sought to test the relationship between self-control and academic

dishonesty. The researchers hypothesized that individuals with low self-control compared to individuals with high self-control, will engage in higher rates of academic dishonesty. In order to test this hypothesis, Cochran et al. (1998) conducted a maximum likelihood confirmatory factor analysis using a 38 item scale for measuring self-control and found that there was the presence of a single latent variable, which the researchers presume is a unidimensional measure of self-control. However, Cochran et al. (1998) reports that the model fails to fit the data. An alternative model was proposed and analyzed that measured second-order factors related to impulsivity, risk-taking, preference for simple tasks, preference for physical activities, temper, and self-centeredness.

Cochran et al. (1998) found ambiguous support for Gottfredson and Hirschi's (1990) assumption that low self-control is a unidimensional construct. However, the GFI fell below the commonly recommended standard of 0.90 in their study. Also the factor loadings for the second-order factors varied considerably from impulsivity loading at a robust 0.77, simple tasks, self-centeredness, and anger loaded at 0.58, 0.54, and 0.59 respectively. Risk-taking and physicality loaded weakly at 0.39 and 0.13. The multi-dimensional measures of self-control vary in strength based on their factor loadings, therefore, the results from the study conducted by Cochran et al. (1998) indicates that a unidimensional measure of self-control provides more reliable and valid predictions of future criminality and analogous behaviors compared to multidimensional constructs of self-control.

Using data collected from a student population at a public university, Piquero et al. (2000) used CFA to detect the presence of a unidimensional low self-control construct among 24 items found in Grasmick et al. (1993) low self-control scale through examining the fitness of the model to the data. Piquero et al. (2000) found that all 24 items load significantly on the self-

control construct. However, upon further inspection of the goodness-of-fit indices, it was found that the model does not fit the data well and the RMSEA is equal to 0.13, above the cutoff of 0.06 and the chi-square divided by the degrees of freedom was equal to 4.9994 which is close to the cutoff of 5. Next, Piquero et al. (2000) specified a second-order factor structure, which indicate significant loadings for all 24 items on six separate subdimensions of self-control, with factor loadings ranging from 0.23 to 0.62. The researchers state that there is a fair amount of unexplained variance and that their findings are troubling for Gottfredson and Hirschi's (1990) low self-control theory, because the subdimensional constructs were not correlating highly with the unidimensional construct of self-control. Specifically, Piquero et al. (2000) states that "evidence in favor of Gottfredson and Hirschi's hypothesis that these traits come together in the same person is somewhat clouded (p. 914)."

Using data collected from a sample of 208 male parolees, Delisi et al. (2003) examined the dimensionality of Grasmick et al. (1994) low self-control scale. The researchers conducted three CFAs: six-factor model, second-order model with seven factors, and a unidimensional model with all 24 items loading onto one factor. The model with the six latent variables indicated that all factor loadings were significant and the RMSEA was less than 0.10, which some researchers argue indicates a good fit between the model and data (Delisi et al., 2003). However, previous research studies argue that RMSEA above 0.05 is not a good fit (Kyle, 1999). The results presented by Delisi et al. (2003) from the second-order factor structure using CFA suggests that the model poorly fit the data, RMSEA was equal to 0.07 and failed to meet the critical value. The second-order model included six subdimensional latent constructs in addition to the overall latent construct of self-control. The model with all 24 items loading on to a single

latent self-control construct which was found to have the worst fit among the confirmatory factor models tested, with RMSEA equal to 0.13 (Delisi et al., 2003).

Delisi et al. (2003) states that contrary to results from prior research their series of CFA tests indicates that Grasmick et al. (1993) low self-control scale is a poor measure of the latent construct of self-control as specified by Gottfredson and Hirschi (1990). Although, all of the models poorly fit the data, the most accurate model was found to be the six-factor model. The researchers refined the six-factor model by eliminating items as indicated by the modification indices. However, Delisi et al. (2003) caution that "Unless there are theoretical or conceptual reasons, the use of modification indices to improve model fit should be interpreted skeptically… Generally, the more modifications used to fit the model, the greater the chances the model will not replicate on future samples" (p. 256). Therefore, Delisi et al. (2003) state that Grasmick et al. (1993) self-control scale requires additional validation, if it is to be accepted as a conventional measure of self-control.

Vazsonyi et al. (2001) tested the external validity of low self-control theory explaining criminality among a sample of 8417 juveniles from Hungary, the Netherlands, Switzerland, and the United States. Using hierarchical linear modeling and CFA, the researchers evaluated the validity of Grasmick et al.'s (1993) low self-control scale as a measure of self-control and its relationship to deviance and criminality. The researchers found that there were severe violations of multivariate normality in their data and proceeded to use Satorra-Bentler-corrected statistics for determining model fitness through GFI, CFI, and chi-square. Vazsonyi et al. (2001) reports that both the CFI and GFI should have a fit between 0.90 and 1.0 to be considered acceptable. Also the researchers report that the RMSEA should have a value of less than 0.05 to determine excellent fitness of the model to the data, however, a value between 0.08 and 0.1 is satisfactory

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and a value above 0.1 indicates poor fit. Vazsonyi et al.'s (2001) first confirmatory model tested the unidimensionality of low self-control using Grasmick et al.'s (1993) self-control scale and found that the model had a poor fit to the data. Vazsonyi et al. (2001) reports that the data did not fit the one-factor solution for the total sample or by sex, age, and country and had a CFI of 0.65 and GFI of 0.82.

Next, Vazsonyi et al. (2001) used CFA to determine whether a six-factor model measured using Grasmick et al.'s (1993) low self-control scale and theoretically specified by Gottfredson and Hirschi (1993) could explain criminality in the sample group. The CFA found that the six-factor solution was better for fitting the model to the data and that CFI was 0.91, GFI was 0.95, and the RMSEA was 0.05 for the total sample. The researchers report that the factor intercorrelations were moderate with a mean Pearson's r being 0.53. These results suggest that low self-control is a multidimensional trait theory for explaining criminality. The findings from the study conducted by Vazsonyi et al. (2001) strongly suggest that low self-control theory has external validity and is a generalizable predictor of criminality across Hungary, the Netherlands, Switzerland, and the U.S.

A study conducted by Vazsonyi and Crosswhite (2004) examined the external validity of low self-control for predicting criminality among rural, low socio-economic status, African-American adolescents (n = 661). The researchers also examined whether there were gender differences in measurements of low self-control among African-Americans. Vazsonyi and Crosswhite (2004) discuss how low self-control is a general theory of crime that should not be effected by cultural, racial, or national group differences and that Gottfredson and Hirschi (1990) specifically state "differences in self-control probably far outweigh differences in supervision in accounting for racial and ethnic variations" (p. 153). Using data collected from the Treatment

Alternatives to Street Crime (TASC) the researchers used CFA to find evidence that Grasmick et al.'s (1993) low self-control measure is a valid and reliable multidimensional scale that can be used to predict criminality among African-Americans and across gender.

Results from the CFA conducted by Vazsonyi and Crosswhite (2004) suggest that the one factor model measuring self-control was a good fit to the data (CFI = 0.96 and RMSEA = 0.08). Although the difference was minor, Vazsonyi and Crosswhite (2004) found that a six-factor model had an improved fit to the data (CFI = 0.97 and RMSEA = 0.07) compared to the one-factor model. The researchers state that the findings from the CFA points to a high degree of construct validity for Grasmick et al.'s low self-control scale as a multidimensional measure of self-control among African-Americans and by their gender, because the findings are aligned with previous research studies that similarly found that self-control is a multidimensional-factor (Arneklev et al., 1999; Longshore et al., 1996; Vazsonyi et al., 2001).

However, the multi-dimensional approach to operationalizing self-control remains disputed and Piquero and Rosay (1998), in particular, argue that low self-control can be explained through a parsimonious one-factor solution even across race and gender. Piquero and Rosay (1998) admit that their one-factor model that was used to fit the data was the result of numerous ad-hoc modifications to the original model such as dropping items and this may be viewed as anti-theoretical. Therefore, the previous literature indicates that when conducting theoretical tests of low self-control it remains contested whether it should be modelled through a unidimensional construct or through multidimensional constructs.

Confirmatory Factor Analysis of Parolees Participating in the Step'n Out study

This study will be using CFA to determine whether the one factor model of self-control, peer-associations, and perceptions of fairness will be a good fit to the data and a valid measure of

the theoretical constructs for predicting the post-treatment outcome, total deviance, measured at both the 3 and 9 month follow-up periods when examining parolees participating in a randomized control trial and controlling for risk, socio-demographic variables, dosage levels, and treatment condition. Based on the theory of low self-control developed by Gottfredson and Hirschi (1990) and previous research on low self-control using the CFA technique, this research study hypothesizes that low self-control is a unidimensional construct and is a stronger predictor of post-treatment total deviance than the peer-associations factor even when indirectly going through perceptions of fairness.

Initially the total deviance constructs in this study were assessed using CFA; however, the models were not able to be identified using AMOS v.20. Blunch (2013), states that "if the program fails to converge, the cause most often is that the sample is too small, or that the model is extremely misspecified, so that correlations among indicators for different latent variables are larger than correlations among indicators for the same concept... extremely non-normal data can also give rise to convergence problems (p.99)." The failure to identify the model is likely due to the total deviance factor scores being non-normally distributed and also due to the large amount of missing data found at both the 3 and 9 month follow-up periods for post-treatment outcomes.

Therefore, in order to conduct the CFA models that were theoretically specified, the researcher used the exploratory factor scores for total deviance measured at both the 3 and 9 month follow-up periods. This approach also allowed the researcher to measure the change in deviance factor scores over time by computing the difference in factors scores between the 3 and 9 month follow-up periods. Again, this model specification is grounded in the theoretical literature review which has previously demonstrated that there are direct, indirect, and interactional relationships between an individual's level of self-control, peer-associations,

perceptions of fairness, and post-treatment outcomes measured broadly as total deviance for this study.

Confirmatory Factor Analysis Results

Results from the Factor and Full Structural Models Assessing the Direct and Indirect Effects of Theoretical Constructs on Total Deviance

The comparative fit index (CFI) is a goodness of fit test that compares performance on the theoretically specified model (latent constructs) to performance on a baseline or null model. The baseline model is built on the assumption that there are no correlations between all observed variables included in the model. The root mean square error of approximation (RMSEA) is a fit indices based on the residuals matrix which observes differences between observed and predicted covariances in the model that are being tested. Observing good fit in a theoretical model does not mean that the model is correct in explaining the phenomenon of interest, it only indicates that the model is plausible, however, it is recommended to test alternative models in order to determine which model is conceptually and statistically fit for addressing research questions (Schreiber et al., 2006). The fit is different than the predictive power, because it does not determine how much of the variance in the latent constructs is explained. As prior research reports that the CFI should have a fit between 0.90 and 1.0 to be considered acceptable. Prior research also reports that the RMSEA should have a value of less than 0.05 to determine excellent fitness of the model to the data. However, a value between 0.08 and 0.1 is satisfactory and a value above 0.1 indicates poor fit (Vazsonyi et al., 2001; Schreiber et al., 2006).

The model fit criteria describes the fit indices between the CFI and RMSEA for deviance measured at the 3 month follow-up, 9 month follow-up, and the change in deviance between the 3 and 9 month follow-up periods by assessing model fitness for both the factor and full structural models. The model fit criteria for the factor model of deviance at the 3 month follow-up has a

lower than expected CFI of 0.676 which is considered unsatisfactory and a RMSEA of 0.060 which is satisfactory. The model fit criteria for the factor model of deviance at the 9 month follow-up has a lower than expected CFI of 0.667 which is considered unsatisfactory and a RMSEA of 0.066 which is satisfactory. Finally, the model fit criteria for the factor model of change in deviance between the 3 and 9 month follow-up has a lower than expected CFI of 0.676 which is unsatisfactory and a higher than expected RMSEA of 0.060 which is satisfactory.

Next, this study examined the model fit for the full structural model of deviance at the 3 month follow-up and found that it has a lower than expected CFI of 0.655 which is considered unsatisfactory and a RMSEA of 0.060 which is considered satisfactory. The model fit criteria for the full structural model of deviance at the 9 month follow-up has a lower than expected CFI of 0.656 which is considered unsatisfactory and a RMSEA of 0.060 which is considered satisfactory.

Finally, the model fit criteria for the full structural model of change in deviance between the 3 and 9 month follow-up has a lower than expected CFI of 0.676 which is unsatisfactory and a higher than expected RMSEA of 0.060 which is satisfactory. Therefore, the full structural models for explaining deviance at the 3 and 9 month follow-up periods as well as the change in deviance between those periods requires extensive theoretical refinement in order to fit the model to the data which is beyond the scope of this study. Recommendations for future model specification and theoretical refinement are made in chapter 7.

Table 6.01. CFA Factor Model Coefficients for Measuring Deviance

Latent Factors	Deviance at 3 months	Deviance at 9 months	Change in Deviance between 3 and 9 months
Peer-Associations	0.036	0.033	-0.062
Self-Control	0.218 +	0.054	-0.185
Perceptions of Fairness	0.264 +	0.046	-0.349
CFI	0.676	0.677	0.676
RMSEA	0.066	0.066	0.066

$p < 0.10$ +
$p < 0.05$*
$P < 0.01$**
$p < 0.001$***

The factor only model examined the direct effect of self-control, peer-associations, and perceptions of fairness on total deviance at both the 3 and 9 month follow-up periods and also the effect on change in deviance between the 3 and 9 month follow-up periods without controlling for any of the observable socio-demographic, risk, dosage levels, and treatment condition variables (Porter, 2008). The only moderately significant findings for the factor models were found in the examination of deviance at the 3 month follow-up period. Both self-control and perceptions of fairness were found to have marginally significant direct effects on the measure of deviance at the 3 month follow-up period. However, the direct effects of self-control and perceptions of fairness were not found when examining deviance at the 9 month follow-up period and change in deviance between the 3 and 9 month follow-up period. These findings indicate that the latent theoretical constructs were either weakly specified or are completely unrelated to post-treatment deviance.

Table 6.02. CFA Full Structural Model Coefficients for Measuring Deviance

Latent Factors and Control Variables	Deviance at 3 months	Deviance at 9 months	Change in Deviance between 3 and 9 months
Age	-0.005	-0.022**	-0.022+
Gender (male = 1)	0.09	-0.151	-0.4
Race (white = 1)	-0.037	-0.452***	-0.555*
Age at first arrest (< 19 years = 1)	-0.34*	-0.053	-0.112
Divorce Status (yes divorced = 1)	0.201	0.139	0.004
School Status (dropped out of school = 1)	0.171	0.14	0.107
Treatment Condition (CBM = 1)	-0.001	-0.064	-0.487*
Average number of minutes for individual sessions with parole officer	0.002	-0.004	-0.008
Average individual sessions per month with parole officer	0.07+	0.083+	0.023
Average number of minutes for individual sessions with treatment counselor	-0.002	-0.005+	-0.005
Average individual sessions per month with treatment counselor	-0.026	0.019	0.051
Peer-Association	0.014	0.041	-0.037
Self-Control	0.128	-0.06	-0.334
Perceptions of Fairness	0.269+	-0.006	-0.666**
CFI	0.655	0.656	0.655
RMSEA	0.06	0.06	0.06

$p < 0.10$+
$p < 0.05$*
$P < 0.01$**
$p < 0.001$***

The full structural model results are presented in table 6.02, includes all of the control variables along with the self-control, peer-associations, and perceptions of fairness latent factors in order to decompose any direct effects at both the 3 and 9 month follow-up periods on total deviance and also the change in deviance between the 3 and 9 month follow-up periods (Porter, 2008). Porter (2008) reports that the full structural model will decompose all of the effects of the fully exogenous control variables indirectly through the self-control, peer-associations, and perceptions of fairness factors, allowing for the possible identification of spurious relationships due to common causes in the antecedent control variables (p. 49).

The decompositional analysis conducted in this study examined the effects of the control variables and latent factors that were found to be significant in the full structural model for measuring post-treatment deviance at the 3 month follow-up period. The results in table 6.02 indicate that individuals who were arrested before the age of 19, having an increase in average individual sessions per month with parole officer, and increases in perceptions of fairness were

found to have a direct effect on deviance at the 3 month follow-up. Therefore, if you were below the age of 19 when first arrested, you are less likely to engage in deviance at the 3 month follow-up. This finding is contrary to findings in the exploratory statistical analyses in chapter 5 that found that being arrested before the age of 19 predicts post-treatment substance use and recidivism outcomes. Also, increases in parole sessions and perceptions of fairness were found to be related to increases in post-treatment deviance at the 9 month follow-up period. Therefore, due to the weak theoretical specification of the model as indicated by the CFI and RMSEA, these findings should be interpreted with caution and tested with alternative model specifications.

Next, a decompositional analysis of measuring deviance at the 9 month follow-up period reveals that age, race, average number of sessions with parole officer, and average number of minutes with the treatment counselor are significant. Specifically, the full structural model reveals that increases in age are associated with decreases in deviance at the 9 month follow-up. Being coded as racially white is associated with decreases in deviance at the 9 month follow-up. Also, increases in minutes with the treatment counselor are associated with decreases in deviance at the 9 month follow-up. However, similar to the 3 month follow-up, it was found that increases in the average number of individual sessions with parole officer per month were associated with increases in deviance at the 9 month follow-up period. Previous research conducted by Grattet, Petersilia, and Lin (2008) found that more intensive parole supervision leads to increases in detection of parole violations, similarly, the this study found that increases in supervision are associated with increases in deviance. However, this finding requires further analysis, in order to understand the causal mechanism by which post-treatment deviance is related to increases in supervision.

Finally, examining the full-structural model for measuring change in deviance between the 3 and 9 month follow-up periods reveals that age, race, treatment condition, and perceptions of fairness were directly related to the changes in deviance. Specifically, decreases in age were associated with changes in deviance between the 3 and 9 month follow-up periods. Being racially coded as white was found to be associated with changes in deviance between the 3 and 9 month follow-up period. Being randomly assigned to the Collaborative Behavioral Management intervention was associated with changes in deviance between the 3 and 9 month follow-up period. An increase in perception of fairness was associated with changes in deviance between the 3 and 9 month follow-up periods.

Table 6.03. CFA Effect Decomposition - Full Structural Model for Measuring Total Deviance at the 3 Month Follow-Up

Exogenous Variable	Direct Effects Via Self-Control	Direct Effects Via Peer Associations	Direct Effects Via Perceptions of Fairness	Total Effect on Total Deviance at 3 Months
Age	-0.007*	-0.013**	-0.006┼	-0.005
Gender (male = 1)	-0.092	0.014	-0.029	0.09
Race (white = 1)	-0.108┼	-0.04	0.03	-0.037
Age at first arrest (< 19 years = 1)	-0.217***	-0.107	-0.132┼	-0.34*
Divorce Status (yes divorced = 1)	-0.053	-0.059	-0.024	0.201
School Status (dropped out of school = 1)	0.188***	0.213*	0.033	0.171
Treatment Condition (CBM = 1)	-0.043	-0.06	-0.403***	-0.001
Average number of minutes for individual sessions with parole officer	0.002	0	-0.002	0.002
Average individual sessions per month with parole officer	0.026	0.003	-0.023	0.07┼
Average number of minutes for individual sessions with treatment counselor	0	0	-0.002*	-0.002
Average individual sessions per month with treatment counselor	-0.004	-0.019	-0.004	-0.026
Peer-Association			0.003	0.014
Self-Control			0.023	0.128
Perceptions of Fairness				0.269┼

p < 0.10 ┼
p < 0.05*
P < 0.01**
p < 0.001***

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Table 6.04. CFA Effect Decomposition - Full Structural Model for Measuring Total Deviance at the 9 Month Follow-Up

Exogenous Variable	Direct Effects Via Self-Control	Direct Effects Via Peer Associations	Direct Effects Via Perceptions of Fairness	Total Effect on Total Deviance at 9 Months
Age	-0.007*	-0.013**	-0.006✝	-0.022**
Gender (male = 1)	-0.092	0.014	-0.028	-0.151
Race (white = 1)	-0.108✝	-0.04	0.029	-0.452***
Age at first arrest (< 19 years = 1)	-0.216***	-0.107	-0.132✝	-0.053
Divorce Status (yes divorced = 1)	-0.053	-0.058	-0.022	0.139
School Status (dropped out of school = 1)	0.188***	0.213*	0.034	0.140
Treatment Condition (CBM = 1)	-0.044	-0.06	-0.403***	-0.064
Average number of minutes for individual sessions with parole officer	0.002	0.000	-0.002	-0.004
Average individual sessions per month with parole officer	0.028	0.003	-0.023	0.083✝
Average number of minutes for individual sessions with treatment counselor	0.000	0.000	-0.002*	-0.005✝
Average individual sessions per month with treatment counselor	-0.004	-0.019	-0.004	0.019
Peer-Association			0.002	0.041
Self-Control			0.024	-0.060
Perceptions of Fairness				-0.006

p < 0.10 ✝
p < 0.05*
P < 0.01**
p < 0.001***

Table 6.05. CFA Effect Decomposition - Full Structural Model for Measuring Change in Total Deviance Between the 3 and 9 Month Follow-Up Periods

Exogenous Variable	Direct Effects Via Self-Control	Direct Effects Via Peer Associations	Direct Effects Via Perceptions of Fairness	Total Effect on the Change in Total Deviance Between the 3 and 9 Month Follow-Up
Age	-0.007*	-0.013**	-0.006✝	-0.022✝
Gender (male = 1)	-0.092	0.013	-0.03	-0.4
Race (white = 1)	-0.108✝	-0.04	0.03	-0.555*
Age at first arrest (< 19 years = 1)	-0.216***	-0.107	-0.132✝	-0.112
Divorce Status (yes divorced = 1)	-0.053	-0.058	-0.023	0.004
School Status (dropped out of school = 1)	0.188***	0.213*	0.034	0.107
Treatment Condition (CBM = 1)	-0.043	-0.06	-0.404***	-0.487*
Average number of minutes for individual sessions with parole officer	0.002	0	-0.002	-0.008
Average individual sessions per month with parole officer	0.027	0.002	-0.023	0.023
Average number of minutes for individual sessions with treatment counselor	0	0	-0.002*	-0.005
Average individual sessions per month with treatment counselor	-0.004	-0.019	-0.005	0.051
Peer-Association			0.001	-0.037
Self-Control			0.025	-0.334
Perceptions of Fairness				-0.666**

p < 0.10 ✝
p < 0.05*
P < 0.01**
p < 0.001***

In the next step of the decompositional analysis, the researcher examined how the control variables directly effect the latent factors, specifically, by examining which control variables are strongly associated with which latent factors and how these relationships directly impact the measurement of deviance at both the 3 and 9 month follow-up periods and the change in deviance between those periods. The full structural model describes the direct and indirect relationships that have been theoretically specified to explain post-treatment deviance at both the 3 and 9 month follow-up periods. Tables 6.03 to 6.05 revealed the significant relationships that exist between control variables and theoretically specified latent constructs.

In tables 6.03 to 6.05, the full structural model for total deviance at the 3 and 9 month follow-up, as well as, the change in deviance between the 3 and 9 month follow-up periods reveals that age, race, age at first arrest, and school status have significant and strong effects on the self-control latent construct. More specifically, it was found that increases in age, being white, being arrested before the age of 19, and not dropping out of school are significantly associated with having higher levels of self-control. The full structural model reveals that age and school status had significant effects on the peer-associations latent construct.

More specifically, it was found that decreases in age and having dropped out of school are associated with increases in negative peer-associations. The full structural model reveals that age, age at first arrest, treatment condition, and average number of minutes for individual sessions with the treatment counselor had significant and strong effects on perceptions of fairness. Also, increases in age, being arrested before the age of 19, being randomized to the Collaborative Behavioral Management intervention, and increases in the average number of minutes with the treatment counselor are significantly associated with decreases in perceptions of parole officer/ treatment counselor fairness. Therefore, the CFA reveals that a limited selection

of the control variables, particularly, age, age at first arrest, and school dropout status indirectly effect post-treatment total deviance at both the 3 and 9 month follow-ups, as well as, the change in deviance between the 3 and 9 month follow-up periods via the latent theoretical constructs. However, the results from the decompositional analysis of the CFA findings should be interpreted with caution due to CFI and RMSEA indicating this model does not adequately fit the data.

The findings from the series of CFAs and decompositional analyses conducted in chapter 6 indicates that there is a weak or non-existing relationship between low self-control and post-treatment deviance measured at the 3 and 9 month follow-up periods. Instead, control variables such as age, race, age at first arrest, and dosage levels are the strongest of predictors of post-treatment total deviance at both the 3 and 9 month follow-up periods. These findings highlight the limitations of the theoretically specified low self-control factor structure for predicting post-treatment total deviance outcomes for parolees. Furthermore, the model does not satisfactorily fit the data and requires substantial ad hoc modifications to the model structure, which previous research deems as an anti-theoretical approach to achieving model fitness (Piquero and Rosay, 1998). Therefore, this study will forego modifying the initial theoretically specified CFA model structure discussed in chapter 4. Instead, this study attributes the poor fit of the model to the data as being a result of Gottfredson and Hirschi's (1990) low self-control theory lacking internal and construct validity, particularly when examining data collected from parolees participating in a randomized controlled trial. Significant theoretical refinement of low self-control theory is required if it is going to continue being posited as a general theory of crime, particularly for explaining and predicting post-treatment outcomes of parolees.

Chapter 7

Summary and Conclusions

Summary of the Study and Findings

This dissertation tested Gottfredson and Hirschi's (1990) low self-control theory and its relationship with post-treatment outcomes by conducting a secondary-data analysis of a randomized controlled trial on parolees (n=569) called the Step'n Out study (2005). The Step'n Out study (2005) compared the results of a control group (standard parole) with an experimental treatment for parolees called the Collaborative Behavioral Management (CBM) intervention which was designed to improve substance-use treatment outcomes, reduce drug use, and reduce recidivism for parolees participating in the study (Friedmann et al., 2008; Friedmann et al., 2009; Friedmann et al., 2012). The CBM intervention utilized the principles of instrumental learning and social learning theory for shaping parolee behavior by providing incremental rewards for pro-social behaviors and graduated punishments for behaviors that increase risk for recidivism and substance use (Friedmann et al., 2005).

Low self-control theory states that individuals with character traits that are impulsive, risk-seeking, self-centered, display volatile temper, and have preferences for simple and physical tasks have a high likelihood of engaging in criminal activities and analogous behaviors (i.e. risky sexual practices). Gottfredson and Hirschi's (1990) theory makes the assumption that these traits are the result of parental socialization practices, are not able to be changed after the age of 8 or 10, the traits are stable across time, and the traits are predictive of future criminal behavior. In order to measure low self-control for the present study, an exploratory factor analysis was conducted on 20 self-report items collected at intake from the parolees in the study and a unidimensional measure of low self-control was constructed.

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Based on low self-control theory, this study hypothesized that parolees who self-reported engaging in substance use, recidivism, and analogous behaviors after the end of the treatment intervention at the 3 and 9 month follow-up periods will have low self-control traits (measured at intake). Also based on the theory, this study hypothesized that the treatment condition (control group vs. CBM group) will not moderate the relationship between low self-control traits and post-treatment outcomes. The exploratory results from this study were reported using univariate, bivariate, and exploratory multivariate statistics. A confirmatory factor analysis was also conducted to measure the direct effects of low self-control, peer-associations, and perceptions of fairness on post-treatment outcomes.

This study disaggregated various types of post-treatment behaviors (substance use, recidivism, and analogous behaviors) by examining self-reported engagement in these activities at the 3 and 9 month follow-up periods and their relationship to the unidimensional low self-control factor. This study also aggregated and combined the substance use, recidivism, and analogous behaviors variables to create a single variable measured at both the 3 and 9 month follow-up periods which were labeled as total deviance. The results from the exploratory multivariate and confirmatory factor analyses conducted in this dissertation study largely indicate that when post-treatment outcomes are disaggregated, parolees across the self-control spectrum (low to high levels of self-control) are engaging in post-treatment outcomes (substance use, recidivism, and analogous behaviors) at the 3 and 9 month follow-up periods even when statistical adjustments for age, gender, race, age at first arrest, education status, dosage levels, and treatment condition are controlled for in the models.

The results from the multiple regression analysis did not find any relationship between low self-control and perceptions of fairness. Also this study found no evidence that the treatment

intervention moderated the relationship between low self-control and post-treatment outcomes. Therefore, based on the findings from this study, low self-control theory does not allow researchers to understand the causal mechanisms by which post-treatment outcomes occur for parolees. Although, previous research has demonstrated that there is a normal distribution in the low self-control scores among individuals with criminal records and that these scores predict risk for recidivism and parole failure, this dissertation study was unable to demonstrate parallel findings (Langton, 2006). This study suggests that more theoretical refinement of low self-control theory or alternative theories are needed in order to explain the post-treatment outcomes of parolees participating in the Step'n Out study randomized controlled trial.

Although, in this study low self-control theory was unable to predict a majority of the post-treatment outcomes and perceptions of fairness factor score, there were three particularly interesting findings that also have strong public policy implications. The first major finding was from the bivariate analyses section of this dissertation which indicated that parolees that self-reported physically or verbally threatening someone at both the 3 and 9 month follow-up periods had statistically significant levels of low self-control compared to parolees who did not physically or verbally threaten someone. The second finding for this study found statistically significant mean differences in low self-control for the aggregate measure of recidivism at both the 3 and 9 month follow-up periods. The third major finding from the bivariate analyses section of this dissertation indicates that parolees that self-reported engaging in any form of deviance at the 9 month follow-up had moderately statistically significant lower levels of self-control compared to parolees who did not self-report engaging in any deviant behaviors.

Although, these findings were significant at the bivariate level, the relationship between low self-control and these outcomes largely disappeared when introducing statistical adjustments

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controlling for socio-demographic, risk, and treatment/dosage variables into the multivariate models. Therefore, more data and further research is required in order to understand the relationship between low self-control traits and post-treatment outcomes among parolees participating in a randomized controlled trial designed to reduce drug-use and other high-risk behaviors that may result in parole revocation.

Study Contributions

This study made significant contributions to understanding the generalizability and internal validity of Gottfredson and Hirschi's (1990) low self-control theory when tested using post-treatment outcome data collected from parolees participating in a treatment intervention (Friedmann et al., 2008; Friedmann et al., 2009; Friedmann et al., 2012). Although, the parolees (n = 569) that were selected to participate in the Step'n Out study (2005) had been identified as having a moderate to high-risk for recidivism measured using the Lifestyle Criminality Screening Form (LSCF) and a history of drug dependence measured using the Texas Christian University Drug Screen II (TCU Drug Screen II); this study found that there was a normal distribution in self-reported levels of self-control (Figure, 4.01). The normal distribution of self-control among parolees replicates what has been previously found in research conducted by Langton (2006) and discussed by Hirschi and Gottfredson (2000).

However, the findings from this dissertation study largely contradict Gottfredson and Hirischi's (1990) overarching claims about the generalizability and internal validity of low self-control as being the primary explanatory variable and cause of criminal and analogous behaviors. This study found that when using bivariate analyses, parolees across the self-control spectrum (low to high) were engaging in behaviors that can be subcategorized as substance use, recidivism, and analogous behaviors. Although it is important to note that t-tests revealed that

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parolees who self-reported physically or verbally threatening someone at both the 3 or 9 month follow-up periods had statistically significantly lower mean self-control scores compared to parolees who did not self-report physically or verbally threatening someone, this finding remains anomalous when considering that over 18 other variables related to substance use, recidivism, or analogous behaviors were tested and did not yield similarly statistically significant differences in self-control. Also, it is important to note that these statistically significant differences in levels of self-control when comparing parolees who physically or verbally threatened someone disappeared when analyzed using logistic regression models that had statistical adjustments controlling for socio-demographic, risk-factors, treatment conditions, dosage effects, and peer-associations variables.

Using aggregate measures (combined variables) of self-reported substance use and analogous behaviors at both the 3 and 9 month follow-up periods this study produced results that ran contrary to Gottfredson and Hirschi's (1990) general theory of crime. More specifically, there were not statistically significant differences in mean levels of self-control between parolees who did and did not self-report engaging in those post-treatment outcomes. However, in support of low self-control theory, the aggregate measures of recidivism at both the 3 and 9 month follow-up periods using bivariate analyses did yield moderate to statistically significant results that are aligned with the theoretical propositions stated in Gottfredson and Hirschi's (1990) low self-control theory.

The aggregate measure that combined all the variables across the post-treatment outcomes (substance use, recidivism, and analogous behaviors) was labeled total deviance and it was measured at both the 3 and 9 month follow-up periods. Bivariate analysis revealed that at the 9 month follow-up period, parolees who self-reported engaging in total deviance had moderately

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significantly mean lower self-control scores compared to parolees who did not self-report

engaging in any total deviance. This finding is aligned with Gottfredson and Hirschi's (1990)

low self-control theory, which specifically argues that individuals who participate in deviant

behaviors are the same individuals who have low self-control traits. However, the effects of self-

control disappeared when using a logistic regression model with control variables.

The second research question of this dissertation study examined whether the treatment

intervention, Collaborative Behavioral Management (CBM), moderated the relationship between

low self-control measured at intake and the post-treatment outcomes measured at the 3 and 9

month follow-up periods. The results from this dissertation did not produce any statistically

significant results that suggest an interaction between parolees having low self-control levels and

being randomized to the CBM intervention reduces post-treatment outcomes. Therefore, this

study concludes that the experimental intervention does not moderate the relationship between

low self-control traits and post-treatment outcomes.

Also, the multivariate logistic regression models do replicate previous research results

published by Friedmann et al. (2012) that there is a statistically significant main effect of being

randomized to the Collaborative Behavioral Management intervention that does moderately to

statistically significantly reduce the odds of engaging in post-treatment outcomes related to

alcohol use, crack use, number of nights in jail, and physically or verbally threatening someone

at the 3 month follow-up period. At the 9 month follow-up period, the main effect of being

randomized to the CBM intervention moderately to statistically significantly reduced the odds of

engaging in heroin use and total number of days incarcerated. These findings demonstrate that

the CBM intervention is a moderately effective treatment for reducing serious drug use among

parolees who have crack and heroin dependence, but has virtually no effect on reducing drug use

among parolees with marijuana and powdered cocaine dependence. Although, when controlling

for dosage it remains unclear whether the surveillance component or the treatment aspect of the

CBM intervention effected post-treatment substance use and recidivism outcomes. Further

research is needed to understand the effectiveness of the CBM intervention paradigm and how it

may differ in its implementation, approach, and capacity for providing substance use treatment to

parolees compared to existing treatment methods.

Finally, a key finding from the confirmatory factor analysis (CFA) "effect

decompositional analysis" in chapter 6 reveals that age, race, and dosage are statistically

significant predictors of deviance at the 9 month follow-up. Race had the strongest effect on

deviance at the 9 month follow, more specifically, being racially categorized as white

statistically significantly decreased participation in deviant behaviors related to substance use,

recidivism, and/or analogous behaviors. These findings provide a confirmation of the extant

literature that age, race, and treatment dosage levels consistently effect post-treatment outcomes

(Tittle et al., 2003; Pager, 2003; Trimbur, 2009; Sung and Chu, 2011). The CFA did not indicate

that self-control, peer-associations, and perceptions of fairness measures had any effects on the

measurement of deviance at the 9 month follow-up.

Ethical Implications

This dissertation study utilized publicly available secondary-data from the Step'n Out

study (Friedmann et al., 2005) that is available through the Inter-university Consortium for

Political and Social Research (ICPSR). This study was reviewed by the Human Research

Protections Program (HRPP), Institutional Review Board (IRB), at the City University of New

York (CUNY), Brooklyn College, for its ethical implications and potential for causing harm to

the research participants whose data was involved in the study. The IRB status certificate for this

study (in appendix, figure 7.01) indicated that this dissertation study's secondary-data analysis and reporting of results from the Step'n Out study data is exempt from IRB approval because it was not involved in the collection of data from prisoners, adolescents, and other federally protected groups.

The Step'n Out study data that is available through ICPSR was deidentified for any identifying information in order to protect the research participants' confidentiality. The recoded data for this study's secondary data analysis of the Step'n Out study data will be secured on a password protected computer and all data will be only accessible to the principal investigator of the study. If any identifiable information is found, the Principal Investigator of this study will immediately contact the staff at ICPSR and the CUNY IRB. There is no expected duration of subject participation because the data has been previously collected, deidentified, and uploaded on to ICPSR for general access to the scholarly community. Therefore, the risk of potential for harm is minimal to non-existent for the research participants of the Step'n Out study.

Policy Implications for Criminological Theory and Parolee Rehabilitation

This dissertation study was primarily interested in understanding the relationship between parolees' levels of self-control measured at intake in the Step'n Out study (Friedmann et al., 2005) and their post-treatment outcomes related to substance use, recidivism, analogous behaviors, and total deviance. The extant literature and empirical tests of Gottfredson and Hirschi's (1990) low self-control theory have demonstrated with moderate to statistically significant results that the uni- and/or multi-dimensional measures of low self-control are predictive of criminal and analogous behaviors (Grasmick et al., 1993; Arneklev et al., 1999; Vazsonyi et al., 2001; Baron, 2003; Delisi et al., 2003; Vazsonyi and Crosswhite, 2004; Longshore et al., 2004; Delisi and Berg, 2006; Langton, 2006; Conner et al., 2009). Grasmick et

al. (1993) self-control scale was tested using predominantly white individuals with no criminal history, which led to a number of methodological criticisms of their scales validity and reliability. Piquero et al. (1998) research provides evidence to support the reliability and validity of the Grasmick et al. (1993) self-control scale when looking at varying demographic groups that include non-white and drug-using research subjects. Piquero et al. (1998) found that self-control is predictive of future criminal behavior across the criminal and the general population.

However, there exist an equally comparable number of empirical studies and theoretical critiques of self-control that suggest that low self-control is a weak predictor of institutional misconduct, criminal, and analogous behaviors (Akers, 1991; Geis, 2000; Cretacci, 2008; Delisi et al., 2010). Studies with findings that run contrary to Gottfredson and Hirischi's (1990) theory often posit that micro-level characteristics such as gender, psychiatric disorders, prior delinquent and criminal offenses, and age are able to explain a greater proportion of the variance in criminal behavior rather than the uni- and multi-dimensional constructs of low self-control (Delisi et al., 2010). Akers (1991) has strongly argued that the theoretical assumptions underlying low self-control theory are similar to the concept of differential reinforcement taken from social-learning theory, because Gottfredson and Hirschi (1990) states that "crime is caused or prevented by constellations of pleasurable or painful consequences." Akers (1991) argues that this statement in particular highlights the negative and positive reinforcement aspects of engaging in crime, rather than criminal behavior being related to personality characteristics.

Another major criticism leveled at low self-control theory by Akers (1991) is that Gottfredson and Hirschi (1990) theoretical assumptions are tautological, because the predictor, criminal propensity (i.e. low and high self-control), cannot be separated from its outcome, engagement in crime. Akers (1991) states that "low self-control explains both the stability and

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versatility of crime" (p. 203). Therefore, according to Akers (1991), Gottfredson and Hirschi (1990) argue that stable individual-level differences in criminal behavior are related to low self-control and that Gottfredson and Hirschi also argue that crime and analogous behaviors are the result of low self-control. Akers (1991) argues that the testability of the stability and versatility of self-control theory does "not define self-control separately from propensity to commit crimes (p. 203-204)."

Reisig et al. (2011) found that low self-control was a robust predictor of criminal behavior, but also indicates that a large percentage of the variation in criminal behavior is unexplained. In order to account for the unexplained variance in criminal behaviors, Reisig et al. (2011) found evidence to suggest that perceptions of procedural fairness/legitimacy of the criminal justice system may be a greater predictor of criminal behavior than low self-control measured uni- and multi-dimensionally. Therefore, the primary finding from the research conducted by Reisig et al. (2011) states that the research participants' perceptions of legitimacy is inversely related to criminal offending.

Reisig et al. (2011) discusses how their findings have major public policy implications, particularly, because their findings contradict the conventional wisdom which "has long held that legal authorities can do little, if anything, to influence crime patterns. Addressing crime-causing factors, critiques argue, is beyond the reach of the criminal justice system. Admittedly, it is probably the case that justice officials can do little to alleviate poverty, curb family, disruption, or reduce the behavioral effects of latent traits such as the warrior gene (p. 1276)." The conventional wisdom that Reisig et al. (2011) are referring to dates back to the criminological literature of Wilson (1985), who similarly argued, that the justice system cannot influence crime

patterns through social interventions and instead argued in favor of punitive sentencing as a deterrence and viable solution to decreasing crime rates.

In the same vein, Martinson's (1974) research on "what works" demonstrated that very few, if any, criminal justice interventions that emphasized philosophies of rehabilitation, education, and substance abuse counseling were effective at reducing rates of recidivism among offenders. However, accumulating empirical evidence strongly suggests that the criminal justice system can in fact influence crime rates and decrease crime patterns through interventions that incorporate evidence-based practices that target high-risk offenders and treat their criminogenic risk-factors (Cullen and Gendreau, 2000; Cullen et al., 2009). Also, research demonstrates that emphasizing practices that promote procedural justice can effectively reduce offender cynicism and recidivism (Reisig et al., 2011).

Reisig et al. (2011) states that recent research evidence suggests policing and criminal justice interventions that incorporate theories such as situational crime prevention and social learning to decrease violent behavior (Braga and Bond, 2008) or psycho-social interventions with a focus on mental health (Chintakrindi et al., 2013) through community case-management have the potential to increase perceptions of legitimacy of the justice system for those offenders undergoing the intervention and decrease their relative risk for recidivating. Based on the assumptions of procedural justice theory (Tyler, 2003), criminal justice interventions that seek to alter the offenders' perceptions of fairness and legitimacy in a favorable direction that aligns with the criminal justice authorities enforcement goals, can also reduce future recidivism among offenders. The relationships between offenders' perceptions of fairness/legitimacy of criminal justice authorities and rates of recidivism have been found to be inversely related. Therefore, recent evidence demonstrates that it is possible for the justice system to reduce the rates of

recidivism of those individuals that are under their supervision, by shaping their perceptions of fairness via the intervention(s).

Evidence from this dissertation did not find a relationship between parolees' self-control and perceptions of fairness measured at the 3 month follow-up period. This study found that the correlation between low self-control and the unidimensional measure of perceptions of fairness factor score was extremely weak, r = 0.006, p > 0.05. This finding runs contrary to the theoretical assumptions of Gottfredson and Hirschi's (1990) low self-control, because the theory would argue that parolees with lower levels of self-control would more likely to self-report lower levels of perceptions of fairness compared to parolees with higher levels of self-control. Gottfredson and Hirschi (1990) theorize that individuals who demonstrate low self-control would be unable to successfully complete any sort of criminal justice intervention, regardless of whether it is incarceration or a reentry rehabilitation intervention, because low self-control traits preclude the management of social relationships that are requisite for navigating punishment and intervention goals. Individuals with low self-control are thus less likely to perceive any criminal justice interventions as fair, because they have a high probability of failing the intervention and recidivating due to the assumption of trait stability.

The evidence from the Step'n Out study (2005) data demonstrates that parolees across the self-control spectrum had varying degrees of perceptions of fairness. Therefore, this study concludes that there is no relationship between low self-control and perceptions of parole officer/counselor fairness for parolees participating in the Step'n Out study. However, in the multivariate regression model (table 5.16) that examines the outcome factor for perceptions of fairness, there was a statistically significant controlling effect for gender, treatment counselor dosage, and random assignment to the treatment condition. Males were found to be less likely to

perceive their participation in the Step'n Out study as procedurally fair, compared to females. Increases in dosage of average number of minutes for individual sessions with the treatment counselor were found to inversely effect perceptions of fairness. Being randomly assigned to the experimental Collaborative Behavioral Management intervention was found to decrease perceptions of fairness.

The finding related to being male and decreased perceptions of fairness in this study is more than likely related to the differential compliance in treatment by gender discussed by Kempf-Leonard and Sample (2000) in their article exploring gender-disparity in treatment interventions. Johnson et al. (2011) exploration of the Step'n Out study data similarly found that males were more likely to engage in post-treatment drug use, compared to females even when controlling for drug type. Although limited empirical research exists on gender-disparity in post-treatment outcomes, this study contributes to the extant literature that gender and perceptions of fairness are inextricably linked for parolees, but are unrelated to levels of self-control, which is theoretically damaging to the internal validity and generalizability of low self-control theory.

Based on the t-test results, in the bivariate analysis section of chapter 5, which demonstrated that there was not a statistically significant difference in levels of self-control between the Collaborative Behavioral Management intervention and the standard parole (control) group, this study hypothesized that parolees who exhibited low self-control that were randomized to the CBM intervention would have higher perceptions of fairness compared to parolees with low self-control who were randomized to the standard parole control group, because the CBM intervention was specifically designed to enhance the therapeutic relationships between parolees, parole officers, and treatment counselors. This study assumed that the experimental CBM intervention would have a larger and more positive effect on perceptions of

fairness for parolees with low self-control compared to parolees with low self-control in the control group. The specific moderating hypothesis was that the CBM intervention would moderate the relationship between low self-control measured at intake and perceptions of fairness measured at the 3 month follow-up period. A moderating effect for the treatment condition was not found between low self-control and perceptions of fairness.

These findings demonstrate that the CBM treatment intervention did not moderate the relationship between low self-control measured at intake and both the perceptions of fairness of parolees and their post-treatment outcomes. This study will present and discuss three possible reasons why a moderating effect between low self-control and the treatment intervention was not observed in any of the exploratory multivariate analyses and confirmatory factor analysis models when measuring post-treatment outcomes and perceptions of fairness. The three reasons that will be discussed ahead include (1) the fact that parolees who engaged in post-treatment outcomes had low self-control scores across the self-control spectrum, (2) the quality and quantity of CBM dosage was limited in its ability to reduce criminogenic risk-factors, and (3) racialized social structural obstacles prevent effective reentry.

The first reason why a moderating effect was not observed is because Gottfredson and Hirschi (1990) explicitly state that "Given the ineffectiveness of natural learning environments in teaching self-control, we would not expect the artificial environments available to the criminal justice system to have must impact (p. 269)". Based on the assumptions of low self-control, the theorists would argue that the parolees in the present study who have been measured as having low self-control traits will continue to engage in criminal activity and have decreased perceptions of fairness of their treatment intervention, even when being randomized to a treatment

intervention (e.g. Collaborative Behavioral Management) that explicitly attempts to manage and reduce parolee risk for recidivism.

The second reason why a moderating effect was not observed is likely due the length and quality of the treatment dosage. The Step'n Out study was a 12 week experiment that compared two treatments through a randomized control trial. The experimental treatment intervention in this study, the Collaborative Behavioral Management (CBM) intervention, attempted to develop therapeutic relationships between the parolee, parole officer, and treatment counselors through role induction techniques, principles of operant conditioning, and weekly team meetings between all parties with the intention of altering and reducing the parolees' lifetime of learned substance use, criminal, and analogous behaviors.

However, the research design protocol for the Step'n Out study (Friedmann et al., 2005) does not explicitly discuss utilizing a structured cognitive-behavioral therapy (CBT) treatment intervention to change parolee behavior and thinking patterns. CBT has been reliably demonstrated to be the most effective technique for altering parolee behavior and thought processes through a structured intervention. The lack of a structured CBT intervention within the larger CBM intervention is alarming, especially, considering the vast amounts of empirical research and literature supporting its effectiveness at reducing recidivism when compared to other punishment and treatment styles (Lipsey and Cullen, 2007; Latessa 2008; Taxman, 2011). It can be concluded that the CBM intervention sought to efficiently increase parolee treatment compliance and reduce post-treatment outcomes by dispensing with a high quality structured CBT intervention protocol and ignoring the criminogenic needs that are known to lead to criminal behavior (Andrews, 1995).

Latessa (2008) argues that effective correctional interventions target crime-producing factors ("criminogenic" needs) through cognitive-behavioral therapeutic techniques that target anger, attitudes, beliefs, peers, substance use, and values. Also, Latessa (2008) states that empirical evidence repeatedly demonstrates that family-based interventions need to complement individual rehabilitation treatment for parolees, in order to effectively reintegrate the parolee into the larger community from which they originate from, or else, the parolee risks cycling through the revolving doors of the criminal justice system, because alone parolees cannot manage navigating the social, financial, and bureaucratic labyrinths of the reentry process (Barnes-Ceeney, 2013).

Steadman (1992) recommends that program staff involved in the rehabilitation treatment of correctional involved individuals act as 'boundary spanners' by providing a multifaceted array of acute services that included navigating the referrals and admission process to mental and physical health services, substance abuse treatment services, supportive-housing programs, and by providing supportive counseling. Had the CBM intervention included social-workers and peer-specialists, in addition to the parole officers and substance-use counselors to help facilitate the transition of parolees from the prison environment back into the community, through assisting parolees with referrals and gaining access to entitlements such as health care and financial assistance, arguably greater reductions in post-treatment outcomes may have been observed (Chintakrindi, 2013).

Mellow and Christian (2008) state that the five most common issues that prisoners have to confront when reentering society include "(1) finding a job (2) needing money (3) transportation problems (4) needing training or education to get a job or a better job and (5) problems getting a wardrobe." However, there is often very few if any instructional material

available for literate parolees when exiting prison. The researchers conducted a content analysis of reentry guides and determined that discharge planning reentry guides is an essential component for facilitating the successful reentry of parolees. However, Mellow and Christian's (2008) analysis found that the available reentry guides that were published for assisting parolees with navigating the reentry process were often outdated, unavailable, or extremely lengthy and complicated. Their results suggest that the discharge planning process should be based on empirical evidence and guided by researchers. The CBM intervention relied heavily upon social and material incremental rewards and graduated sanctions to shape parolee behavior in a socially and legally acceptable direction, rather than guiding the parolees through the reentry process through structured discharge planning and instructional material (Mellow and Christian, 2008).

As well intentioned as the Step'n Out study is in its emphasis on applying role induction, experimental principles of behaviorist psychology, and collaborative alliances to build therapeutic relationships in order to reduce recidivism, it can be argued that a core flaw in the CBM design is that the length of treatment is only 12 weeks long. Seiter and Kadela (2003) state that the optimal treatment duration for success in therapeutic communities is 9 to 12 months long. Therapeutic communities (TC) were designed for prisoners who were seeking to be rehabilitated and eventually released onto parole. While the TC participants were actively involved in the therapeutic communities intervention it was found to be effective at reducing recidivism and it continued to have positive effects, as long as, the participant remained active in receiving the intervention. However, recidivism would increase after 12 months, if the prisoner was repeatedly denied parole. Seiter and Kadala (2003) state that the frustration of being denied parole causes the parolee to reduce involvement in the TC and inevitably regress back to previous behaviors.

Similarly, parolees out on parole who are repeatedly denied integration into the community and an opportunity to be self-sufficient through job and housing placements begin to reject the norms of the larger social structure. Negative credentials (e.g. criminal record and substance use history) and lack of education/skill often times produce feelings of hopelessness and cause parolees to revert to criminal behaviors and substance use to cope with their social and economic conditions (Pager, 2003). Therefore, a 12 week intervention will most likely only reduce criminal behaviors for only 12 weeks, and not as a result of the intervention design, but most likely because of the punitive punishment outcomes associated with increased surveillance from parole officers and substance use counselors which deter the parolees from making any negative or risky decisions that may threaten their reentry in the community.

The CBM treatment intervention design protocol and length of treatment reflects a larger critique of the state of reentry that was presented by Travis (2000) who states that criminal justice scholars need to think critically about deconstructing risk for recidivism and substance use relapse. The CBM treatment design takes a step in the right direction by addressing parolee risk for recidivism through structured and collaborative drug treatment, but its length of treatment is extremely flawed, because relapse for alcohol and drug addicts is primarily a life-long public health issue that the criminal justice system cannot monitor for only 12 weeks and then release the parolee on their own recognizance, as they are forced to deal with their drug problems on their own.

After the experimental CBM intervention ends, eventually the parolee will be returned to regular parole to fulfill the duration of their sentence. Regular parole has procedures that have strict zero-tolerance policies for failed drug-tests that can result in parole violations and being returned to prison. Therefore, a 12 week design may seem generous to criminal justice

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administrators to assist parolees with their drug related issues, but 12 weeks is not enough dosage or time for resulting in any long-term residual or observable changes in the parolees behavior and thought patterns. Travis (2000) states "People who have been sober for decades still identify themselves as alcoholics who take sobriety a day at a time."

Finally, the third reason why this dissertation study failed to observe a moderating effect between the low self-control factor and the treatment intervention on post-treatment outcomes and perceptions of fairness is strongly related to what Trimbur (2009) describes as "racialized social structural obstacles". Trimbur (2009) spent an extended period of years embedded among current and former parolees while training in the art of kick-boxing at a gym in Brooklyn, New York. The researcher conducted countless structured and unstructured interviews in order to gain a concrete understanding of the contextual social, racial, and political factors that effect parolee behavior during the post-prison reentry process.

Trimbur (2009) states that it is common among correctional scholars to understand and attribute rehabilitation success through "how much?", "how many?", and "how long?" do parolees forfeit their criminal behavior, instead of tackling the deeper question of why would a person return to criminality given the opportunity of being released into the community? Trimbur (2009) states "Understanding reentry only through the lens of desistance misses the insight of men who are not trying to "go straight" and the complex rationale behind their analyses of legality and criminality as well as the insight of men who try to avoid reengagement with crime yet become frustrated when they crash up against the realities of their material conditions. Thus the lens of desistance obfuscates the heterogeneity of experiences of reentry and former prisoners' interactions with, understandings of, and critiques of racialized social structures".

Racialized social structures can be deconstructed and defined as what Wacquant (2001) has described as "prison is remaking 'race' and reshaping the citizenry (p. 116)." According to Wacquant (2001) the prison and larger criminal justice system are 'race making' institutions that create and divide groups, not simply through ethno-racial divisions, but through the process of producing disparities in economic, political, social, and cultural structures by what he describes as the "manifold effects of the wedding of ghetto and prison into an extended carceral mesh, perhaps the most consequential is the practical revivification and official solidification of the century-old association of blackness with criminality and devious violence (p. 117)." Wacquant (2001) concludes that being labeled a criminal by the justice system essentially relegates and castes an individual as being black or what African-Americans had experienced throughout a majority of American history, being treated as subhuman and prohibited from accessing economic, political, and social opportunity that were historically only afforded to Caucasians.

To support his claims, Wacquant (2001) cites how prisoners and former prisoners, regardless of race or ethnicity, are denied access to cultural and intellectual capital in the United States by being ineligible for Pell Grants that fund higher-education, even when empirical evidence has reliably demonstrated that prisoners with higher-education demonstrate significant reductions in recidivism. Wacquant (2001) also gives the example of how prisoners in numerous states across the United States are prevented from participating in the social redistribution of public aid (e.g. welfare, government housing, and food stamps), particularly, in a time period of uncertain economic stability and limited post-industrial service occupational opportunities, where the primary solution is to obtain a higher education in order to increase the probability for occupational stability, career advancement, and property ownership.

Gottfredson and Hirschi's (1990) low self-control theory, does not align with what

Trimbur (2009) found as the rationale for explaining post-prison criminality, in terms of deeply

constructed racialized social structural obstacles that prevent former prisoners from developing

self-sufficiency via legitimate economic means. In particular, this dissertation study found that

engagement in criminal behavior runs across the self-control spectrum for the parolees involved

in the Step'n Out study when disaggregating post-treatment total deviance outcomes into the

varying substance use, recidivism, and analogous behavior variables. Gottfredson and Hirschi

(1990) argued that criminality is trait stabilized and originates from family socialization

practices, rather than acknowledging that an individual's criminal behavior has historical,

political, economic, racial, and socio-demographic foundations that are intricately wedded with

social-policies. Wacquant (2000) argues that the criminal justice system, in particular,

incarceration is designed to produce stigma, constraint, territorial confinement, and institutional

encasement. Therefore, once an individual, such as the research participant's in the Step'n Out

study, were initially exposed to prison, they had already become ostracized from the larger

mainstream society by having their political rights, civil liberties, family bonds, and economic

opportunities stripped from them; no amount of post-prison rehabilitation or reentry

interventions focusing on substance use and collaborative treatment can undue the initial stigma

branded on to the prisoners.

Wacquant (2000) and Trimbur (2009) would concurringly argue that the post-treatment

outcomes from the Step'n Out study as measured through Gottfredson and Hirschi's (1990) self-

control theory, hides the historical and racialized social structures that perpetuate criminality and

class division, because self-control theory only focuses on personality characteristics, which fails

to indict what Trimbur (2009) describes from her interview experiences with parolees as the

"shared perception that the system cannot be relied upon to aid men as they reenter and that it is so profoundly broken that only people who go at reentry alone have any chance of success. The limitations of racial injustice and social conditions can be overcome, but only through acts of sheer will. In other words, where there is no support from the system, success is only possible through incredible individual action." Trimbur (2009) discusses how parolees have to overcome vast amounts of bureaucratic obstacles to obtain risk-mediating necessities such as exiting the shelter system, gaining access to private housing, social workers, substance use counseling, financial resources, and employment. With the insurmountable bureaucratic obstacles placed in front of parolees, particularly those with substance dependence, the ability to successfully reintegrate into society substantially diminishes and forces parolees "without a trust in that system, they take reentry upon themselves (Trimbur, 2009)." Taking reentry upon themselves can be interpreted as being synonymous with recidivating and relapsing into drug use, thereby increasing the formerly incarcerated individual's risk for reentering the prison system.

Until major reforms occur in the broader social, economic, and political domains of how the formerly incarcerated are reintegrated into society, particularly those with substance-use issues and histories of engaging in non-violent crimes; society will continue to observe the formerly incarcerated, regardless of their levels of self-control, continuing to engage in substance-use, recidivism, and risky-sexual practices that pose a threat not only to the health and welfare of the formerly incarcerated, but will continue to pose a threat to the public health and safety of the wider society.

The first steps in policy reform aimed at facilitating reentry for those facing criminal records, prison time, or criminal justice supervision is to reexamine the drug laws at both the federal and state levels that result in the vast majority of arrests and convictions occurring across

the United States. Mosher (2001) states that "In 1996, there were an estimated 1,506,200 arrests for drug offenses in the United States, translating to an arrest rate of 594.3 per 100,000 population. For the 50 U.S. cities with more than 250,000 population, drug arrest rates were higher than for any other crime category, at 1077.8 per 100,000 population (p. 84)." Although these statistics are alarming, a number of states at the present time have taken radical steps to counter the draconian drug-war policies and racially differential enforcement of drug laws that have encroached upon the civil liberties of U.S. citizens for well over half a century and which has had a disproportionally direct impact on the communities of low-income African-Americans and Hispanics.

Both Colorado State and Washington State have legalized cannabis for recreational sale and consumption for adults and it is also being regulated similarly to alcohol and cigarettes. At the present time a number of states have taken more moderate steps to decriminalize marijuana and regulate it as medicine for individuals suffering from terminal illnesses, severe disabilities, post-traumatic stress disorder, fibromyalgia, and countless other medical conditions. However, the federal government continues to maintain that marijuana is a schedule one narcotic, with high potential for abuse, and that it has no medical value.

Young (1971) argues that society does not benefit by broad sweeping legislation that treats all drugs as being homogenously harmful and addictive to individuals and the collective safety of society, because once an individual is convicted of a drug crime, their capacity to be self-sufficient economically and socially becomes hindered by the stigma of publically available criminal records. Instead, the categorization of drugs should be reexamined medically and legislatively, particularly marijuana, due its benign psycho- and social- pharmacological impact on individuals and society. Until reforms in drug policy occur at the federal level, society will

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continue to observe racial and class disparities in rates of convictions, sentencing, and probation and parole revocations (Porter et al., 2013).

Examples of nations with progressive drug policies include the Netherlands and Portugal. Netherlands has licensed private businesses to operate coffee shops where locals can consume marijuana, without fear of criminal prosecution by the law enforcement authorities. Portugal has taken a harm-reduction approach to managing individuals with drug addiction, particularly those with addictions to heroin, by legalizing personal amounts and providing drug treatment opposed to criminalizing addicts through incarceration. Both the Netherlands (123 per 100,000) and Portugal (128 per 100,000) cite some of the lowest rates of incarceration for industrialized nations, whereas, the United States (714 per 100,000) holds the highest incarceration rate in the world (Walmsley, 2005).

Porter (2013) reports that "Minorities, specifically Blacks and Hispanics, are overrepresented in prison and jails. As of the 2005, the rate per 100,000 for Whites stood at 412, Hispanics at 742, and for Blacks 2,289. This representation is mirrored throughout the Criminal Justice system and the statistics show that nowhere is this more pronounced than the probation system. Over half of the people under correctional control are on probation. As of 2005, this number was over 4 million, with about 840,000 being on parole and 2.25 million incarcerated." The findings from Porter's (2013) presentation lends empirical support to the fact that there exists a significant "racial/ethnic gap" in probation revocation across the four criminal justice sites that he examined. More specifically, that African-Americans and Hispanics had higher rates of revocation compared to Whites, even when controlling for criminal histories, risk assessment scores, and other socio-demographic characteristics.

Therefore, the only way to truly create a more equal and inclusive society that does not ostracize large swaths of the general population is for a paradigm shift to occur in drug laws, sentencing policies, and how individuals with drug-dependence, psychiatric illness, and/or histories of criminal behavior are managed by both the criminal justice system and public health agencies. Young (1971) states that "The roots of moral indignation must be publicly examined and understood. The vested interests of powerful groups and control agencies must be systematically exposed… It is not merely the drugtaker but the experts, politicians and general public who must change if we are to eliminate genuinely deleterious drug use from our society."

Limitations of the Study

This study had a number of limitations regarding how self-control theory was tested; in particular, for establishing generalizability and internal validity using the secondary data collected from the Step'n Out study (Friedmann et al., 2005). The major design limitation of this study was that the parolees who participated in the Step'n Out study were already screened for being moderate to high-risk for recidivism using the Lifestyle Criminality Screening Form (LCSF) measured prior to intake into the study. The LCSF utilizes four subscales related to assessing the degree to which an individual engages in a criminal lifestyle. The scales include measurements of irresponsibility, self-indulgence, interpersonal intrusiveness, and social rule breaking. Although the four subscales from the LCSF are focused on predicting risk for recidivism and target individuals with moderate to high-risk levels for participation in the Step'n Out study; the LCSF fails to target and identify personality characteristics that are theorized to be the result of socialization at an early age, assumed to be trait stabilized, and a general explanation for criminal and analogous behaviors (Gottfredson and Hirschi, 1990; Friedmann et al., 2005).

Research from this study found that even among parolees identified as being moderate to high-risk for recidivism using the LCSF at screening into the Step'n Out study, a normal distribution in levels of self-control emerges (figure 4.01); using 20 items from the intake questionnaire for producing a theoretically specified self-control factor to unidimensionally measure the characteristics of low self-control using items related to risk-seeking, impulsivity, self-centeredness, volatile-temper, and preference for physical and simple tasks (Gottfredson and Hirschi, 1990). Therefore, even among moderate to high-risk offenders, a normal distribution in self-reported levels of self-control is observed, which satisfies the normality distribution assumption for the numerous statistical tests used in this study.

The Step'n Out study (2005) was a randomized controlled trial that randomized parolees into either the Collaborative Behavioral Management (CBM) or into a control group (standard parole). In order to measure the post-treatment outcomes of parolee in this study, this research study controlled for the randomization that occurred during the methodological design stage of the Step'n Out study, by including treatment condition and measures of dosage levels with parole officers and substance use counselors in the exploratory and confirmatory multivariate models. Although, statistical controls were applied in this study, a major limitation is that there were large amounts of missing data at both the 3 and 9 month follow-up periods when attempting to measure self-reported engagement in substance use, recidivism, and analogous behaviors. Missing data analysis was conducted using dummy variable adjustment to indicate missing and non-missing, which was further explored through measuring the relationship between missing data and self-control scores.

Porter and Ecklund (2012) discuss how active non-responders with missing data provide valuable information about who is or is not willing to participate in answering controversial

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survey questions based on race, gender, class, personality characteristics, and other demographic variables. No statistically significant relationships were found between parolees who had missing data at both the 3 and 9 month follow-up periods and their levels of self-control. This finding demonstrates that parolees with missing data had varying levels of self-control which would not impact the analysis between non-missing data and self-control levels. Once missing data was analyzed, this study proceeded to impute missing data using regression based imputation for any missing data among the self-control items and other control variables measured at intake. This study avoided imputing missing data among the post-treatment outcomes because it would lead to unreliable estimates when examining the post-treatment outcome data. Parolees with missing data at the 3 and 9 month follow-up periods were list-wise deleted from the analyses.

Another, limitation for this study was the use of self-report data, particularly for measuring self-control and post-treatment outcome data. Although, the self-control items used to measure self-control were modeled after Grasmick et al. (1993) self-control scale, this study did not use a previously validated self-control instrument and was forced to construct a novel self-control unidimensional factor based on available data that was theoretically specified from Gottfredson and Hirschi's (1990) general theory of crime. The limitation in the validity of measuring self-control for this study was addressed through the content validity assessed by the dissertation committee of this study, who reviewed and approved the use of the 20 self-report items for measuring self-control. For post-treatment outcomes, drug-test and official criminal record data was available for the participants of the Step'n Out study (2005), but that data was challenging to decipher, recode, and subsequently analyze. Therefore, the researcher opted to use only self-report data collected at the intake, 3, and 9 month follow-up periods due to the uniformity, reliability, and validity of the CJ-DAT self-report forms.

Chan (2009) provides a list of numerous critical issues that are involved in the use of self-report data. For example, the researcher states that "self-report measures contain random measurement errors and they therefore do not have perfect reliability (p. 317)." Other researchers critically examining the reliability of self-report data have argued that self-report data is strongly susceptible to social desirability biases or "social approval" particularly when it is related to measurements of physical activity, mental health, and/or substance use (Welte and Russell, 1993; Adams et al., 2005). Welte and Russell (1993) discuss how research participants are less likely to admit, even when data is collected anonymously, unpopular or socially unacceptable behaviors, attitudes, and beliefs due to the fear of stigmatization and punishment that maybe involved if others find out. However, Chan (2009) qualifies his critical analysis of self-report data by stating that self-report data is not necessarily effected by the social desirability bias by stating "There is also evidence that self-report measures are less susceptible to social desirability responding when the accuracy of item responses is verifiable… In addition, the content of some personality, attitudinal, or workplace perception constructs are less likely to be susceptible to social desirability responding given the absence of any clearly desirable norm or standard with respect to the direction of the responses (p. 320)." Similarly, for the secondary data-analysis of the Step'n Out study (2005) data there is no reason to believe that the parolee self-report data was effected by the social desirability bias, because most of the data was verifiable for accuracy and there was no clearly expected norm for levels of self-control.

Finally, another major limitation of the statistical design of this study is the limited number of socio-demographic and risk variables that were controlled for during exploratory and confirmatory multivariate analyses. In particular, socio-demographic and economic variables related to employment status, housing conditions, monthly and annual finances, health insurance

coverage, gang involvement, religious orientation, and validated risk-assessment scores were not controlled for in the multivariate models. The limited number of cases in this study precluded entering of additional statistical controls, because the model would have been oversaturated and produced unreliable results. Therefore, the statistical controls that were included in this study were selected specifically due to the extant literature indicating that those variables have previously been demonstrated to be covariates of recidivism, substance use, analogous behaviors, and total deviance.

Future Research

Future research on self-control should continue to explore the relationship between post-treatment outcomes for parolees and their personality and behavioral characteristics measured at intake due to the relative theoretical and social policy implications involved when theorists (e.g. Gottfredson and Hirschi) claim to be in possession of a general theory of crime. A general theory of crime influences how criminal justice risk-assessments are developed and inevitably effect how suspected offenders are treated throughout all stages of the criminal justice system from suspected involvement in crime, arrest, conviction, sentencing, and reentry.

This study generally demonstrates that parolees across the self-control spectrum engaged in post-treatment outcomes related to recidivism, substance use, and analogous behaviors which contradict Gottfredson and Hirschi's (1990) low self-control theory. However, a caveat to this finding is that parolees who self-reported engaging in verbally or physically threatening behavior compared had statistically significantly lower levels of self-control compared to parolees who did not self-report engaging in physically or verbally threatening behaviors at both the 3 and 9 month follow-up periods. Therefore, it is critical that researchers continue evaluating whether low self-control theory may provide limited generalizability for predicting future aggressive and

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threatening behavior among parolees receiving a treatment intervention. Future research of low self-control theory should also examine whether uni- or multi-dimensional latent constructs of low self-control are more accurate at predicting post-treatment outcomes among parolees involved in randomized controlled trials.

Further research is also needed on understanding the relationship between parolees' perceptions of fairness about the treatment intervention, personality characteristics, and socio-demographic characteristics. It is possible that a third variable related to neighborhood context or social disorganization maybe adversely impacting the post-treatment outcomes of parolees. Perhaps sites located in economically and/or socially depressed areas amplify legally unacceptable behaviors. Therefore, closer examination of parolee post-treatment outcomes through hierarchical linear modeling is recommended especially if the data was collected from multiple sites, similar to what occurred in the Step'n Out study, which was a multisite randomized controlled trial.

Appendix

Figure 3.01. Consolidated Standard of Reporting Trials (CONSORT) Chart of Step'n Out Study Participation (Friedmann et al., 2012)
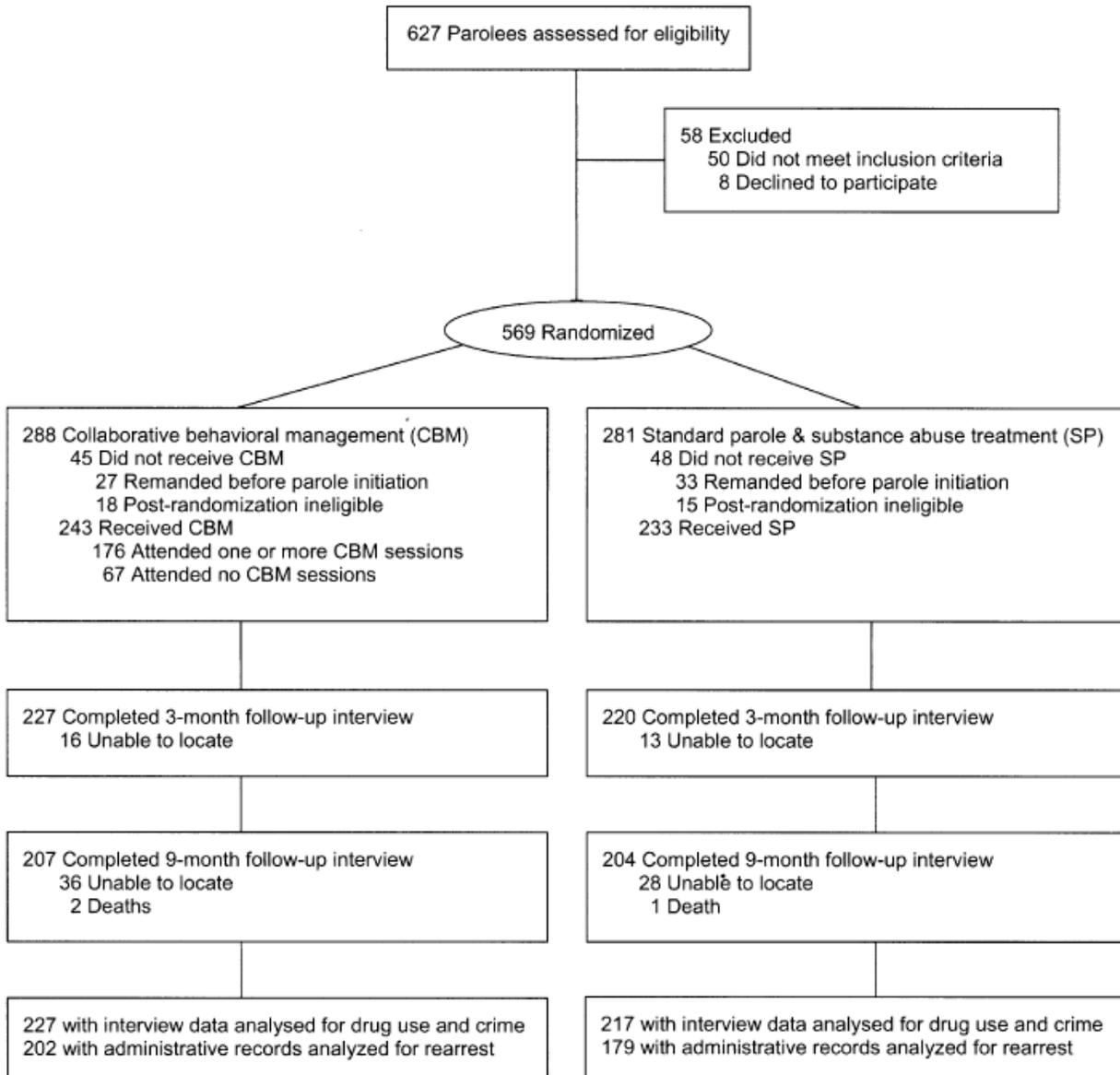
Perceptions of Fairness Theoretical Items.

Table 4.01 Self-Report Questions and Factor Loadings for Perceptions of Parole Officer/Counselor Fairness Items

Procedural Justice Theoretically Specified Indicators of "Perceptions of Parole Officer / Counselor Fairness"	Factor Loading
My parole officer explained exactly what I have to do to succeed on parole	0.698
My parole officer told me what I must do on parole without asking me what I might want	0.083
My parole officer asked me what goals I would like to work on during parole	0.775
My parole officer and I made a contract about the things I should and should not do while on parole	0.665
I know exactly what my parole officer expects of me	0.724
My parole officer is very supportive of me	0.812
My treatment counselor explained exactly what I have to do to succeed in treatment	0.764
My treatment counselor told me what I must do during treatment without asking me what I might want	0.113
My treatment counselor asked me what goals I would like to work on during treatment	0.722
My treatment counselor and I made a contract about the things I should and should not do during treatment	0.703
I know exactly what my treatment counselor expects of me	0.777
My treatment counselor is very supportive of me	0.758
My parole officer or treatment counselor helped me break down my goals into smaller steps that were easier to do	0.796
My parole officer or treatment counselor warned me that they will be watching closely, and if I mess up, even a little bit, I'll go back to prison	0.174
My parole officer or treatment counselor told me that they would try to notice when I was doing well	0.733
My parole officer or treatment counselor told me that I would earn points for doing what I am supposed to do on parole and treatment	0.651
My parole officer or treatment counselor told me that I might get rewards for doing what I am supposed to do on parole and treatment	0.505
My parole officer or treatment counselor told me that I might get sanctions for not doing what I am supposed to do on parole and treatment	0.505
My parole officer or treatment counselor yelled at me	0.524
My parole officer or treatment counselor made me feel bad about myself	0.578

Low Self-Control Theoretical Items.

Table 4.02 Self-Report Questions and Factor Loadings for Self-Control Items

Self-Control Theoretically Specified Traits	Self-Report Measures Selected From The Texas Christian University Client Evaluation of Self at Intake (TCU-CESI) Form	Factor Loading
Impulsive	You have trouble following rules and laws	0.241
Impulsive	You plan ahead	-0.102
Impulsive	You think about probable results of your actions	0.126
Impulsive	You have trouble sitting still for long	0.431
Impulsive	You have trouble making decisions	0.246
Impulsive	You make decisions without thinking about consequences	0.272
Preference for Simple Tasks	You have trouble concentrating or remembering things	0.254
Preference for Simple Tasks	You can do just about anything you really set your mind to do	-0.173
Preference for Simple Tasks	You analyze problems by looking at all the choices	0.074
Risk-Seeking	You avoid anything dangerous	0.013
Risk-Seeking	You like to do things that are strange or exciting	0.116
Risk-Seeking	You like to take chances	0.063
Risk-Seeking	You like the "fast" life	0.156
Risk-Seeking	You like friends who are wild	0.164
Self-Centeredness	You feel people are important to you	0.095
Self-Centeredness	You consider how your actions will affect others	0.121
Volatile Temper	You feel a lot of anger inside you	0.638
Volatile Temper	You have a hot temper	0.826
Volatile Temper	You like others to feel afraid of you	0.302
Volatile Temper	You had feelings of anger and frustration during your childhood	0.508
Volatile Temper	You get mad at other people easily	0.76
Volatile Temper	You have urges to fight or hurt others	0.48
Volatile Temper	Your temper gets you into fights or other trouble	0.743

Peer-Association Theoretical Items

Table 4.03 Self-Report Questions and Factor Loadings for Peer-Association Items

Social-Learning Theoretically Specified Peer-Association Indicators	Factor Loading
Friends Got Into Fights Past 6 Months	0.471
Friends Got Drunk Past 6 Months	0.702
Friends Used Drugs Past 6 Months	0.821
Friends Dealt Drugs Past 6 Months	0.83
Friends Did Illegal Things Past 6 Months	0.865
Friends Spent Time w/Gangs Past 6 Months	0.439
Friends Got Arrested Past 6 Months	0.748

Figure 7.01. Human Research Protections Program, Institutional Review Board Exemption Form

CU NY The City University of New York

Human Research Protections Program
Brooklyn College (CUNY) HRPP Office

DATE: March 26, 2013

TO: Sriram Chintakrindi, MA
FROM: Brooklyn College (CUNY) HRPP Office

PROJECT TITLE: [438839-1] POST TREATMENT DRUG USE, RECIDIVISM, AND
                        ANALOGOUS BEHAVIORS: EXAMINING WHETHER PAROLEES WITH
                        LOW SELF-CONTROL WILL BENEFIT FROM THE COLLABORATIVE
                        BEHAVIORAL MANAGEMENT INTERVENTION

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: March 26, 2013
EXPIRATION DATE: March 24, 2016
REVIEW CATEGORY: Exemption category #4

Thank you for your submission for this project. It has been determined that this project, as submitted, is EXEMPT according to federal regulations, under 45 CFR 46.101(b). As per CUNY policy, approval of exempt research is nonrenewable. The duration of study for exempt research is not to exceed three years. Investigators wishing to continue exempt research beyond the period specified on the approved application must submit a new application to the IRB for approval at the conclusion of the original period.

We will retain a copy of this correspondence within our records. If the scope of this project changes, you must submit a modification request form for a determination to be made whether the project remains exempt.

If you have any questions, please contact the HRPP Office at 718-951-5519 or irb@brooklyn.cuny.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within the City University of New York's records.

- 1 -   Generated on IRBNet

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