The Effect of Solitary Confinement on Institutional Misconduct: A Longitudinal Evaluation

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Abstract

Solitary confinement (SC) has been an important component of the American prison system since the emergence of the penitentiaries in the early 1800s. The main criticism of SC has long been that it causes inhabitants undue psychological distress and by extension increases propensity toward criminal behavior. The use of SC raises constitutional and humanitarian concerns, with critics who charge the practice constitutes cruel and unusual punishment, is inhumane, and violates the minimum standards of decency. However, SC is also a management tool in which correctional officials have come to rely upon for the effective management of prisons, and many would not waiver in the contention that SC is needed to ensure the safety and security of these institutions. Thus, there remains an active debate in the literature and in practice with respect to how SC influences criminal behavior in which three claims have been made: (1) SC decreases criminal behavior; (2) SC increases criminal behavior; and (3) SC has little, if any, effect on criminal behavior. Surprisingly, despite its long-standing and widespread use, SC has remained an elusive subject in empirical research, especially in terms of its effects on behavioral outcomes. This dissertation adds to this gap in knowledge by providing a longitudinal evaluation of the effect of SC on institutional misconduct in a sample of 14,311 inmates in the state of Ohio. The results of this study indicate SC does not have any significant effect on the prevalence or incidence of subsequent violent, nonviolent, or drug misconduct. Policy implications and recommendations based on these findings are discussed.

Dedication

This dissertation is dedicated to my wife Jackie, and our son, Lewis.

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Chapter One

Statement of the Problem

Strategies for the effective management of prisons have long drawn polarizing views amongst penologists. For more than 200 years, the practice of *solitary confinement* (SC) has been the subject of great debate. Although the physical conditions and routines of SC vary by setting and situation, the practice typically includes 22-23 hour a day lockdown with few physical amenities and treatment services made available to inmates (Butler, Griffin, & Johnson, 2013; Metcalf et al., 2013; National Institute of Corrections, 1997). By comparison, inmates living in the general prison population have greater access to various activities (i.e., programming, recreation), which affords them a degree of meaningful social interaction. The use of SC implicitly expresses sentiments of punishment and retribution; however, its stated purpose often also includes the goals of incapacitation, deterrence, and rehabilitation (see Mears & Watson, 2006). In practice, SC provides increased supervision and controls over inmates who have engaged in serious disciplinary misconduct (i.e., *punitive segregation*), or who represent a threat to themselves (i.e., *protective segregation*) or others (i.e., *administrative segregation*; Shalev, 2008).

There is a widely held belief among policy makers and corrections officials that the use of SC is an effective strategy for increasing safety and promoting order throughout the prison system because it reduces criminal activity (Mears, 2013). However, among the many controversial issues that the practice raises is the contention that SC increases (rather than decreases) the likelihood of subsequent institutional misconduct and thus makes prisons less safe (rather than safer) over time (see Pizarro, Stenius, & Pratt, 2006). Further, it has been widely

speculated that long-term durations in SC are responsible for exacerbating the detrimental effects of SC on inmate outcomes (i.e., leads to even more criminal behavior; Mears & Bales, 2010; Pizarro, Zgoba, & Haugebrook, 2014).

Ironically, despite the fact that SC has been used widely in U.S. jail and prison systems for centuries, it has remained an elusive subject in prison research (Labrecque, 2013; see also Briggs, Sundt, & Castellano, 2003, p. 1342; Kurki & Morris, 2001, p. 393; and Ward & Werlich, 2003, p. 54). *Thus, there is a critical need to determine if SC is an effective strategy for making prisons safer and more humane settings. In the absence of such knowledge, the promise of improving institutional policies and practices to achieve this goal will likely remain difficult.*

Solitary Confinement Policies in Context

Over the course of history, various social and political events in the U.S. have led to changes in the way the country operates its prisons and deals with its offenders (Rothman, 1971; McGowen, 1998). Solitary confinement has long been at the center of popular penological thought; and as a result, this practice has been transformed considerably over time (Shalev, 2009). Throughout much of the last three decades the use of SC has increased dramatically in the U.S., despite the lack of any conclusive empirical support of its effectiveness (Haney, 2008; O'Keefe, 2008). Some credit its rise in popularity to the social and political pressure that have made it acceptable—if not mandatory—for policy makers and corrections officials to support punitive punishment policies (Franklin, 1998; King, 1999; Riveland, 1999a; Stickrath & Bucholtz, 2003; Toch, 2003). In this social and political context, SC is often endorsed because it represents the ultimate symbol of political "toughness" (see Garland, 2001).

More recently, fiscal concerns have threatened to challenge the status quo of the U.S. prison system. As policy makers and corrections officials search for new ways to decrease the costs associated with managing offender populations (Campbell, 2003), reducing the use of SC is one potential strategy for saving money (Steinbuch, 2014). For one, SC units are two to three times more expensive to operate than are other housing options, particularly because they require a higher staff-to-inmate ratio (Lawrence & Mears, 2004). The use of SC is also associated with an ever-increasing risk for litigation on constitutional grounds, which could be very costly to state and federal governments (Collins, 2004; Mears & Watson, 2006; Pizarro & Narag, 2008; Schlanger, 2013). However, SC is also a management tool in which correctional officials have come to rely upon for the effective management of prisons (see Mears, 2006; Mears & Castro, 2006), and many would not waiver in the contention that SC is needed to ensure the safety and security of these institutions (e.g., Angelone, 1999; Gavora, 1996a; Stubblefield, 2002).

The Solitary Confinement Debate

There are three schools of thought on the effects of SC that have emerged out of the general prison life literature. The first position—which appears to be the conventional wisdom amongst prison wardens—suggests SC increases safety, order, and control in prisons (see Mears & Castro, 2006). This view tends to align with the "prisons as punishment" philosophy, which rests on the assumption that the stigmatizing and humiliating experience of prison life is the antidote for pursuing a criminal lifestyle (see Gendreau & Smith, 2012). Proponents of this view maintain that prison conditions must be made much harsher (e.g., segregation) to achieve these desired effects (Angelone, 1999; Gavora, 1996b; Stubblefield, 2002). According to this perspective, the application of SC will result in a *decrease* in criminal behavior.

In contrast, a second school of thought insists that most inmates in SC will develop "lasting emotional damage, if not full-blown psychosis and functional disability" (Kupers, 2008, p. 1006). Proponents of this view maintain that SC causes serious health problems and increases criminogenic risk (Fellner, 2000; Fellner & Mariner, 1997; Grassian, 1983; Grassian & Friedman, 1986; Haney, 2012a; Jackson, 1983; Kupers, 2008; Scharff-Smith, 2006). This view tends to align with the "schools of crime" theory, which describes inmate behavior as a function of the prison environment whereby inmates adopt antisocial values through a process of prisonization and social learning (Buckstel & Kilmann, 1980; Clemmer, 1940; Sykes, 1958). According to this perspective, the application of SC will result in an *increase* in criminal behavior.

Finally, a third perspective contends that SC has only a minimal effect on offender outcomes (Clements et al., 2007; Gendreau & Goggin, 2013; O'Keefe, Klebe, Stucker, Sturm, & Leggett, 2010; Suedfeld, Ramirez, Deaton & Baker-Brown, 1982; Wormith, 1984). This position suggests there are factors that increase an inmate's probability for being placed in SC (e.g., gender, age, race, risk level, mental health status, institutional behavior, how inmates are treated) which are actually responsible for influencing these outcomes (Pizarro et al., 2014). This view tends to align with the "behavioral deep freeze" theory, which describes inmate behavior as an extension of previously held values and motivations where preprison socialization factors influence adaptation and behavior (Irwin, 1980; Irwin & Cressey, 1962; Thomas, 1977; Thomas & Foster, 1973). According to this perspective, the application of SC will have *little to no effect* on criminal behavior when these other relevant factors are controlled for.

Solitary Confinement Research

Despite the fact that SC has been debated and used in U.S. prisons for centuries, it has a rather unfortunate and unimpressive literature base (Labrecque, 2013). A review of the SC literature reveals four critical limitations. First, there have been far fewer empirical SC investigations compared to those that are qualitative in nature. That is not to say that impressive studies do not exist, but rather that they are the exception rather than the rule (e.g., Lovell, Johnson, & Cain, 2007; Mears & Bales, 2009; Morris, 2015; O'Keefe et al., 2010; Zinger, Wichmann, & Andrews, 2001). Therefore, most of what is known about the effects of SC is based on subjective or anecdotal evidence (e.g., S. Bauer, 2012; Benjamin & Lux, 1975; Beth-Pheiffer, 2004; Brodsky & Scogin, 1988; Grassian, 1983; Haney, 2003; Jackson, 1983; 2003; Korn, 1988a; 1988b; Kupers, 2008; Lovell, 2008).

Second, there have been far fewer empirical evaluations of behavioral outcomes compared to those that are physical or psychological in nature. In a recent meta-analysis on the effects of SC, Labrecque, Smith, and Gendreau (2013) found that only nine of the 65 effect size (ES) estimates generated in their study examined behavioral type outcomes (i.e., post-release recidivism, institutional misconduct). The remaining 56 ES estimates were generated from indices that were either medical/physiological or psychological in nature. What is more, although the majority of research reviews and commentaries written on this topic to date have tended to suggest that SC leads to several unintended consequences (i.e., increased mental illness, physiological abnormalities, increased hospitalization and suicide risk; Andersen et al., 2000; Andersen, Sestoft, Lillebaek, Gabrielsen, & Hemmingsen, 2003; Brodsky & Scogin, 1988; Cloyes, Lovell, Allen, & Rhodes, 2006; Felthous, 1997; Grassian, 1983; Grassian & Friedman, 1986; Haney, 2003; Irwin, 2007; Kupers, 2008; Lanes, 2011; Lovell, 2008; Miller, 1994; Miller

& Young, 1997; Rhodes, 2004; Sestoft, Andersen, Lillebaek, & Gabrielsen, 1998; Way, Sawyer, Barboza, & Nash, 2007), the Labrecque et al. (2013) quantitative synthesis of the empirical evidence did not find support for this conclusion. It should be noted Morgan et al. (2014) also conducted a meta-analysis of the SC outcome literature, independent of Labrecque et al. (2013), which produced a similar result.

The results of these two meta-analyses cast some doubts about SC being as devastating to inmates as has often been portrayed in the media and by some human rights organizations, activists, and scholars who vehemently oppose the practice on moral/ethical grounds (e.g., Casella, 2010; Daly, 2010; Fellner, 2000; Fellner & Mariner, 1997; Gawande, 2009; Goode, 2012a; Guenther, 2012; Harrington, 1997; Isaacs & Lowen, 2007; Keim, 2013; Taub, 2000). Those who oppose SC tend to use powerful excerpts from interviews with inmates in order to prove that the practice is psychologically damaging. However, others have pointed out that these qualitative investigations are host to a number of methodological shortcomings (e.g., selection bias, response bias, non-existent or inadequate comparison groups, cross-sectional designs, clinical observation and/or self-report rather than objective measures), which it their view limit the generalizability of the results (Gendreau & Bonta, 1984; Gendreau & Labrecque, in press; Suedfeld et al., 1982; Zinger et al., 2001). Although more research is clearly needed in this area before any definitive conclusions should be drawn, these findings serve as a caution to reviewers about making judgments regarding the effects of SC too hastily, especially when they are based on qualitative rather than quantitative evidence.

Third, there have been far fewer empirical evaluations of institutional misconduct compared to investigations of post-release recidivism. Although the results from the recidivism studies indicate that SC produces a weak negative effect (Butler, Steiner, Makarios, & Travis,

2013; Lovell & Johnson, 2004; Lovell et al., 2007; Mears & Bales, 2009; Motiuk & Blanchette, 2001; Pizarro et al., 2014; Ward, 2009; Ward & Werlich, 2003), there have been only two studies to assess the impact of SC on institutional misconduct (Briggs et al., 2003; Morris, 2015). *Therefore, the extent to which SC is responsible for influencing behavioral outcomes in prison remains an open empirical question.*

Finally, there is very little information available on potential moderators in the current literature base (e.g., age, gender, race, mental health status, risk for recidivism). Further, the data is virtually non-existent on situational variables (e.g., how inmates are treated, institutional climate, reasons for being sent to SC, physical conditions of SC, health care and treatment services, access to outside contacts), which also have the potential to be powerful predictors of criminal behavior (see Gendreau & Labrecque, in press). The absence of this vital information limits the understanding of how SC may influence inmate outcomes. It also limits the ability of correctional agencies from developing or adopting evidence-based SC policies and practices that make use of such knowledge.

Current Study

In response, this dissertation seeks to fill a critical gap in the literature by examining the understudied area of the effect that SC has on inmate adjustment in prison. Specifically, this study uses a pooled time series panel design to test the effects that SC has on subsequent institutional misconduct. The sample in this study includes 14,311 inmates who spent time in SC in the Ohio Department of Rehabilitation and Correction (ODRC) prison system. Data on prison misconduct and other measures of institutional adjustment (e.g., length of time spent in SC), as well as key offender-level demographics (e.g., gender, age, race, risk level, mental health

diagnosis, institutional behavior) were also collected as part of this investigation. This study, therefore, has both theoretical and practical value and its intention is to provide prison officials with independent, evidence-based knowledge regarding the effects of SC on inmate behavior. *The findings of this study have direct implications for criminal justice policy and practice in the U.S. and will assist policy makers and corrections officials in making better, more informed decisions regarding the practice of SC.*

Research Strategy

The purpose of this dissertation is to develop a set of evidence-based SC policy recommendations that will guide policy makers and corrections officials in reducing the inmate misconduct that occurs in prison. To accomplish this objective, this study will pursue the following three specific research questions:

> ***Research Question One:*** **Does the experience of SC influence subsequent inmate misconduct in prison?**
>
> ***Research Question Two:*** **Does the length of time spent in SC influence subsequent inmate misconduct in prison?**
>
> ***Research Question Three:*** **Are there offender characteristics (e.g., risk, mental health status, gender, age) that mediate the effects of SC on subsequent inmate misconduct in prison?**

Summary

This chapter has described the need for more empirical research to help determine if SC is an effective strategy for making prisons safer and more humane settings. It has also briefly presented the current state of the SC debate and examined how each position discussed in the literature fits within a more general theoretical framework. Finally, it has highlighted the limitations of the current SC literature in informing relevant policy decisions and presented three

important research questions that this work intends to address. The second chapter of this dissertation expands upon this discussion by further reviewing the SC and the general prison life literatures. Chapter three describes the method used to conduct this study and the techniques that will be used to analyze the data. The main analysis assess if SC, and the length of time spent in SC, influence subsequent inmate institutional misconduct. Finally, chapter four discusses the results of this dissertation and chapter five reviews the implications and recommendations based on these findings.

Chapter Two

Solitary Confinement as a Penal Strategy

Historical Perspective on Solitary Confinement in the United States

The emergence of *solitary confinement* (SC) as a penal strategy (i.e., the practice of confining inmates in solitary cells with limited access to human contact or stimulation) first began in the U.S. during the early-nineteenth century (Foucault, 1995). During this time, upset with the inability of the prison to reduce crime, penal reformers focused their attention on addressing what they perceived to be the defects of these institutions (Rothman, 1971). Reformers believed that these early correctional facilities often failed because they did not shield inmates from the destructive nature of the prison environment (Blomberg & Lucken, 2010). Thus, a new type of institution was created: *the penitentiary* (Rothman, 1998a). Penitentiaries were built, by intent and by design, to separate offenders from all contact with corruption, including other inmates (Kann, 2005). Supporters of this new penological philosophy fully anticipated that the benefits of these institutions would extend far beyond the prison walls. That is, the penitentiary promised not only to reform criminals into law-abiding citizens, but also to serve as a model for proper social citizens in socially disorganized cities (see Blomberg & Lucken, 2010; and Rothman, 1971).

Since the inception of the penitentiary, SC has remained an important component of the American penal system (Browne, Cambier, & Agha, 2011; Foucault, 1995; Kurki & Morris, 2001; Rhodes, 2004; Scharff-Smith, 2006; Ward & Werlich, 2003). Over time, however, SC has experienced periodic waves of accelerated and decelerated use, and there have been many shifts in the purposes that this practice has been expected to serve (see Shalev, 2009). In the mid-

nineteenth century, SC was the main form of imprisonment for entire prison populations, and the strategy was aimed at reformation. By the late-nineteenth century, this goal was deserted, as was the practice of keeping entire prison populations in SC settings. Throughout much of the twentieth century, prison administrators have primarily used SC to deal with inmates who have engaged in serious institutional misconduct, or who otherwise represent a threat to themselves or others (Shalev, 2009).

In the late-twentieth century, however, a growing concern for staff safety coupled with the politicization of crime control, led to an increase in the use of SC with the development of a new type of institution: *the supermax prison* (King, 1999; Riveland, 1999a). Supermax prisons are specialized facilities (or units) that have been designed to hold the most serious and chronic troublemakers from the general prison population (Henningsen, Johnson, & Wells, 1999). The function of the supermax is not to rehabilitate, but rather it is dedicated solely to providing increased control over inmates who are known (or thought to be) violent, assaultive, major escape risks, or likely to be otherwise disruptive in the general prison population (National Institute of Corrections, 1997; Riveland 1999b). These prisons use sophisticated technology in order to efficiently and effectively manage and control inmates under SC conditions (Haney, 1993).

Throughout history, SC has sought to serve many different purposes, including reformation, punishment, protection, behavior modification, and prisoner management and control (Shalev, 2009). These diverse, and at times contradictory objectives have caused this practice to long be at the center of controversy and debate (see Haney, 1997; Scharff-Smith, 2006). Furthermore, each of these goals are rooted in several different theories about human nature, crime, and punishment, which have made evaluating the effectiveness of this correctional

policy more difficult (Mears, 2013). Toward the end of developing well-informed SC policies, this dissertation begins by examining the historical context in which these various aims have emerged. It then reviews the general prison life literature and discusses the current status of the SC debate. Finally, it presents several challenges that must be overcome in order to effectively evaluate SC as a correctional policy.

Punishment in Colonial America. The American Colonial society was organized around three primary institutions: the family, the church, and the community (Blomberg & Lucken, 2010). In the Colonial Era (1600-1790), religion entered into all aspects of life (Bonomi, 1986). Therefore, it was common for sin to be equated with crime, and sin, like crime, demanded retribution (Rothman, 1971). When the informal social controls of the family, church, and community failed to curb criminal (or sinful) behavior, the colonists relied on harsh penalties to exact justice (Friedman, 1993). Eighteenth-century punishments were severe and often included fines, banishment, whippings, and capital sentences (Kann, 2005). During this era, the purpose of the jail was merely to hold persons awaiting trial, those convicted but not yet punished, or debtors who had still to meet their obligations (Rothman, 1971). In this way, *jails facilitated the process of criminal punishment, but were not themselves an instrument of discipline* (Cullen & Gilbert, 1982).

At the close of the eighteenth-century, however, several demographic, economic, and intellectual developments worked together to change the public view on crime and punishment (Rothman, 1971). From the American Revolution came the Industrial Revolution, a westward expansion and the era of penal modernity (Elkins & McKitrick, 1993). Migration and urban growth rendered many of the traditional mechanisms of social control (e.g., family, church,

community) obsolete (Friedman, 1993). Colonists also began to perceive the spectacle of torture and punishment as horrifying and barbaric, an affront to the standards of decency (Foucault, 1995). Suddenly, the premises upon which the colonial system had been based no longer appeared valid (Rothman, 1971). Colonial laws and customs—which were largely an influence from English ties—came to be viewed as crude, backward, arbitrary, irrational, and ultimately ineffective (Blomberg & Lucken, 2010). Fed up with the colonial methods of justice, post-revolutionary reformers sought to develop new penal policies (Kann, 2005).

Penal law reform: Prison as punishment. Reformers of this era were heavily influenced by the Enlightenment movement (see Beccaria, 1764/1963; and also Bentham, 1789/1948) and came to believe that deviant behavior was a product of the barbaric colonial criminal codes (Rothman, 1971). These penal policies were perceived to be so severe, inconsistent, and irrational that they actually encouraged criminal behavior (Blomberg & Lucken, 2010). It was reasoned that the severity of the punishment itself was invigorating men to commit the very wrong doings it was supposed to prevent (Beccaria, 1764/1963). Once the link between the barbaric laws and deviant behavior was established, the goal became clear—to modify the criminal laws to reflect the principles of a rational government (Rothman, 1971). Enlightenment thinkers reasoned that the key to eliminating criminal behavior was the establishment of a penal code that prohibited unbridled discretion, favoritism, and oppression (see Akers & Sellers, 2009; and Jacoby, 1979). In the wake of this movement, new criminal statutes called for periods of confinement rather than the use of corporal punishments—*prison itself became the punishment* (Ignatieff, 1983). The deprivation of liberty through incarceration provided a rational substitute for public shaming techniques and bodily torture (Foucault, 1995).

During this period of transition, beliefs about human nature, society, and the proper role of government were drastically altered (Blomberg & Lucken, 2010). The Enlightenment movement created a paradigm shift in the explanation of criminal behavior (see Akers & Sellers, 2009; and Jacoby, 1979). In stark contrast to the Colonial Era, wherein crime was explained in terms of sin, crime in the nineteenth century was attributed to archaic legal codes that were counterintuitive of free will (Rothman, 1971). However, in the rush to abandon the old punitive practices, little thought was given to how prisons should be operated, and these institutions soon became overcrowded and difficult to manage (Blomberg & Lucken, 2010). What is more, rising crime rates through the 1820s cast doubt on the ability of the new penal codes to effectively reduce crime (Kann, 2005). However, many still believed that despite the many flaws and inadequacies of the prison, the practice still represented a vast improvement over the punishments that were used in the previous era (Foucault, 1995). Thus, penal reformers turned their attention to addressing what they perceived to be the defects of the early prison system: the corrupt prison environment (Blomberg & Lucken, 2010).

Moral reform: The invention of the penitentiary. Since more rational penal policies did not eliminate crime as intended, the view on crime and punishment no longer seemed satisfactory (Rothman, 1971). Crime came to be viewed as the product of a disorganized and evil city environment (see also Park & Burgess, 1925; and Shaw & McKay, 1942). Crime was seen as a moral disease, which was attributable to a number of social factors, such as the rapid growth in wealth, population increase, immigration, and manufacturing (Rothman, 1980). Implicit in this outlook was an impulse for moral reform (Blomberg & Lucken, 2010). If deviancy could be created, it stood that it could also be eradicated (Rothman, 1971). Even

though reformers had been motivated to rethink the causes of crime and the purposes of punishment, they were not compelled to abandon the idea of the prison (Rothman, 1980). If the inadequacies of the family and the breakdown of the community were the problem, then the prison would be used to eliminate those specific influences that were breeding crime, and demonstrate the fundamentals of a proper social organization (Rothman, 1998a). In this social context, a new type of prison—*the penitentiary*—emerged ready to replace those that had been built in the eighteenth century (Ignatieff, 1983). The idea was to design an environment that eliminated the tensions and chaos found in society (Gendreau & Goggin, 2013). In the new scheme, the penitentiary satisfied a variety of motives, none less than to repair the fragmented society (Blomberg & Lucken, 2010; Rothman, 1971).

In the late eighteenth and early nineteenth century, two competing prison organizational schemes emerged that were largely influenced by the ideology of the evangelically-minded Quakers (Cullen & Gilbert, 1982). The first model, known as the Pennsylvania "solitary" (or "separate") system, demanded total isolation and prisoners were compelled to work in their cells alone (Franke, 1992). The Bible was the only reading material allowed. This absolute solitude was broken only for meetings with the Chaplain to deliver a Christian message (McGowen, 1998).

The second model, known as the Auburn "congregate" (or "silent") system, also emphasized the importance of solitude. In this model, prisoners were forced to sleep in their cells alone, but were allowed to congregate during the day for meals, hard labor, and Sunday worship (Cullen & Gilbert, 1982). In this regime, no communication was allowed; even interactions with staff were kept to a bare minimum (McGowen, 1998). Whereas the Pennsylvania system sought to separate inmates from interacting with each other through

physical barriers, the Auburn system relied on the rules of silence, backed by the willingness to use corporal punishments (e.g., whip) in order to ensure compliance (Cullen & Gilbert, 1982).

The primary point of contention between the two schemes was whether or not prisoners should work individually within their cell (i.e., separate) or in silence in large groups (i.e., congregate; Rothman, 1980). Proponents of the Pennsylvania model insisted that continuous isolation was superior because it guaranteed that inmates would avoid all contamination and would follow the path to reform (Lieber, 1838/2010). The Auburn supporters fought back, insisting that the effect of constant and unrelieved isolation on prisoners was so unnatural that it bred insanity (Rothman, 1971).

Despite these fundamental differences, there were many commonalities between these two management schemes. Both sides emphasized isolation, obedience, and a steady routine of labor as an integral part of their plan for reformation (Rothman, 1998b). The underlying philosophy of both of these models was that the use of SC would afford prisoners the ability to repent and reform (Rogers, 1993). Administrators were confident in the power of faith to reform prisoners and were distinguished in their belief that rehabilitation was the only real task of the institution (McGowen, 1998). They believed that the SC setting, which removed the offender from all temptations, and substituted a steady and regular regimen, would ultimately reform him (Lieber, 1838/2010). Just as the offenders' environment had led him to crime, the prison environment would lead him out of it (Blomberg & Lucken, 2010).

Reformers fully anticipated that their work inside the penitentiary would have a critical significance beyond the prison walls (Rothman, 1971). They believed that the penitentiary would go on to serve as a model for proper social inhabitants of socially disorganized cities (Blomberg & Lucken, 2010). It was no wonder, then, that the New York and Pennsylvania

supporters held their position so staunchly, eager to defend every detail. Nothing less than the fate of the entire nation was at stake. The prison was designed to carry a message to the community. If the prison could train the most corrupt persons, surely it could also reawaken the public to these virtues. The institution became a laboratory for social improvement and in so doing would promote a new respect for order and authority (Blomberg & Lucken, 2010).

During this time, the American penitentiaries had become world famous and were being touted as the pride of the nation (Rothman, 1998b). Initially, many state facilities followed the Pennsylvania model of total isolation, but it was the Auburn model that went on to serve as the blueprint for nearly every prison built in the U.S. during the mid-1800s (Cullen & Gilbert, 1982). This was, perhaps, for no other reason than congregate living was less expensive than unbroken solitary living, and that the Auburn model promised to hold more inmates, and thus could bring in more money through convict labor (Rothman, 1998a). However, the congregate model also had to rely on the use of corporal punishments (e.g., whip) to ensure compliance on the rules of silence, and as soon as prisons became crowded and corruption became rampant, ensuring silence and isolation simply became impossible (Rotman, 1990).

By the 1850s, the hope of eradicating crime through incarceration no longer subsisted the country (Rothman, 1971). What is more, the Civil War would eventually place a financial strain on the government. Just when the prisons needed more funding to maintain their design, more money was also needed for the war efforts (Rothman, 1971). By 1865, there was few traces left of the original penitentiary designs (Rotman, 1998). *The penitentiary, despite all of the hype and promises, ultimately did not eradicate crime or spark reform in society as predicted* (Kann, 2005).

Progressive reform: Limiting the use of solitary confinement. In response to the results from the penitentiary movement, there was a shift away from the tenets that had once supported its use (Blomberg & Lucken, 2010). However, despite the many shortcomings of the penitentiary system, there was still a tremendous amount of public support for the use of the prison as a means to deal with criminal offenders (Rothman, 1971). During this time (1880s to 1920s), many institutions were renamed "reformatories" in order to symbolize a fundamental change in penological philosophy (see Blomberg & Lucken, 2010). The purpose of the reformatory prison was to rehabilitate inmates through access to educational and vocational services, constructive labor, humane disciplinary methods, and incentive to comply (i.e., parole; Pisciotta, 1994). In this new scheme, SC was no longer a universal practice, rather it was only to be used for those inmates who were not "reformed", or when other methods of discipline (e.g., corporal punishments) proved ineffective (Miller, 1980). Inmates who were placed in SC were often left there from days to sometimes months at a time (Rotman, 1998).

During this new era, social-structural explanations, as well as biological and psychological theories of crime guided much of the progressive penal reform (see Akers & Sellers, 2009; Cullen & Agnew, 2011; Kubrin, Stucky, & Krohn, 2009; Lilly, Cullen, & Ball, 2011). This change in thought meant criminals were no longer going to be punished for their moral failings, but rather they were to be rehabilitated for the failings brought on by psychological, biological, and/or social irregularities (Brockway, 1871). The tenets of this new progressive penology were formally articulated during the 1870 National Congress on Penitentiary and Reformatory Discipline in Cincinnati, Ohio (see Wines, 1871). The sum of the principles was the promotion of individualized treatment: Progressive strategies would focus on the nature of the offender, not the offense (Barnes, 1972).

During the early decades of the twentieth century, the American correctional system experienced a major organizational growth (i.e., prison, parole, probation, juvenile court; Austin & Irwin, 2012). In this expansion many prisons were renamed "correctional institutions" and the "rehabilitative ideal" ruled the day (see Allen, 1964). Although much is credited to the advancements during this time period, a number of historians have argued that the actual practices associated with prisons, despite the rehabilitative rhetoric to the contrary, were still largely characterized by punishment and control (e.g., Pisciotta, 1994; Rothman, 1980; Rotman, 1998). Although the intentions behind the reformatory were noble, the intended goals were not always met for a number of administrative, political, and financial reasons (Rothman, 1980; Rotman, 1998). For example, many of the conditions that ultimately led to the demise of the penitentiary, including overcrowding, understaffing, and corruptive practices, were also present in the new reformatories (Pisciotta, 1994; Rothman, 1980; Rotman, 1998). Therefore, to many, these institutions offered little more than scientific jargon and justification for practices that were neither new nor humane (Pisciotta, 1994).

Further, there was also a movement occurring within the system to return to the strict control practices found in the penitentiaries. For example, in 1933, the Federal Bureau of Prisons opened a prison on Alcatraz Island in San Francisco, which boasted to house the country's most notorious criminals (Ward, 2009). In 1963, the same year that Alcatraz was closed, another federal prison—United States Penitentiary (USP) Marion (Illinois)—began housing the federal and other state systems most violent prisoners (Richards, 2008). The rationale behind the development of these new high security prisons was that SC was necessary to maintain control and order throughout the prison system (Ward & Werlich, 2003).

Penal harm reform: "Getting tough" on crime. During the first half of the twentieth century, there was a broad optimism that the use of prison could rehabilitate criminal offenders (Cullen & Gilbert, 1982). However, by the close of the 1970s, during a period referred to as the "age of discontent" (Blomberg & Lucken, 2010), the publics' faith in the government's ability to reduce crime was diminished (Cullen & Gilbert, 1982). As reports of the deplorable conditions in prison, and mistreatment of inmates, surfaced to the public eye in the 1960s, a renewed focus went on improving the living conditions in prison (Jacobs, 1980; Krantz, 1976). Some credit the Prisoner Rights Movement, which occurred on the heals of the Civil Rights Movement and Women's Rights Movement for helping to improve the conditions in SC (e.g., personal hygiene, physical conditions of the cell, exercise, diet, and duration of isolation; Feeley & Hanson, 1990).

However, just as things appeared to be improving for inmates, a counter rehabilitation movement was occurring throughout the entire criminal justice system. Martinson's (1974) conclusion that "nothing works" discredited many attempts at rehabilitating offenders, and by the 1980s, incapacitation took over as the dominant correctional philosophy (Zimring & Hawkins, 1995). The common public perception at the end of the 1980s was that, despite the time and money devoted to rehabilitation, crime continued to be a major societal problem (Clear, 1994; Garland, 2001). This "law and order" agenda came to dominate public policy changes throughout the 1980s and 1990s. With a public growing ever fearful of crime, politicians seized the opportunity to make the crime solution a political issue (Simon, 2007).

During this time, several correctional policies were enacted that reversed those of the previous decades (Blomberg & Lucken, 2010). Where the previous one hundred years were based on the rehabilitative ideal, almost at once, the "get-tough" movement, which was based on the notions of retribution, deterrence, and incapacitation, took over (Currie, 1998; Langan, 2005;

Garland, 2001). However, these new "get tough" penal policies (e.g., mandatory minimums, three-strikes laws, increased punishment, War on Drugs), coupled with an increasing crime rate, drastically increased the prison population in the U.S. (Austin & Irwin, 2012; Austin, Irwin, & Kubrin, 2011; Blumstein & Beck, 1999; Clear, 1994; Currie; 1998; Joyce, 1992; Langan, 1991; Rothman, 1980; Tonry, 2001; Zimring, 2001). These changes to the prison population led to various systemic problems, including overcrowding (Steiner & Wooldredge, 2008a; Wooldredge, 1996) and increased violence (Steiner & Wooldredge, 2008b; Wooldredge, Griffin, & Pratt, 2001). This transformation of the prison structure made the use of SC a tool for ensuring order within the prison walls (Morris, 1998).

These changes to the inmate population made managing offenders in prison more difficult (DiIulio, 1987). Corrections researchers and practitioners consider prison order and safety to be very important in running prisons (Bennett, DiIulio, & Walters, 1996; Reisig, 1998; Useem & Reisig, 1999). Some penologists have argued that the best way to manage difficult prisoners was to disperse them among different prisons to dilute their negative influence in populations of generally conforming inmates (i.e., *dispersal model*; see Shalev, 2009). Others, however, contend that the most violent and dangerous inmates from a number of prisons ought to be concentrated in one tightly controlled prison (i.e., *concentration model*; see Shalev, 2009). In an evaluation of institutional violence in U.S. state prisons, Briggs et al. (2003) found mixed support for the effectiveness of the dispersal versus concentration models. Specifically, Briggs et al. (2003) found states with a concentration approach (i.e., those with supermax prisons) had lower levels of inmate-on-inmate violence compared to those states with a dispersal approach (i.e., those without supermax prisons); however, the implementation of supermax prisons had

mixed effects on inmate-on-staff violence (i.e., some states had increases in staff assaults, some states had reductions in staff assaults, and some states had no changes in staff assaults).

Managing risks: The birth of the supermax. Supermax prisons represent a new management style in corrections that focuses on managing risk (Feeley & Simon, 1992; 1994; Shalev, 2009; Simon & Feeley, 2011). That is, the goal of correctional institutions is to identify, classify, and manage groups sorted by levels of perceived dangerousness. This supports the selective incapacitation of subgroups of inmates in SC settings. In this regard supermax facilities (or units) have been designed to hold the most serious and chronic troublemakers from the general prison population: the so-called "worst of the worst" (Henningsen et al., 1999; Shepperd, Geiger, & Welborn, 1996). The function of the supermax is not to rehabilitate, rather it is dedicated solely to providing increased control over inmates who are known (or thought to be) violent, assaultive, major escape risks, or likely to be otherwise disruptive in the general population (National Institute of Corrections, 1997; Riveland 1999b). These prisons use sophisticated technology in order to efficiently and effectively manage and control inmates under SC conditions (Haney, 1993; Toch, 2001). The rationale for the use of supermax facilities is that SC is an effective punisher that will suppress anti-social behavior in prison and after release (Angelone, 1999; Gavora, 1996b; see Mears & Castro, 2006).

Initially, even the prisoners in USP Marion were allowed to congregate for certain activities. However, in the 1980s, after several inmates and officers were killed, the prison declared a state of emergency and "locked down" (Ward & Werlich, 2003). Across the country more broadly, there were also increases in the number of disturbances and riots (see Colvin, 1992; Irwin, 1980; Jacobs, 1977; Useem & Kimball, 1991). This led many state systems to

follow suit, and construct their own supermax prisons (Riveland, 1999a; Sundt, Castellano, & Briggs, 2008). As of 2004, 44 states are known to operate 57 supermax facilities, collectively housing at least 25,000 inmates (Irwin, 2007; Mears, 2005; 2008; Naday, Freilich, & Mellows, 2008). Further it is estimated that 1.8% of all state and federal inmates serving one or more years in prison are in supermax settings (King, 1999). As most states and the federal government have increased their use of supermax facilities, so to has the controversy surrounding these punitive regimes (Ward, 1995). Some have promoted the supermax as a new *panacea* for correctional management problems, while others maintain these prisons are symbolic of the *desperation* Americans face in trying to reduce crime (see Hemmingsen et al., 1999).

The extent of the use of supermax prisons, however, varies considerably between states. In a 1998 survey of state department of corrections, some organizations (e.g., Pennsylvania) reported incarcerating less than 1% of inmates in supermax facilities, while others (e.g., Mississippi) reported incarcerating up to 12% (King, 1999). As definitional and reporting issues have also been documented (see Butler, Griffin et al., 2013; Jacobs & Lee, 2012; Jacobson, 2012; Naday et al., 2008), in all likelihood these estimates are low (Browne et al., 2011). There is also evidence that indicates the duration of inmates placed in supermax housing ranges considerably from less than one month to more than 36 months (Mears & Bales, 2010).

The future of solitary confinement. Over the course of history, various social and political events in the U.S. have led to changes in the way the country operates its prisons and deals with its offenders. One correctional practice, SC, has long been at the center of popular penological thought. As a result, this practice has been transformed considerably over time (Shalev, 2009). The original purpose of SC was to reform inmates by affording them the

opportunity to repent for their sins and to learn the value of hard work through the steady routine of labor (Cullen & Gilbert, 1982). However, after corruption and crowding led to the demise of the absolute isolation, prisons began to use SC selectively among inmates for the purposes of *punishment*, *protection*, and *behavior modification* (Rotman, 1990). In the late-twentieth century, the use of SC has again expanded, particularly through the use of the supermax prison, and its purpose has again shifted to be more about *management* and *control* (Feeley & Simon, 1992; Shalev, 2009).

The current penal practices not only reflect the present state of American penology, but also provide a connection between penology's past and future. Supermax prisons, and SC more generally, represent, in some ways, a reconstruction of past ideas and practices. The U.S. should no longer be content to support and implement public policies that are without abundantly clear empirical justification. We simply must alter the historical pattern in American penology of "reform without change" (Rothman, 1980). With this goal in mind, this dissertation seeks to add to the science of the effects of imprisonment by examining how the theoretical perspectives on the effects of the general prison life can be applied to the study of one aspect of the prison environment, the SC setting. The empirical general prison life and SC literatures will first be reviewed in order to assess what is known (*and unknown*) about the effects of these practices on inmate behavior.

The Effects of Prison Life

At yearend 2012, there were more than 2.2 million adults under some form of imprisonment in the U.S. (Glaze & Herberman, 2013). This translates into approximately one out of every 108 adults in the U.S. who are incarcerated in either prison or jail on any given day.

This not only make the U.S. the world leader in imprisonment, which accounts for only 5% of the world's population, yet houses 25% of the nine million people incarcerated worldwide (Pew Center on the States, 2008), but also reflect the nation's belief that prison is an effective strategy for managing criminal offenders (e.g., makes communities safer; see Clear, 1994). The extent of the use of incarceration in the U.S. has periodically fluctuated over time. These transformations to the nations' correctional landscape have evolved from changes in the public sentiment toward what purpose(s) the prison is supposed to serve (e.g., retribution, rehabilitation, deterrence, incapacitation).

Recall that punishment in Colonial America had a retributive goal; crime was to be reduced by administering harsh penalties (i.e., corporal punishments) on offenders (Blomberg & Lucken, 2010). It was not until the post-revolutionary period when the prison would take over as the dominant form of punishment in the U.S. (Ignatieff, 1983). The initial purpose of imprisonment was to reform (or rehabilitate), thereby making inmates less likely to engage in further crime when released (Kann, 2005). Over time, there have been several social and political factors (e.g., changing views on the causes of crime, prison crowding, corruption) that have caused the structure of, and practices within, the prison to transform (e.g., penitentiary, reformatory, correctional facility, supermax). However, until the late twentieth-century, the one thing that had remained constant in prison was the focus on rehabilitation as the overarching goal.

This changed in the late-1970s when the U.S. experienced an unprecedented shift in penological ideology. Rising crime rates coupled with a growing distrust in the government's ability to effectively rehabilitate offenders resulted in a shifting in the prisons priorities away from rehabilitation toward deterrence and incapacitation (Cullen & Gilbert, 1982; Currie, 1998;

Langan, 2005; Garland, 2001). This change led to the widespread adoption of more punitive penal policies (e.g., mandatory minimums, three-strikes laws, increased punishment, War on Drugs) and ultimately dramatically increased the prison population (Clear, 2007; Garland, 2001). Whereas the imprisonment rates in the U.S. remained relatively stable for the half century prior to 1970 (Blumstein & Cohen, 1973), by the close of the century, the incarceration rate increased by more than fourfold (Lawrence & Travis, 2004). In 2008, there were more than 2.4 million adults incarcerated in the U.S. (Sabol, West, & Cooper, 2009). However, in 2010 the total state prison population declined for the first time in nearly 40 years (Pew Center on the States, 2010). This reduction indicates that perhaps another shift in penological thought is emerging (Listwan, Jonson, Cullen, & Latessa, 2008).

According to a Pew Center on the States (2008) report, correctional budgets were the second highest expenditure in the U.S., falling only below those for education. This means there are not only a significant number of inmates incarcerated in the U.S., but also that the government spends a considerable amount of money housing these offenders. Although the imprisonment rates have continued to rise throughout much of the last four decades, there have been many to insist that mass incarceration policies are a bad policy choice (e.g., Clear, 1994; 2007; Cullen & Gilbert, 1982; Currie, 1998; Garland, 2001; Haney, 2012b; Simon, 2007).

In evaluating the effectiveness of incarceration in reducing crime, the general prison life literature will now be reviewed. There are three perspectives that have emerged in this literature that offer some insight as to how prison may influence institutional adjustment (Gendreau & Goggin, 2013; Gendreau & Smith, 2012). Each of these perspectives draws their theoretical underpinnings from diverse bodies of work and makes different assumptions about human

nature. In order to take stock of what is known (and not known) about the effects of prison on inmate behavior, the empirical evidence for these positions will also be examined.

Prison as punishment. According to the "prison as punishment" perspective, offenders who are incarcerated are more likely to abstain from crime in the future (Andenaes, 1968; Zimring & Hawkins, 1973). This philosophy rests on the assumption that the stigmatizing and humiliating experience of prison life is the antidote for pursuing a criminal lifestyle (see Gendreau & Smith, 2012). In this view, the function of the prison is that of a specific deterrent, whereby the experience of being imprisoned enhances the perception that any further criminal involvement will result in further sanctioning (DeJong, 1997). Arguably, specific deterrence has become one of the most popular justifications for incarcerating offenders in the public arena (see Doob & Webster, 2003; Kennedy, 2009). In fact, many politicians and policy makers advocate that imprisonment is an effective deterrent, which serves to teach offenders that "crime does not pay" (see Cullen & Jonson, 2012; Cullen, Jonson, & Nagin, 2011).

The basis of this theory rests on the notion that people make calculated, rational decisions based on a cost-benefit analysis of whether or not to engage in certain behaviors (Cullen, Pratt, Micelli, & Moon, 2002). It follows that if the consequences of engaging in antisocial behavior are certain, swift, and severe enough to outweigh the reward obtained from engaging in crime, people will simply choose not to engage in such acts (Paternoster, 1987). There is an extensive literature written on deterrence, some of which supports the view that punishment improves outcomes (Nagin, 1998; Reynolds, 1997), some that punishment leads to worse outcomes (Gendreau, Goggin, Cullen, & Andrews, 2000; Smith, Goggin, & Gendreau, 2002), and yet some that punishment has no effect on outcomes (Pratt, Cullen, Blevins, Daigle, & Madensen, 2006).

In his review of the criminal deterrence research, Nagin (1998) asserted his confidence that the U.S. criminal justice punishments (i.e., imprisonment) effectively achieve a "substantial deterrent effect" (p. 36). Supporters of this position have also suggested that it was the increase in the odds of being incarcerated for serious offenses in the 1980s and 1990s that was responsible for decreasing the national crime rate (Reynolds, 1997). However, the research in support of punishment has also largely been based on examinations of aggregate data, which has been known inflate effect size estimates and lead to erroneous conclusions (Freedman, Pisani, Purves, & Adhikari, 1991; Gendreau & Smith, 2007). Further, there are also some aggregate-level examinations of the U.S. crime and imprisonment rates have found no evidence of any deterrent effect (e.g., Lynch, 1999).

In a systematic review of the literature on the effects of imprisonment, Gendreau et al. (2000) concluded, "clearly, the prison deterrent hypothesis is not supported" (p. 13). Gendreau et al. (2000) found that across all of the studies examined incarceration resulted in a 7% increase in recidivism compared to community sanctions. However, it should also be noted that the weighted effect size of this estimate was zero, indicating no difference in recidivism for the incarcerated versus community sanction groups. In a follow-up study, Smith et al. (2002) reached a similar conclusion, with one important difference. Smith et al. (2002) discovered that when their analyses were limited to only high quality studies the criminogenic effect of imprisonment was 11% (and a weighted mean ES of 8%). In a meta-analysis including 200 effect size estimates, Pratt et al. (2006) assessed the empirical status of the deterrence theory and found that the extent of the effects of the variables that are specified by the deterrent perspective (i.e., certainty, severity, composite, non-legal sanction) were weak at best, especially in studies that employ more rigorous research designs.

One of the key findings from the last 30 years of deterrence research is that the effect of incarceration on outcomes varies according to several moderating factors. That is, people respond differently to punishment. It has been suggested that deterrence works better for offenders who hold a strong bond to conventional society (Orsagh & Chen, 1988). Further, Orsagh and Chen (1988) also suggested a dosage paradigm for the effectiveness of deterrence. That is, too low of a dose (e.g., too little time served) would produce iatrogenic effects, whereas too high of a dose (e.g., too much time served) would also produce such negative effects. Thus, the goal of specific deterrence is to identify the precise dosage level that will achieve the best results (thus deterrence has a U-shaped function of effectiveness). Finally, some have even advocated that deterrence has a greater influence on behavior when the strains associated with prison life (e.g., restrictive conditions, physical punishment) are made much higher (Stubblefield, 2002; see also Gendreau & Goggin, 2013, p. 764; and Listwan, Sullivan, Agnew, Cullen, & Colvin, 2013).

Others have been critical of the deterrence theory because it fails to incorporate the knowledge from the effectiveness of punishment literature, which has been well known in the field of psychology for more than 50 years (Andrews & Bonta, 2010; Huessman & Podolski, 2003). Rather, criminologists have reduced deterrence to a simple "costs" versus "rewards" equation (see Gendreau, Smith, & French, 2006). However, the assumption that offenders are capable of making rational decisions disregards the fact that many of them simply do not weigh the pros and cons of engaging in a behavior before acting (Wilson & Abrahamse, 1992). Further, it has been found that offenders often overestimate the rewards of crime and underestimate the chances of being caught (Nagin & Pogarsky, 2004).

If deterrence were to work in reducing criminal behavior, criminologists must first ensure that the conditions for effective punishment are followed (see Andrews & Bonta, 2010; Azrin & Holz, 1966; Church, 1963; Gendreau et al., 2006; Matson & DiLorenzo, 1984). Matson and DiLorenzo (1984) identified 14 elements that must be fulfilled in order to ensure the maximal effect of punishment (e.g., escape from the punishing stimulus should be impossible, the punishing stimulus should be intense, the punishing stimulus should be delivered at every occurrence of the targeted behavior, the punishing stimulus should be administered immediately after the response). Intensity, immediacy, and certainty have been described as the three of the most important factors for the suppression of any behavior (Van Houten, 1983). Therefore, punishment must be administered immediately with maximum intensity at every occurrence of the target behavior (Azrin & Holz, 1966; Matson & DiLorenzo, 1984). The application of a low intensity punishment runs the risk that an offender may become tolerant of the unpleasantness of the response (Solomon, 1964). Further, any delay between the behavior and the punishment provides opportunities for the behavior to be reinforced prior to the delivery of the punishment (Skinner, 1953). Finally, when an undesirable behavior goes unpunished, this is itself a reinforcement of the behavior (Dinsmoor, 1998).

It is possible that the meta-analyses of the criminological deterrence literature (e.g., Gendreau et al., 2000; Smith et al., 2002; Pratt et al., 2006) do not find the strategy is effective because the U.S. criminal justice system does not adhere to these fundamental conditions of punishment (see Gendreau et al., 2006). For example, offenders typically receive relatively minor sentences for first time offenses, and the sanctions are then increased with each successive crime committed. Further, it is not uncommon for offenders to wait months, or even years, from the date of the offense until the disposition of a sentence. Finally, the offender must be caught at

every commission of a crime in order to eliminate the possibility for the reinforcement of unwanted behaviors. In short, if deterrence were to be an effective correctional policy, the criminal justice system would have to adhere more strongly to the guidelines for effective punishment. However, the transformation necessary for this to occur would require major changes within justice system (e.g., increase detection of illegal behavior, minimize the time from offense to sentence, apply intense punishments at every occurrence of the unwanted behavior).

Prison as a "school of crime". The "school of crime" theory predicts an effect of incarceration that is directly opposite to that of the prison as punishment perspective. According to this viewpoint, prison environments are "graduate schools" for crime, which confer to inmates the ultimate degree in criminal attitudes and behaviors (see Gendreau & Goggin, 2013). This process, also known as *prisonization*, has been described as "the taking on, in a greater or lesser degree, of the folkways, customs, and general culture of the penitentiary" (Clemmer, 1940, p. 279; see also Sykes, 1958). Thus, the experience of prison has the unanticipated consequence of deepening illegal involvement and making society less safe (Cullen et al., 2011). Moreover, the longer the period of imprisonment, the greater the extent of criminal skill that is acquired (Jaman, Dickover, & Bennett, 1972). This view has been widely accepted by many criminal justice professionals, and some segments of the public, the media, and political officials (Cullen, Fisher, & Applegate, 2000; Lilly et al., 2011).

There are a number of criminological theories encapsulated within the schools of crime position, including differential association, social learning, general strain, labeling, and self-control (Agnew, 2006; Akers, 2009; Akers & Sellers, 2009; Cullen & Agnew, 2011; Hirschi,

1969; Jacoby, 1979; Kubrin et al., 2009; Lilly et al., 2011). In Bukstel and Kilmann's (1980) classic review of the prison literature, they describe evidence of "overwhelming positive reinforcement" (p. 472) by other inmates and staff for a variety of antisocial behaviors. There have been several well-designed longitudinal studies (e.g., Nieuwbeerta, Nagin, & Blokland, 2009; Smith, 2006; Spohn & Holleran, 2002) that have compared offender outcomes after serving time in prison versus being placed on community sanctions, which have generally indicated that prison increases recidivism and makes prison adjustment worse (e.g., increases misconducts).

To illustrate, Spohn and Holleran (2002) examined data from offenders convicted of felonies in Jackson County, Missouri in 1993. In this study, the recidivism rates for the offenders assigned to probation (n = 776) were compared to those for the offenders sent to prison (n = 301). Spohn and Holleran (2002) found that being sent to prison was associated with increased recidivism and that those incarcerated reoffended more quickly than those placed on probation. In another study, Smith (2006) examined the impact of incarceration on a sample of 5,469 inmates serving time in the Correctional Service of Canada federal prison system. One of the major findings of her study was that low-risk offenders were adversely affected by the prison experience. That is, low-risk inmates had drastic increases in recidivism after being exposed to the prison environment. Finally, Nieuwbeerta et al. (2009) compared the recidivism rates of 1,475 men imprisoned in the Netherlands to a control group of 1,315 offenders who were convicted of crimes, but were not incarcerated. Over the three-year follow-up, Nieuwbeerta et al. (2009) reported that imprisonment was associated with increased criminal activity across all of the offense types examined.

In the largest scale review of the imprisonment literature to date, Jonson (2010) meta-analyzed 57 studies that produced 177 separate effect sizes. In this quantitative synthesis of the literature, Jonson (2010) discovered that on average custodial sanctions were associated with a 14% increase in recidivism compared to non-custodial sanctions. Further, even when her analyses were limited to only the strongest of methodological designs (i.e., randomized or matching), custodial sanctions were still associated with a 5% increase in reoffending.

It would be tempting to conclude that all inmates unequivocally experience an increase in criminogenic risk when exposed to the prison environment; however, the extensive research in this area indicates there is a more complicated relationship whereby the negative effects of incarceration appear to be moderated to a large extent by lower inmate risk levels and harsher prison life conditions (Gaes & Camp, 2009; Jonson, 2010; Smith, 2006). There is also extensive meta-analytic support found for the risk principle in the correctional rehabilitation literature (see Andrews & Bonta, 2010; Andrews, Zinger et al., 1990; Dowden & Andrews, 1999a; 1999b; 2000). That is, correctional interventions work best when targeted at higher risk offenders and can actually cause iatrogenic effects (e.g., increase recidivism) when applied to low-risk offenders (Andrews, Bonta, & Hoge, 1990; Lowenkamp, Latessa, & Holsinger, 2006).

Prison as a "behavioral deep freeze". The "behavioral deep freeze" theory evolved from what was known as the importation model (see DeLisi, Trulson, Marquart, Drury, & Kosloski 2011, p. 1187; and Thomas, 1977; Thomas & Foster, 1973). According to this perspective, the characteristics an offender brings into prison (e.g., antisocial attitude, on-going community ties, post-prison expectations) largely determine his or her behavior while in prison. Framed in the language of coping theory, Zamble and Porporino (1988; 1990) asserted that

inmates who cope poorly in prison have typically demonstrated inadequate coping skills throughout much of their lifespan (see also Porporino & Zamble, 1984). This view submits that prisons are relatively neutral environments and describes inmate behavior as an extension of their previously held values and motivations where preprison socialization factors influence adaptation and behavior (Irwin, 1980; Irwin & Cressey, 1962).

The evidence in support of this theory comes from a number of studies with large sample sizes using cross-sectional and longitudinal designs ranging from brief periods of several months to more than 10 years that assessed inmate adjustment to prison life. On the basis of this literature, as well as his work with Porporino, Zamble (1992) concluded that the "the most striking result was in the total absence of any evidence for general or widespread deteriorative effects" of incarceration (p. 420). Subsequently, two reports have appeared that are in agreement with Zamble's (1992) conclusion. Walker et al. (2014) narrative review of ten prison studies found that offenders reported mental health problems upon first entering prison, but in seven of the ten studies an improvement in mental state over time was reported. Two studies reported little change in mental health status and one study showed an increase in mental health problems. R. Bauer's (2012) cross-sectional study found mixed results; some inmates responded poorly to incarceration, while others adjusted quite well (see also Labrecque et al., 2013; and Morgan et al., 2014).

In an experimental study in California, Camp and Gaes (2005) examined whether different intensities of incarceration were responsible for making inmates more criminal. This study included 561 male inmates with similar classification scores, which indicated they were at equal risk for engaging in institutional misconduct. One half of these inmates were assigned to a Level I prison (lowest security level) and the other half were sent to a Level III prison (one step

down from the highest security level). Camp and Gaes (2005) found inmates were equally likely to engage in misconduct regardless of treatment condition assigned. The findings of this study indicate that the prison environment does not influence inmate criminal behavior.

In a retrospective study involving 3,039 inmates in a male medium security facility located in the northeastern part of the U.S., Walters and Crawford (2013) investigated whether importation factors predicted prison misconduct and post-release recidivism. Walters and Crawford (2013) reported the importation variables examined (i.e., age, marital status, street gang affiliation, criminal thinking, prior drug abuse, and criminal history) predicted higher-level institutional infractions (i.e., assault, escape, fighting, and possession of intoxicants) and recidivism measures (i.e., arrest for assault, arrests for robbery), but failed to predict lower-level infractions (i.e., refusing programs and stealing) and recidivism measures (i.e., arrests for driving under the influence, arrests for failing to appear in court).

There have also been meta-analytic reviews to support this position. For example, in an investigation including 23 studies and 27 effect sizes, Villettaz, Killias, and Zoder (2006) found that custodial sanctions were associated with reduced reoffending compared to noncustodial sanctions in only two of the comparisons, increased reoffending in 11 comparisons, and there was no difference in reoffending in 14 of the comparisons. When the results from four randomized experiments and one natural experiment identified in this study were meta-analyzed, Villettaz et al. (2006) found that "custodial and non-custodial sanctions do not differ significantly regarding recidivism beyond a random effect" (p. 33). In another review, Nagin, Cullen, and Johnson (2009) examined 48 studies (6 experimental/quasi-experimental, 11 matching, 31 regression-based) and similarly concluded that incarceration has a null or slight criminogenic effect on recidivism.

There are also two subsets of prison life research that lends support toward the "deep freeze" perspective. The first has been conducted on the effects of crowded prison living conditions, which should, ostensibly, result in greater levels of inmate distress than living in prisons that have adequate housing space. In a meta-analysis of this literature, Bonta and Gendreau (1990) concluded that crowding correlated weakly ($r < .10$) with acting out behaviors (e.g., assaults, misconducts). Subsequently, a meta-analysis by Franklin, Cortney, Franklin, and Pratt (2006) on the effects of crowding replicated these results ($r = .07$). It has been suggested that unless crowding is a chronic problem in the prison, it is likely that other factors such as management style, staff case management practices, abrupt changes in prison population involving younger inmates, inmates perceptions of control and "feelings" of being crowded may moderate the effect sizes reported above (Bonta & Gendreau, 1990; Franklin et al., 2006; Steiner & Wooldredge, 2008a; Wooldredge & Steiner, 2009).

The second subset of prison research that offers insight into the behavioral deep freeze perspective involves the study of the effects of institutional climate on inmate behavior. In a study in the Canadian federal prison system, Goggin (2008) analyzed data from a survey of inmates ($N = 4,285$) and staff ($N = 3,595$) on their ratings of the quality of life in prison and what she called the "personality" of the prison. The survey items included 22 domains that sought to uncover how well the prison functioned (e.g., security and safety, living and working conditions, quality of programs). The results of Goggin's (2008) analysis suggested that inmates in prisons that were rated worse on quality of life had similar rates of institutional misconduct and post-release recidivism as those from prisons rated higher in quality.

In conclusion, knowledge of these three theories is an important first step for gaining a better understanding of what effect the prison environment may have on criminal behavior. The

prison as punishment position has little available empirical justification, whereas the school of crime and behavioral deep freeze perspectives each has a reasonable amount of empirical support. It must be cautioned however that even though the empirical evidence seems to support the notion that prisons have a modest to no influence on recidivism, the research in this area is still left wanting. Many of the studies in this area are simply not of strong methodological quality, leading many researchers to highlight the urgent need for more high quality research (Cullen et al., 2011; Gendreau et al., 2000; Jonson, 2010; Nagin et al., 2009; Smith et al., 2002; Villettaz et al., 2006).

It must also be recognized that the deterrent perspective suggests the magnitude of the effects of prison on behavior will be greater when inmates are exposed to more harsh and painful environments, as opposed to when they are housed in so-called "country-club institutions" (Listwan et al., 2013, p. 145). There are some deterrent advocates who contend that modern prisons have simply become too soft (e.g., Finn, 1996; Newman, 1983; Nossiter, 1994; Rogers, 1993). Accordingly, proponents of this ideology believe deterrence will not work unless prisons adopt a more punitive philosophy. These prisons would provide fewer amenities (e.g., recreation, programing, schooling, TV, visits; see Finn, 1996; and Nossiter, 1994). Some have even gone so far as to plea for the use of corporal punishment on inmates (Newman, 1983) and yet others advocate for a return to the Pennsylvania solitary model restricting offenders to a cell for 24 hours a day in silence (Rogers, 1993). Proponents of "no-frills" prisons (e.g., Rogers, 1993) suggest that if prisons were made more restrictive there would be better outcomes (i.e., reduced misconduct, recidivism). Given this contention that prison must be a harsh experience in order to achieve such desired outcomes, this study now examines the research on the effects of the most severe and restrictive setting available in the modern day prison system, SC.

The Solitary Confinement Debate in Historical Context

Solitary confinement (SC) has been used as a means of controlling inmate behavior since the inception of the first prison (Foucault, 1995). Solitary confinement has been the prison's answer for dealing with difficult to manage inmates within the institution, just as prison is society's solution for dealing with criminals in the community. Corrections officials use SC to physically separate (or isolate) inmates from the general population of offenders for both disciplinary and administrative purposes. The practice of SC has been described as the isolation of inmates in closed cells for 22 to 24 hours a day, which can last for periods of time ranging from days to several years (Lanes, 2011). Inmate movement is severely restricted in SC and all personal contact—even with staff—is minimal. Family members are sometimes allowed to visit inmates in SC units, but there is almost always a physical barrier to separate the inmate from his/her visitor(s). Finally, SC units typically have limited or no access to educational or recreational activities or other sources of mental stimulation (Fellner, 2000). By comparison, the regular living conditions within prisons or jails (i.e., general population) provide inmates with access to various activities (e.g., programming, recreation, shared meals), which can afford a higher degree of social interaction.

There is an implicit assumption made through the use of SC that it is an effective strategy for making prisons and communities safer. In order to achieve this desired goal, SC functions by placing severe auditory, visual, and kinesthetic stimulation restrictions on offenders (see Gendreau & Labrecque, in press). However, this practice is of course not without its critics, who argue that SC violates prisoners' constitutional rights, contributes to psychological problems, increases criminogenic risk, and is expensive (e.g., Cloyes et al., 2006; Fellner & Mariner, 1997; Grassian, 1983; Grassian & Friedman, 1986; Haney, 1993; 2003; 2008; Jackson, 1983; 2001;

Lucas, 1976; Scharff-Smith, 2006; Shalev, 2008; White, 2014). The merits of SC have been debated for centuries (see the reviews by Haney, 1997; and Scharff-Smith, 2006) and despite its recent increase in popularity in the U.S. (Haney, 2008; King, 1999; O'Keefe, 2008), this practice remains a core issue in the field of corrections.

The main criticism of SC has long been that it causes inhabitants undue psychological distress (Grassian, 1983; Haney, 2003) and, by extension, it also increases one's propensity for criminal behavior (see Mears & Watson, 2006; Pizarro et al., 2006; Toch & Kupers, 2007). These sentiments toward SC date back to the early nineteenth century, when after touring some of the U.S. penitentiaries, several notable European contemporaries became critically outspoken about the practice. For example, Dickens (1842/1985), who visited the Eastern State Penitentiary in Pennsylvania in the 1840s, described the suffering in SC as "immeasurably worse than any torture of the body" (p. 124). Further it was his belief that isolation was something "no man [should have] the right to inflict upon his fellow creature" (p. 124). Similarly, after visiting a congregate style prison in Cincinnati, de Beaumont and de Tocqueville (1833) found that half of the prisoners were shackled in irons, "put into chains like ferocious beasts," and the rest were "plunged into an infected dungeon" (p. 13). They described the silence in the prison as an "unnatural solitude", something they equated with "that of death" (p. 32). It was the opinion of de Beaumont and de Tocqueville (1833) that prisoners held in isolation in penitentiaries such as these would have no hopes of reformation; rather they would be forced to reenter society morally unhealthy and diseased.

The U.S. Supreme Court agreed that SC was responsible for producing harmful effects on inmates' psychological health when it ruled SC was too severe of a punishment to serve any legitimate purposes (see *In re Medley*, 1890). As a result, SC was no longer to be universally

applied to all inmates in custody; rather, it was to be reserved only for those whom other methods of discipline proved ineffective (Miller, 1980). As the use of SC was reduced in many prison systems across the country, so too were the debates over its reputed harmfulness. However, several events in the twentieth century led to resurgence in attention over the effects of SC.

The role of sensory deprivation in solitary confinement research. In the 1960s, federal prison officials from the Canadian Penitentiary Service (presently the Correctional Service of Canada) raised the issue of the potential harmful effects of SC. These concerns were largely a response to the results of the Donald Hebb group sensory deprivation (SD) experiments that took place at the McGill University during the 1950s (see Brown, 2007; McCoy, 2006; and Mechanic, 2012). In these studies, college students were used as test subjects to examine the effect that restricted environmental conditions had on various physiological and psychological outcomes (e.g., Arnhoff, Leon, & Brownfield, 1962; Bexton, Heron, & Scott, 1954; Heron, Doane, & Scott, 1956; Scott, Bexton, Heron, & Doane, 1959; Suedfeld, Grissom, & Vernon, 1964; Vernon & Hoffman, 1956; Vernon & McGill, 1957; Zubek, 1964; Zubek, Bayer, Milstein, & Shephard, 1969; Zubek, Bayer, & Shephard, 1969; Zubek, Shephard, & Milstein, 1970). One of the early McGill studies reported its subjects suffered from dramatic cognitive deterioration and perceptual impairment within a relatively short time (2-3 days; Bexton et al., 1954).

It has been speculated that the results of the early McGill experiments were inflated due to participant response biases (Orne, 1962). In support of this position, two studies showed that strong placebo effects could occur when great care was not taken as to how to elicit information from participants in isolation research (see Jackson & Kelly, 1962; and Orne & Scheibe, 1964).

The first study by Jackson and Kelly (1962) subjected 14 students to an hour of perceptual monotonous conditions. The test subjects were warned to anticipate unusual effects and were administered a placebo hallucinogen they were told might facilitate these experiences. All students reported marked visual, auditory, somesthetic, emotional, and cognitive distortions of reality. Some thought their hallucinations were real.

The second study, by Orne and Scheibe (1964), revealed similar findings were reported *without* employing perceptual monotony or restricted environmental stimulation. All the experimenters had to do to produce results comparable to those found at McGill was to manipulate non-SD features of the environment such as the dress and demeanor of the experimenter, material in the room, a medical tray full of various items, and provide a panic button in case participants felt they might be vulnerable to becoming distressed. The control group, meanwhile, was not subjected to any of these procedures while placed under the McGill-like perceptual monotony conditions. Reported symptoms among controls were three times less than that of the experimental group.

By the early 1970s, several hundred SD experiments had been conducted. In 1975, Suedfeld conducted a comprehensive review of the findings of the SD literature, involving more than 3,300 subjects of widely varying backgrounds.[1] Suedfeld (1975) concluded that although some subjects reacted negatively to SD conditions, "one rarely finds, particularly in more recent studies, extreme emotionality, anger, and anxiety" (p. 62). There are obvious concerns about generalizing the results from non-prison SD environments to prison SC settings, including the use of volunteer, university students as subjects, and the differences in duration and severity of exposure to conditions (see Suedfeld et al., 1982; and Zinger et al., 2001). However, it should be

[1] The interested reader may also consult the prior reviews of this literature by Goldberger (1966), Myers (1964), Myers (1969), Rasmussen (1973), Zubek (1969), and Zuckerman (1962). It should be noted that this group of works reached similar conclusions to that of Suedfeld (1975).

noted that the findings in the non-prison SD experimental literature were later corroborated by studies conducted on inmates in prison SC settings (e.g., Ecclestone, Gendreau, & Knox, 1974; Gendreau, Freedman, Wilde, & Scott, 1968; 1972; Gendreau, Horton et al., 1968; Gendreau, McLean, Parsons, Drake, & Ecclestone, 1970).

In a series of experimental studies, Gendreau and his colleagues examined the effects of SC on a variety of physiological outcomes. These studies generally used relatively small samples (16 to 20) of volunteer male inmates who were randomly assigned to either a SC or general prison life condition. Gendreau, Horton et al. (1968) reported no significant differences in perceptual abilities between groups after seven days of confinement. Gendreau, Freedman et al. (1968) found that after seven days in SC inmates sought lower levels of visual input and similar levels of auditory input compared to controls. Gendreau et al. (1970) discovered no significant difference on conditioned discriminative eyelid response frequency and topography between SC and non-SC inmates immediately after release from SC and up to seven days later.

In another study, Gendreau et al. (1972) indicated that one-week of SC produced significant changes in offender electroencephalography (EEG) and visual evoked potential (VEP) levels. Finally, in assessing the adrenocortical function (i.e., plasma cortisol levels) between SC and non-SC inmates after 10 days of confinement, Ecclestone et al. (1974) found that SC was no more stressful than was normal institutional life. The findings from this group of studies parallel those reported in the non-prison post-McGill SD findings (e.g., lowered sensory arousal/cortical arousal, need for sensory stimulation, lower stress levels). Therefore, it has been suggested that the conclusions drawn from the SD studies should also pertain to SC (see Gendreau & Thériault, 2011).

By the close of the 1970s, it seemed all but a foregone conclusion that conditions of SD (and therefore SC) were responsible for producing only weak negative effects. In a study of 115 inmates in five U.S. and Canadian prisons, Suedfeld et al. (1982) affirmed this position by concluding that the conditions of SC were not overwhelmingly aversive, stressful, or damaging to inmates. Rather, Suedfeld et al. (1982) found that only as one's time in SC increased were slight increases noted on the measures of inhibition, anxiety, lack of self-insight, submissiveness, depression, and hostility. This conclusion, however, did not remain unchallenged for long.

Growing concerns about the effects of solitary confinement. In 1983, Grassian described his psychiatric assessment of 14 inmates in SC at the Walpole Prison in Massachusetts. Grassian (1983) reported these inmates suffered from massive free-floating anxiety, aggressive fantasies, and paranoia, amongst other responses. Grassian (1983) concluded that SC not only produces substantial psychopathological effects, but also that these effects form a "clinically distinguishable syndrome" (p. 1450). This study became an instant classic in the field and revived the belief that SC produces debilitating psychological effects.

In the more than three decades since the Grassian (1983) publication, a number of researchers have conducted qualitative research involving interviews with inmates and mental health professionals in SC settings (e.g., S. Bauer, 2012; Benjamin & Lux, 1975; Beth-Pheiffer, 2004; Brodsky & Scogin, 1988; Haney, 2003; Jackson, 1983; 2001; Korn, 1988a; 1988b; Kupers, 2008; Lovell, 2008). As a group, these reports tend to use powerful excerpts from these interviews to suggest that SC "significantly impairs the mental health of prisoners" (Toch, 2003, p. 221; see also Haney, 2009; Kupers, 2008; Lovell, 2008; Scharff-Smith, 2006). Subsequently, there has become a strong consensus in the literature, as well as a growing public sentiment, that

SC is responsible for producing devastating effects (e.g., anger, anxiety, cognitive impairment, depression, psychosis, social withdrawal; Haney, 2012a; Kupers, 2008; Lovell, 2008; Rhodes, 2002; 2004; 2005a; Scharff-Smith, 2006).

Popular accounts describe the SC setting as a "hellhole" and equate the practice to a form of torture (Gawande, 2009). What is more, this line of research is often used by the media (e.g., Gawande, 2009; Guenther, 2012; Keim, 2013) and other human rights organizations (e.g., Human Rights Watch, Solitary Watch, American Friends Service Committee) as the "evidence" that proves SC is psychologically damaging (see Fellner, 2000; Fellner & Mariner, 1997; Isaacs & Lowen, 2007). Reviewers in these venues often treat the conclusions from these qualitative investigations at face value, and are either ignorant or unconcerned about the limitations in research design (e.g., selection bias, response bias, non-existent or inadequate comparison groups, cross-sectional designs, clinical observation and/or self-report rather than objective measures).

Others, however, have pointed to the methodological shortcomings of these qualitative studies, which in their estimation limit the generalizability of the results (e.g., Gendreau & Bonta, 1984; Gendreau & Labrecque, in press; Glancy & Murray, 2006; Hanson, 2011; Suedfeld, 1984; Suedfeld et al., 1982; Zinger et al., 2001). For example, it is worth noting that the 14 inmates included in the Grassian (1983) study were under a class action lawsuit against the Massachusetts Department of Corrections during the time of their interviews. It has therefore been suggested that these inmates had much to gain by responding negatively to the interviewers questions (see Suedfeld et al., 1982). It is also important to note that Grassian (1983) made no mention for how he accounted for response bias factors in his investigation. In fact, Grassian (1983) encouraged response bias, commenting in his article that some inmates did not seem to be

aware of the dire stress they were experiencing so they had to be prompted to divulge the appropriate symptoms.

Finally, while it has been well established that inmates with mental illness are often over-representative in SC units (Andersen et al., 2000; Andersen, Sestoft, Lillebaek, Gabrielsen, & Kramp, 1996; Bottos, 2007; Hodgins & Côté, 1991; Lovell, 2008; Motiuk & Blanchette, 1997; O'Keefe, 2008; Wormith, Tellier, & Gendreau, 1988; Zinger et al., 2001), many of the qualitative reviews in this area often fail to use, or use an inadequate, control group. Therefore, these studies are not able separate pre-existing mental health symptoms from those conditions that are a result of the experience of SC (see Gendreau & Bonta, 1984).

Ironically, the belief that SC is extremely damaging has proliferated even though there have been several empirical studies that countered this point of view (O'Keefe et al., 2010; O'Keefe et al., 2013; Motiuk & Blanchette, 2001; Zinger et al., 2001). One such recent study, conducted in Colorado by O'Keefe et al. (2010), which was later published in the *Journal of the American Academy of Psychiatry and the Law* (O'Keefe et al., 2013), has become quite infamous in the view of those who oppose SC (see Metzner & O'Keefe, 2011). The Colorado study used a quasi-experimental repeated measures design, and assessed inmates (n = 247) over a one-year period on 12 psychological assessments (O'Keefe et al., 2013). The results of the Colorado study indicated little effect or a decline in symptomology for the majority of the inmates in the SC condition (Berger, Chaplin, & Trestman, 2013). Further, there was an escalation in psychological problems noted in only 7% of the sample (Metzner & O'Keefe, 2011).

Soon after its publication, however, the professional competency and ethics of the Colorado researchers came under fire from those who disputed the findings (e.g., Lovell & Toch,

2011; Grassian, 2010; Grassian & Kupers, 2011; Scharff-Smith, 2011). For example, Grassian (2010) accused O'Keefe et al. of gross incompetency for producing "garbage in and out" results (p. 4). Among the many concerns raised, Grassian (2010) criticized the choice to exclude illiterate inmates and those who refused to participate, as well as the use of self-report rating scales to measure psychological outcomes. Scharff-Smith (2011) has suggested that the use of a female university employee with an undergraduate degree to collect data, rather than a health practitioner or Ph.D. level researcher with experience doing research means that the data collected are unreliable. Further, Grassian and Kupers (2011) even go so far as to suggest the findings of this study were biased because of the "attractiveness" of this investigator, which apparently intimidated inmates from revealing their "real" feelings so as to protect their own self-worth. These criticisms also sought to make sure that "no general policy conclusions should be drawn from this study" (Lovell & Toch, 2011, p. 15).

This example highlights some of the current challenges that exist in attempting to objectively evaluate the effects of SC. When the O'Keefe et al. (2010) study produced results that were counterintuitive to the dominant position regarding the effects of SC; those who opposed its findings vehemently attacked the credibility of the study. This reaction makes it clear that people feel very strongly about this issue. It appears as though some researchers are so entrenched in their beliefs that when presented with evidence that counters their point of view they resort to making every attempt at belittling its worth. These criticisms are characteristic of standard knowledge destruction techniques commonly used in corrections where information is accepted and/or rejected according to moral and/or personal values, raising suspicions about errors in measurement, and claiming a phenomenological enquiry is superior because human experience cannot be captured by checklist measures (e.g., the Beck Hopelessness Scale and the

Brief Psychiatric Rating Scale) even if they are well validated (see Andrews & Bonta, 2010; Andrews & Wormith, 1989; Gendreau, 1995).

Others have rallied to the support of the Colorado team, describing their study as an outstanding example of psychology research (Gendreau & Labrecque, in press). The Colorado researchers provided a cogent defense of their methodology and discussed the limitations of their research (see O'Keefe, Klebe, Metzner, Dvoskin, & Fellner, 2011). It has also been noted that none of the work cited by those who contend SC produces serious psychological trauma comes close to the Colorado study in terms of methodological rigor (see Gendreau & Thériault, 2011; Hanson, 2011).

Opposing viewpoints. There are three theoretical perspectives that have emerged from the general prison life literature that have commented on the practical utility of SC as an effective means to control inmate behaviors (Gendreau & Labrecque, in press). The first position (*prison as punishment*), which comes out of the longstanding "mean streets" criminal justice policies in the U.S. (see Cullen, 1995 for a review), claims SC—as the most severe form of incarceration available in the U.S.—should produce reductions in criminal behavior (i.e., institutional misconducts, post-release recidivism; Stubblefield, 2002). In fact, the conventional wisdom amongst some prison authorities (e.g., prison wardens) is that SC not only increases safety in prisons, but will also deter criminal behavior upon release (Angelone, 1999; Gavora, 1996a; 1996b; see also Mears & Castro, 2006). Proponents of this view hold that because SC involves fewer privileges and more restrictions, inmates who are released from such settings into the general prison population will refrain from disruptive behavior out of fear that they will be returned. A rationale that is often used to support its use is SC segregates the most dangerous

(and most vulnerable) inmates to protect the prison staff members and inmate populations (see Pizarro & Stenius, 2004).

In contrast to the above, the second perspective (*prison as a school of crime*) suggests SC further adds to the pains of imprisonment (Haney, 2012b). Proponents of this view maintain that most inmates exposed to SC will experience undue psychological stress (Benjamin & Lux, 1977; Fellner, 2000; Grassian, 1983; Haney, 2012a; Jackson, 1983; Scharff-Smith, 2006), which can, in very short time periods result in "lasting emotional damage, if not full-blown psychosis and functional disability" (Kupers, 2008, p. 1006; see also Chowdhry, 2014). Proponents of this view have insisted that SC not only causes serious health problems but also leads to increases in antisocial thinking and criminal involvement (see Mears & Watson, 2006). Proponents contend that the harsh conditions and idleness of SC make inmates more disturbed, hardened, and disruptive, which thereby makes them even more difficult to manage when they are released either in the general prison population or in the community (Gordon, 2014; Hartman, 2008; Kupers, 2008; Lippke, 2004; McShane, 1989; Toch, 1982; Toch & Kupers, 2007).

Finally, a third viewpoint (*prison as a behavioral deep freeze*) is that SC produces much less intense effects than those suggested by Kupers (2008). Proponents of this position maintain that under conditions where prisons meet the standards of humane care, relatively few inmates are adversely affected (O'Keefe et al., 2010; Suedfeld et al., 1982; Wormith, 1984). Rather, there are other factors (e.g., how inmates are treated, conditions of confinement) in the prison environment—beyond simply being confined in a SC setting—that have more serious iatrogenic consequences (Bonta & Gendreau, 1990; Clements et al., 2007; Gendreau & Bonta, 1984; Gendreau & Goggin, 2013; Gendreau & Labrecque, in press; Gendreau & Thériault, 2011). Therefore, according to this view, SC will have little to no effect on inmate outcomes, including

criminal behavior (Gendreau & Goggin, 2013; Gendreau & Labrecque, in press). In order to take stock of what is known (and not known) about the effects of SC on inmate behavior, the empirical evidence will now be reviewed.

The effects of solitary confinement: A review of the empirical literature. In attempting to establish the validity of these three positions, this dissertation responds to Toch's (1984) call for a "science of imprisonment as well as a science of inmate reactions to imprisonment" (p. 514) by reviewing the empirical evidence on the effects of SC. Lacking strong empirical support, many of the recommendations from this research have been criticized for being based merely on "personal revulsion, unsupportable generalizations, or far-fetched arguments by analogy" (Suedfeld et al., 1982, p. 337). When compared to the results from narrative reviews that often lead to incorrect conclusions and imprecise estimations of the true magnitude of an effect, meta-analysis provides precise point estimates of the effect size (Beaman, 1991; Cooper & Hedges, 1994; Schmidt, 1992) and therefore, the results from a recent meta-analysis conducted by Labrecque et al. (2013) will be reviewed in order to assess whether or not SC is an effective correctional policy (see also Morgan et al., 2014). This review of the SC literature reveals four critical limitations. Each will now be discussed in detail.

First, despite the fact that SC has been used in U.S. prisons for centuries and has also remained a popular point of discussion—not only in the academic, but also professional circles—it has a rather unfortunate and unimpressive literature base. The Labrecque et al. (2013) meta-analysis found that of the 150 studies reviewed, only 14 (or 9.3%) were suitable for analysis according to the studies inclusion criteria. The inclusion criteria required only that the study took place in a correctional setting with prisoners, had a comparison group, and contained

sufficient data to calculate an ES. This finding suggests that the majority of the SC research is either (1) anecdotal and based largely on opinion, and/or (2) too methodological weak to draw valid conclusions from. The majority of this research suffers from issues related to selection bias, response bias, non-existent or inadequate comparison groups, cross-sectional designs, clinical observation and/or self-report rather than objective measures (see also Gendreau & Labrecque, in press). That is not to say that impressive studies do not exist, but rather that they are the exception and not the rule (e.g., Lovell et al., 2007; Mears & Bales, 2009; Morris, 2015; O'Keefe et al., 2010; Zinger et al., 2001).

Regardless of this fact, most reviews of the SC literature to date have relied on ideographic methods to summarize the findings and have tended to conclude that the practice is detrimental to the well being of inmates (see Baumgardner, 2011; Grassian & Friedman, 1986; Klykken, 2012; and Scharff-Smith, 2006). Even in the most frequently cited summary of this literature to date, Scharff-Smith (2006) used a simple vote counting method to summarize studies, a procedure that has historically led to substantial inaccuracies in summarizing the magnitude of effect sizes (Schmidt & Hunter, 2015). In this review, Scharff-Smith (2006) treated qualitative *and* quantitative studies at face value despite the fact that they were based on simple common sense heuristics (see Gendreau, Goggin, Cullen, & Paparozzi, 2002).[2] Scharff-Smith (2006) also included the Grassian (1983) and Haney (2003) studies in his review, despite the fact that the former did not include a comparison group and the latter compared his results to a non-prison non-offender sample, and neither study empirically assessed the previous mental health histories of the inmates in SC. Finally, Scharff-Smith (2006) did not report what criteria

[2] Examples of common sense arguments include relying on testimonials from authority, "what everybody knows" claims, resorting to explanation by naming, and accepting ideographic laws of behavior.

were used to distinguish between what constituted a minor versus serious effect. Such a review strategy makes it difficult to empirically evaluate the effect of SC.

Second, the vast majority of SC research has primarily concentrated on whether or not the practice produces any harmful physical or psychological effects (Labrecque & Smith, 2013). There have simply been far fewer empirical evaluations of behavioral outcomes compared to those that are physical or psychological in nature. To illustrate, of the 65 separate effect sizes (ESs) generated in the Labrecque et al. (2013) meta-analysis, 56 involved medical/physiological indicators (i.e., physical health, sensory arousal) or psychological indices (i.e., anger, hostility, anxiety, depression, psychosis, paranoid ideation, intelligence, cognitive impairment, somatization, coping, negative attitude, hypersensitivity, global functioning), while only nine involved behavioral outcomes (i.e., post-release recidivism, serious institutional misconduct). This suggests that most of what is known about the effects of SC involves its impact on medical/physiological and psychological outcomes, rather than on behavioral measures.

It is worth noting that although the majority of works written on the effects of SC have generally concluded that the practice contributes to several unintended consequences (i.e., increased mental illness, physiological abnormalities, increased hospitalization and suicide risk; Andersen et al., 2000; 2003; Brodsky & Scogin, 1988; Cloyes et al., 2006; Felthous, 1997; Grassian, 1983; Grassian & Friedman, 1986; Haney, 2003; Irwin, 2007; Kupers, 2008; Lanes, 2009; Lovell, 2008; Miller, 1994; Miller & Young, 1997; Rhodes, 2002; 2004; Sestoft et al., 1998; Way et al., 2007). Further, Haney (2012a) has contended that SC "heightens the risk of psychological damage for the prisoners subjected to it" and further that the "empirical research on solitary confinement has consistently documented [these] problematic effects" (p. 11). However, the Labrecque et al. (2013) quantitative synthesis of the empirical evidence did not

support the hypothesis that SC leads to significant deteriorative or aversive reactions.[3] Labrecque et al. (2013) reported the effect size for medical/physiological outcomes was moderate (r = .10 for physical health and r = .38 for sensory arousal). That is, there was a decrease found on the indices examined associated with the SC condition (i.e., lower blood pressure, lower sensory arousal). However, it was also noted that outcomes in this area have often been misinterpreted as evidence of detrimental effects. From a psychophysiological perspective, these results represent an appropriate bodily response to a restricted environmental condition (see Helson, 1964; Suedfeld, 1980; Zubek, 1969). Further, these results approximate the effect size estimates of the physiological outcomes found in the non-prison environment studies (see Suedfeld, 1975; 1980; Zubek, 1969).

The Labrecque et al. (2013) meta-analysis also revealed that the ESs for the psychological variables were rather modest, with nine of the 13 domains examined producing point estimates of r < .10. Further, the 95% confidence intervals (CI) for these estimates were also imprecise (CIs > .10, see Smithson, 2003), which was largely a product of the small sample sizes available in each of the domains examined (ranged from n = 179 to 474). Therefore, according to the available empirical research, SC may simply not be as devastating as it is often portrayed in the media and by some human rights organizations, activists, and scholars. Regardless, the small number of empirical studies available in this area indicates that much more research is needed before more definitive conclusions should be drawn. *Until such research is available, reviewers should be more cautious in making their judgments about the effects of SC.*

Third, there have been far fewer empirical evaluations of institutional misconduct compared to investigations of post-release recidivism. This is an interesting finding given that a

[3] It is worth mentioning that the Morgan et al. (2014) meta-analysis also reached the same conclusion.

national survey of prison wardens found that the majority (97%) of respondents identified increasing safety, order, and control throughout the prison system as the three main goals of SC, whilst fewer than 50% of respondents of this survey indicated that the role of SC was to rehabilitate or reduce recidivism (Mears & Castro, 2006).

The results from the Labrecque et al. (2013) meta-analysis indicate SC has a weak negative effect on post-release recidivism (r = .06, CI = .02, .10, k = 7, n = 4,636). However, it should also be noted that the SC recidivism studies vary in terms of methodology employed.[4] The first methodology type used to study the effects of SC is the nonequivalent comparison group design. In a study in the Correctional Service of Canada's (CSC) federal prison system, Motiuk and Blanchette (2001) compared the recidivism rates of a group of SC (n = 797) and randomly selected non-SC inmates from the general prison population (n = 801). Across both types of outcomes examined, offenders in the SC group were significantly more likely to be returned to federal custody (r = .10). Given the methodological design of this study, there is reason to suspect that prior group differences may have affected the results. For example, prior research suggests that inmates in SC are more likely than inmates in the general population to possess many characteristics (e.g., younger age, greater criminal histories, higher risk for recidivism) that placed them at greater likelihood for recidivating aside from the SC condition (Barak-Glantz, 1983; Lovell, Cloyes, Allen, & Rhodes, 2000; Mears & Bales, 2010), which may have had some bearing on the results.

In another nonequivalent comparison group recidivism study, Ward and Werlich (2003) examined the differences in the return to prison rates between a group of federal inmates released from Alcatraz (SC group) and a random subsample of inmates released from Leavenworth (non-

[4] For a summary of the methods and results from the empirical studies that have investigated behavioral indicators see Appendix A.

SC group) during the same time period (see also Ward, 2009). This study found that SC inmates were more likely to be returned to federal custody during follow-up, with approximately 50% of the inmates from Alcatraz (n = 1,550) returned to prison compared to only 37% of the inmates from Leavenworth (n = 257). However, it must also be understood that given the selection criteria of the two groups it is reasonable to suspect that there are underlying differences between the two groups that may have also had an influence on outcome (i.e., risk for recidivism, sentence length). To illustrate, the Alcatraz inmates had much more serious criminal histories (7.1% murder charges, 24% crimes against person, 17.7% bank robbery, 1.4% motor vehicle offense) compared to the Leavenworth inmates (1.9% murder charges, 5.4% crimes against person, 1.4% bank robbery, 22% motor vehicle offense), which may have influenced these results (D. Ward, personal communication, July 2, 2014).

Another method used to study the effects of SC was the matched comparison group design. In a couple of studies, Lovell and his colleagues examined the recidivism rates among supermax prisoners in Washington State (Lovell & Johnson, 2004; Lovell et al., 2007). Lovell et al. matched supermax prisoners (SC group) one-to-one with non-supermax prisoners (non-SC group) on mental illness status and eight other recidivism predictors (past felonies; past misdemeanors; first-time sex offender; greater than one institutional infraction per year; African American or Native American, Asian, Pacific Islander; felony versatility; index violent offense; age at release). Lovell and Johnson (2004) reported that supermax inmates were more likely to commit a new felony (r = .07) and a new personal offense (r = .13). Further, Lovell et al. (2007) found that although SC inmates were more likely than their non-SC matched comparisons to recidivate in general (r = .07), there was a much more distinct disadvantage for inmates who were directly released from supermax to the community (r = .19), compared to those who spent

three or more months in a general prison population setting after experiencing supermax prior to being released into the community (r = .02).

More recently, researchers have used propensity score matching to study the effects of SC. This matching procedure affords researchers the ability to ascertain a comparison group that is as close as possible to the SC group on the observable covariates (Rosenbaum & Rubin, 1983; Rubin, 2006). In a study that was completed in the Florida Department of Corrections (FDOC) state prison system, Mears and Bales (2009) examined the three-year recidivism outcomes between a group of supermax inmates who spent more than 90 days in a SC setting (n = 1,267) with a comparison group of inmates who were propensity score matched from larger pool of inmates in the FDOC system during the sampling time frame (n = 58,752). Although the differences found in outcome between the two groups for any recidivism was not significant (58.8% for supermax compared to 57.6% for non-supermax), SC inmates were significantly more likely to commit violent recidivism during follow-up than controls (24.2% for supermax compared to 20.5% for non-supermax). Mears and Bales (2009) found no evidence that duration in SC or the timing of release from SC had an effect on the outcomes examined.

In an outcome evaluation of the Ohio supermax prison, Butler, Steiner et al. (2013) also used propensity score analysis to match inmates in supermax (n = 52) to a control group of non-supermax inmates (n = 52). Inmates were matched on the characteristics of age, race, risk level, sentence type and severity, gang member status, sex offender, education and time served. Butler, Steiner et al. (2013) found that inmates exposed to the SC condition were both more likely have a new arrest (r = .10) and a new felony arrest (r = .14).

There have been only two empirical evaluations of the effects of SC on institutional misconduct (Briggs et al., 2003; Morris, 2015). The Briggs et al. (2003) aggregate-level study

found that states with supermax prisons had lower levels of inmate-on-inmate assaults (r = -.14) and inmate-on-staff assaults (r = -.01) than comparison states without supermax facilities. However, the findings from this study must be interpreted cautiously because aggregate level analyses have been known to inflate effect sizes (see Gendreau & Smith, 2007).

Another study, conducted by Morris (2015) used propensity score analysis to match inmates who were sent to SC after engaging in an initial act of violent behavior in prison to those who were not sent to SC after engaging in an initial act of violent behavior. Inmates were matched on social demographics (e.g., education, age, race, marital status, IQ), criminal history, institutional misconduct history, and prison unit demographics. Morris (2015) found that the use of short-term SC had no statistically significant effect on the engagement of subsequent violent misconduct (r = .01).

In conclusion, *the extent to which SC is responsible for influencing behavioral outcomes in prison remains an open empirical question*. Although there may be some tentative support for the contention that SC increases recidivism, much less is known empirically about how this practice influences inmate adjustment in prison. However, it is also important to note that there is an extensive amount of research that indicates prison misconducts predict post-release recidivism (Cochran, Mears, Bales, & Stewart, 2014; Gendreau & Goggin, 2013), and therefore it is likely that SC has a similar effect on both in prison and post prison behaviors.

Finally, it has been observed that the context in which SC is delivered has the potential to be very crucial to its effect on outcomes (Bonta & Gendreau, 1990). Unfortunately, there is very little information available on potential moderators in the current literature base. Further the data is virtually non-existent on offender characteristics (e.g., age, gender, race, risk, mental health status, risk for recidivism) and situational variables (e.g., physical conditions, officer-prisoner

relationships, how inmates are treated, institutional climate, reasons for being sent to SC, health care and treatment services, in cell provisions, access to outside contacts), which also have the potential to be powerful predictors of criminal behavior (Gendreau & Labrecque, in press; Lovell et al., 2000; Ross, Diamond, Liebling, & Saylor, 2008; Shalev & Lloyd, 2011; Steiner & Wooldredge, 2008b; Toch, 1977; Wooldredge, 1997). It makes little sense to search for the effects of SC without acknowledging that they may vary considerably across individuals (Porporino & Zamble, 1984). It is therefore crucial that studies in the future move beyond simply examining whether the prison environment influences outcomes across all offenders, toward an assessment of which subsets of individuals such sanctions may or may not be useful for achieving desired results (Piquero, Paternoster, Pogarsky, & Loughran, 2011).

Many reviewers have argued that the adverse effects of SC are especially significant for prisoners with serious preexisting mental illnesses (e.g., schizophrenia, bipolar disorder, major depressive disorder) and that the mentally ill are more likely to suffer the deleterious effects of such placement (Arrigo & Bullock, 2008, Coid et al., 2003a; 2003b; Cohen, 2008; Haney, 1993; Hartman, 2008; Hodgins & Côté, 1991; Kurki & Morris, 2001; Lovell, 2008; Metzner & Fellner, 2010; Morris, 1982). It has been suggested that the stress, lack of meaningful social contact, and unstructured days in SC exacerbate the symptoms of mental illness for these offenders (Abramsky & Fellner, 2003). The suffering of mentally ill inmates in SC is generally believed to be permanently disabling (see O'Keefe, 2007), although there have been very few empirical assessments that have addressed this question.

The O'Keefe et al. (2010) Colorado study separated the effect of SC on offenders based on the presence or absence of mental illness (defined as those with an Axis I and/or some Axis II diagnoses). O'Keefe et al. (2010) found that mental ill (MI) inmates had better outcomes

compared to non-mentally ill (NMI) inmates on seven of the 13 psychological constructs examined (as evidenced by a lower mean effect size). Similarly, in the 2004 Washington State recidivism study, Lovell and Johnson also separated the effect of SC on offenders based on the presence or absence of mental illness. Inmates were assigned to the MI group if they had previously been assigned this status in the prison system or met two of the following conditions: (1) qualifying diagnosis; (2) 30 days residential mental health unit residency; or (3) had a level of care code that indicated a need for regular psychotropic medication. Lovell and Johnson (2004) also found that although NMI inmates were more likely to commit a new felony during follow-up compared to their matched controls (SC = 47% compared to non-SC = 38%), the MI inmates in SC were actually less likely to recidivate compared to their matched controls (SC = 46% compared to non-SC = 50%).

The tentative evidence from these two studies does not support the popular contention that SC exacerbates the existing psychiatric conditions of inmates and produces increases in their criminogenic risk. Therefore, many the conclusions that have been drawn so far are perhaps premature and misleading. However, it is worth noting that although these two studies indicate MI offenders may be less adversely effected by SC than their NMI peers, there is no evidence to suggest that SC is a clinically appropriate strategy for dealing with MI offenders. There are far too few empirical evaluations in this area and more research is desperately needed in order to better understand what role mental illness plays in mediating the relationship between SC and outcomes.

It should also be noted that when the results of the Labrecque et al. (2013) meta-analysis were subdivided by design strength, studies with stronger designs had a significantly lower effect

size (r = .03, k = 41), compared to studies with weaker designs (r = .21, k = 24).[5] This finding reveals that there is far less of an effect of SC on outcomes when the differences are examined from more comparable groups. That is, when other known predictors of outcomes are included, SC appears to be less influential. This highlights the importance for not only using well matched control groups in the evaluation of SC, but also that there may be some differential effects of SC based on some of these characteristics. Future studies in this area simply must do a better job controlling for these variables. Next, the challenges and obstacles that must be overcome in order to evaluate SC as a correctional policy are examined.

Evaluating Solitary Confinement as a Correctional Policy

For any policy or practice to be effective, it helps considerably if it is grounded in a well-supported theory (Posavac, 2011; Rossi, Lipsey, & Freeman, 2004). The theory should explain what the policy seeks to achieve and provide a rationale for expecting the desired results. In contrast, when a policy lacks theoretical guidance, "there is little prospect that [it] will be effective" (Rossi et al., 2004, p. 135). As a correctional policy, the theoretical underpinnings of SC have not been well articulated (Mears, 2013), and subsequently, there is considerable disagreement in the field as to what types of studies should be conducted, how the results of those studies should be interpreted, and what policy changes should be recommended. Unfortunately, this academic squabbling does little to inform corrections officials on how to best respond to the highly controversial and potentially litigious correctional management practice of SC.

[5] Weaker designs were defined as those studies that did not provide information on its offender characteristics of the control group, or the two groups were not similar on at least five relevant static and dynamic risk factors.

Undeniably, the most effective correctional policies are those based on sound scientific evidence (MacKenzie, 2006), and SC is no exception. However, the research on SC is limited and generally lacking in sound methodology, which makes it difficult to draw clear conclusions regarding what effect these settings may have on inmates' behavior and mental health (Pizarro & Stenius, 2004). Therefore, making informed, "evidence-based" decisions about SC is difficult because the literature is filled with studies that have produced conflicting findings and reached different conclusions (Labrecque & Smith, 2013). As a result, corrections officials must determine which recommendations to follow and which ones to ignore, which in effect grant them carte blanche to do whatever they want. Therefore, there is a need for the creation of a more scientific, evidence-based foundation of SC research that will better guide future policy decisions. However, in order to do so there are a number of issues that must first be addressed.

In a recent policy evaluation essay, Mears (2013) identified five dimensions on which the current SC literature base falls short, including (1) demonstrating a need for SC, (2) articulating a credible theory of SC, (3) determining how SC is implemented in practice, (4) assessing the impact of SC, and (5) determining if the benefits exceed the costs and do so more than other policies. Given these shortcomings, it presently remains difficult—if not impossible—to determine if SC is an effective correctional policy (see also Mears, 2006; 2008; Mears & Reisig, 2006). Thus, in order to develop more informed (i.e., evidence-based) SC policies, there is a need for a stronger foundation of research that addresses these issues (e.g., clearly defines concepts and articulates goals, uses high quality research designs to evaluate outcomes).

Definitional challenges. In order to evaluate the effectiveness of something, that concept must be appropriately defined as to understand what specifically is being tested, and

more importantly to inform what other populations this information can be applied to (external validity). Unfortunately, there is no universally agreed upon definition of SC, or what practices constitute SC (Butler, Griffin et al., 2013). In addressing this basic and fundamental question we first turned to *Black's Law Dictionary* (1968) for some help, which defines SC as:

> [T]he separate confinement of a prisoner, with only occasional access of any other person, and that only at the discretion of the jailer; in a stricter sense, the complete isolation of a prisoner from all human society, and his confinement in a cell so arranged that he has no direct intercourse with or sight of any human being, and no employment or instructions.

This definition was criticized by Thoenig (1972) because it only deals with one aspect of the confinement, social isolation. Thoenig (1972) provided his own definition that he felt takes into account the important factor of sensory deprivation (SD):

> [T]he separate confinement of a prisoner with only occasional, limited access by other persons, to an environment which is stripped of all but the basic necessities for maintaining life and which is generally restrictive of light, sound, diet, reading material, exercise and occasionally of temperature (p. 223).

Neither definition adequately describes the concept of SC used in the U.S. today. It is frequently noted that the physical conditions and routines of SC vary by setting and situation (Mears, 2006; National Institute of Corrections, 1997). This is especially true in the U.S. where the 50 state Department of Corrections (DOCs) and the federal government operates under different guidelines (Butler, Johnson, & Griffin, 2014; Metcalf et al., 2013). A review of the descriptions used in the more recent literature generally describes inmates in SC as being locked in a single cell for 23 hours a day and are allowed out of the cell for only one hour per day for personal hygiene and physical exercise (Butler, Griffin et al., 2013; Metcalf et al., 2013). All inmates in SC are subjected to heightened security procedures (e.g., handcuffed and/or shackled whenever moved outside their cell) and have restricted access to programs (e.g., education, recreation, rehabilitation services). Further, SC inmates eat meals alone in their cells and all personal

communication, even with staff, is kept to a minimum (Fellner, 2000). Although there are different reasons for placing an inmate in SC (e.g., punishment, protective custody, administrative decision), the differences in living arrangements and privileges therein are generally minimal (Kurki & Morris, 2001).

Most recently, criminological research has been particularly focused on one form of SC, the supermax prison (Mears & Castro, 2006; Pizarro et al., 2006). Lost in this literature is the more general effect of SC, which takes many forms within the prison system. Zinger (2013), the Executive Director and General Counsel for the Office of the Correctional Investigator for the Canadian government, describes the different degrees of isolation, which take place in the Canadian correctional system. Zinger (2013) uses the term segregation "lite" to refer to segregation-like units, which operate under near segregation-like conditions. Some SC settings may not meet the definition of SD because inmates may have some access to other inmates (Rhodes, 2005b), a radio, television, books, allow phone calls, and other extra cellular activities, which approximates the sensory input level found from non-SC inmates (see Gendreau & Labrecque, in press).

Purpose of solitary confinement. One reason for the use SC is that states perceive there is a need for the practice in their prison system (Mears, 2006). However, there is no evidence that any state has undertaken a rigorous assessment for determining if any actual need exists, even though such an assessment seems a logical first step before investing in any policy (Mears, 2008). Rossi et al. (2004) emphasize the importance for conducting needs assessments because a program cannot ameliorate a problem if there is no problem to begin with, or if the program does

not actually relate to the problem. Undisputedly, the use of SC has been growing at an alarming rate in the U.S. (King, 1999; O'Keefe, 2008), despite any objective evidence for its need.

The primary purpose reported for the use SC is that they increase systemwide order, safety, and control (National Institute of Corrections, 1997; Pizarro & Stenius, 2004; Mears, 2008). However, many other goals have also been used to justify the practice including improving inmate behavior, decreasing riots, reducing the influence of gangs, preventing prison escapes, punishing inmates, reducing recidivism, rehabilitating inmates, and deterring crime in society (Mears & Castro, 2006). Further, some of these goals inextricably conflict with each other. For example, an inmate may have a greater probability for being rehabilitated if sent to a minimum-security treatment program, but such a placement would also place him/her at a greater risk for escaping custody. Ideally, states should investigate the extent of the problem within their prison system (e.g., disorder, escapes, assaults on staff) first in order to determine if SC is effective in alleviating such problems (Mears, 2008). Without assessing for such a need, there is little rational basis for investing in or maintaining such a costly correctional policy (Lawrence & Mears, 2004).

Toward evidence-based solitary confinement policies. In the latter half of the twentieth century increasing violence led to concerns for maintaining peace and preventing disorder within prisons (Colvin, 1992; Irwin, 1980; Useem & Kimball, 1991; Ward & Werlich, 2003). These events, coupled with a growing public sentiment toward crime that was increasingly punitive (Cullen & Gilbert, 1982; Currie, 1998; Langan, 2005; Garland, 2001) led to an increase in the use of SC to manage offenders, particularly through the use of the supermax (King, 1999; Riveland, 1999a; Sundt et al., 2008).

More recently, state governments have increasingly been forced to emphasize accountability and the need to justify expenditures through reference to evidence-based practices (Campbell, 2003; Preer, 2004; Riveland, 1999a). Not only does SC represent substantial construction and operational costs, but also its effectiveness has largely gone unexamined (Mears & Watson, 2006). Kurki and Morris (2001) commented that "it is surprising and disturbing how little reliable information about supermax prisons is available, considering their proliferation and the moral and policy issues they raise" (p. 386). At the same time prison populations continue to be high, which contributes to a spectrum of managerial challenges, including increased inmate violence, overcrowding, staff turnover, and gang activity (Austin & Irwin, 2012; DiIulio, 1987; Riveland, 1999a). In the face of such concerns and critical challenges, state and federal DOCs can ill afford to maintain correctional polices that are costly or ineffective (Pizarro et al., 2006).

The costs associated with managing offender populations have simply outgrown many state and federal government budgets (Fausset, 2011). As correctional officials search for ways to operate facilities with decreasing tax dollars, SC, which costs considerably more (estimated to be as much as two to three times more expensive) to operate than standard housing options (Johnson & Chappell, 2014; Mears, 2006, National Institute of Corrections, 1997) is one potential target for cost savings (Henningsen et al., 1999). However, SC is also a management tool in which officials have come to rely on for the effective management of prisons (see Mears, 2006; Mears & Castro, 2006), and many would not waiver in the contention that it is needed for the safety and security of prisons (e.g., Angelone, 1999; Gavora, 1996b).

The reports that have often been found in the popular press and other media outlets tend to only promote the idea that SC has detrimental effects (see for example, S. Bauer, 2012; Beth-Pheiffer, 2004; Daly, 2010; Gawande, 2009; Goode, 2012a; Guenther, 2012; Harrington, 1997;

Keim, 2013). Human rights groups (e.g., Human Rights Watch, Solitary Watch) have been also particularly unwavering in their fight to abolish SC (Casella, 2010; Fellner, 2000; Fellner & Mariner, 1997; Taub, 2000). The "evidence" that has typically been used to support their position tends to come from the qualitative studies described above. Further, some have gone to great lengths to discredit any evidence that counters the contention that SC is damaging to inmate well being (Lovell & Toch, 2011; Grassian, 2010; Grassian & Kupers, 2011; Scharff-Smith, 2011). It has been speculated that these psychiatric experts and human rights advocates have gone to such great lengths to respond to such research because they fear that it may undercut their efforts to reform or reduce the use of SC (Fellner, 2011).

Given the media storm of attention and the increasing numbers of civil rights litigation surrounding the practice, some states have responded by developing new SC policies and procedures (Kapoor, 2014; Steinbuch, 2014). As a result of litigation, some correctional systems, including Colorado, Maine, Mississippi, Illinois, Virginia, and Washington have taken steps to drastically reduce their use of SC (American Civil Liberties Union, 2013; Atherton, 2001; Daly, 2010; Goode, 2012b; Kupers et al., 2009; Martin, 2013; The Crime Report, 2011). Further, New York developed an exclusionary law in 2008, which prohibits the use of SC for inmates with certain types of serious mental illnesses (Kates, 2014; The Editorial Board, 2014). It may be too early to tell if these policies will produce their intended effects. However, in the interim, it is vital that that more high quality empirical research is conducted on the effects of this correctional practice.

The bottom line is that the increased cost of SC must be justified somehow (e.g., improves institutional safety, reduces recidivism) because their existence takes away other opportunities (e.g., rehabilitation programs). Ironically, despite its longstanding use and recent

increase in publicity, very little attention has been paid to whether or not the benefits of SC outweigh its costs (social and financial). As such, there is very much a need for a fair and balanced assessment of SC (Mears & Watson, 2006). In the absence of the appropriate empirical evidence, much of this debate is based on extrapolations and generalizations, with many more concerned about influencing policy than with establishing facts. Therefore, *the effectiveness of SC as a correctional policy for reducing institutional misbehavior remains an open empirical question*.

Current study. The rational use of imprisonment requires an understanding of how individuals are affected by the experience (Porporino & Zamble, 1984). There is a growing urgency to gain a better understanding of how prison influences criminal behavior amongst its inhabitants, especially those exposed to the SC setting (Gordon, 2014). There are few studies currently available that have examined the relationship between SC and criminal behavior (refer to Appendix A). In the absence of more empirical evidence, the conclusions that can be drawn regarding the effects of SC are unfortunately limited. Until there is a better empirical understanding of what effect prison, and SC, have on inmate outcomes, our prison system "will remain troubled and confused, impinging on human lives in unpredictable ways" (Porporino & Zamble, 1984, p. 404).

Toward the end of assessing SC from a policy evaluation standpoint, this dissertation seeks to fill a critical gap in the literature by examining the understudied area of the experience SC and its effect on inmate institutional adjustment. Specifically, this study provides a methodologically rigorous test of the effects of SC on subsequent prison misconduct in the state of Ohio, with a focus on how the duration of segregation influences outcome. This study has

both theoretical and practical value and its intention is to provide prison officials with independent, evidence-based knowledge regarding the effects of SC on inmate behavior.

The findings of this study, therefore, have significant implications for criminal justice policy and practice in the U.S. and will assist policy makers and corrections officials in making better, more informed decisions regarding the use of SC. As discussed above, proponents of SC maintain that the practice is vital to a safe and orderly prison and claim that its use causes inhabitants to leave the setting with a reduced probability for engaging in institutional misconduct. However, if SC is unrelated to, or increases misconduct, then the justification for maintaining the use of this practice will be seriously questioned.

The contribution of this work represents one step toward the improvement in the knowledge and understanding of the effects of SC through science. *This dissertation is, therefore, significant because it addresses a real world critical issue facing many prison systems and offers a solution for reducing institutional misconduct through policy changes.* The other potential benefits of this work include the fair and impartial administration of criminal justice in the U.S.

Chapter Three

Method

This study evaluated the effect that SC (*and the length of time spent in SC)* had on subsequent inmate behavior in prison. Recall that most of the research conducted on SC has focused on whether or not the setting produces any iatrogenic physical or mental health effects, and far fewer evaluations have examined the effect of such placement on inmate behavior. Further, many of the available SC evaluation studies have been host to a number of different methodological and statistical shortcomings. These limitations have made it difficult to determine what effect SC has on inmates. Likewise, the purpose of this dissertation is to develop a set of evidence-based SC policy recommendations that can guide policy makers and corrections officials in reducing the inmate misconduct that occurs in prison. To accomplish this objective, this study pursued the following three specific research questions:

> ***Research Question One:*** **Does the experience of SC influence subsequent inmate misconduct in prison?**
>
> ***Research Question Two:*** **Does the length of time spent in SC influence subsequent inmate misconduct in prison?**
>
> ***Research Question Three:*** **Are there offender characteristics (e.g., risk, mental health status, gender, age) that mediate the effects of SC on subsequent inmate misconduct in prison?**

Sample

The data for this dissertation was obtained from the Ohio Department of Rehabilitation and Correction (ODRC) computerized database system. The sampling frame for this study included all inmates who were admitted into ODRC custody between July 1, 2007 and June 30,

2010 (*N* =69,149). Information on this population of inmates was collected until December 31, 2012. Each inmate was treated as one unique case regardless if he or she was admitted multiple times during the observation period. This study further limited its investigation to only those inmates who spent one year or more in custody and also served time in SC (see operational definition below) during this time frame (*N* = 14,311).

Informed Consent Process

The University of Cincinnati's Institutional Review Board (IRB) determined this study to be exempt for review as human subjects' research because it involved secondary data maintained by the ODRC (see Appendix B). Therefore, informed consent was not required.

Data Collection

The ODRC Human Subjects Research Review Committee (HSRRC) approved the application for research proposal (see Appendix C), which granted the author, and his committee, authorization to the ODRC prisoner data used in this dissertation. A Research Specialist from the Bureau of Research and Evaluation was assigned to the project to assist with the collection of necessary information from the ODRCs computerized database system. In order to accomplish the objectives of this dissertation, several variables were collected which are described in detail below.

The dataset used for the purposes of the current study is beneficial for several reasons. First, the Ohio prison system is the fifth largest state system in the U.S., which is comprised of 32 adult correctional institutions[6] that incarcerate approximately 52,000 inmates on any given

[6] At the time of this study, the ODRC operated 30 correctional institutions for adults, and the state contracted with two privately managed facilities.

day (Carson, 2014). Second, the ODRC uses SC throughout its prison system and one of their prisons is a supermax—the Ohio State Penitentiary (OSP)—that is dedicated solely to the practice of SC. Although definitional issues make it difficult to compare state SC rates (see Butler, Griffin et al., 2013), it has been estimated that Ohio houses approximately 6% of its inmates under some form of SC custody (National Institute of Corrections, 1997). According to these estimates, there are more than 3,000 inmates under some form of SC control on any given day in Ohio. Third, the ODRC data included not only demographic and criminal history measures for inmates, but also information about their length of stay in SC, number of placements in SC, reason for placement in SC, and measures of institutional adjustment (i.e., prison misconduct). In short, the size of the ODRC prison population, coupled with its system wide use of SC and advanced computerized inmate management system, made this dataset ideal for the current investigation.

Measures

Repeated measures of custody supervision level, time at risk in prison, institutional misconduct and exposure to SC were constructed into three-month time intervals beginning with each inmate's initial admission date. As Table 1 reveals, the sample size is reduced over time as inmates with shorter sentences are released from custody. The study began with 14,311 inmates, but by the 12th time wave there were only 7,855 inmates still in custody (54.9% of the sample). Since the sample size dropped below 50% in the 13th time wave, the study limited its investigation to just the first three years of the inmates' incarceration (i.e., Wave 1 to Wave 12).

Table 1

Sample Size Per Time Wave

Time Wave	*N*	% of total *N*
T1	14,311	100.0
T2	14,259	99.6
T3	13,900	97.1
T4	13,531	94.5
T5	13,153	91.9
T6	12,595	88.0
T7	11,910	83.2
T8	11,136	77.8
T9	10,131	70.8
T10	9,766	68.2
T11	9,233	64.5
T12	7,855	54.9

Dependent variables. This study investigated the effect that the experience of SC had on inmate adjustment in prison. Prior research suggests that officially detected misconduct is a valid indicator of inmate behavior (e.g., Kroner, Mills, & Morgan, 2007; Simon, 1993; Van Voorhis, 1994). For the purposes of this dissertation, institutional misconduct is defined as a finding of guilt by the ODRC Rules Infraction Board (RIB) for any one of the 61 inmate rules of conduct.[7] Following the work of Steiner (2008) and Steiner and Wooldredge (2013) misconduct is separated into three categories: *violent (e.g., assault), non-violent (e.g., damage to property, theft),* and *drug infractions (e.g., possession of drugs/alcohol).*[8]

Further, these outcome variables are also examined in two forms: *prevalence* and *incidence.* The "prevalence" of misconduct was defined as whether or not the inmate was found guilty of any misconduct, whereas the "incidence" was defined as the frequency of guilty

[7] For a full description of these violations see Appendix D.
[8] For a full description of the specific rule infractions included in each of these categories see Appendix E.

misconduct. Both of the prevalence and incidence measures were examined in order to provide a more comprehensive description of institutional misconduct. That is, some predictors may be more relevant for understanding whether an inmate *ever* engages in misconduct while others may be stronger predictors of the *frequency* of misconduct.

Independent variables. Solitary confinement settings provide tight controls over inmates in order to ensure reductions in violence and other serious disruptions within the prison system (O'Keefe, 2008). The inmates housed in SC throughout the ODRC prison system are subjected to increased cell restrictions and security procedures as well as granted limited access to education, vocation, and recreation services, visitation, and other forms of social interaction. The ODRC has four classifications for SC: Local control, protective control, security control, and disciplinary control.[9] The ODRC database included the entry and exit dates of inmates housed in SC settings, along with the reason for the placement. This information was used to identify which inmates had served time in SC during the sampling time frame.

Local control, or *administrative segregation*, is used for managerial purposes, including responding to an inmate who demonstrates a chronic inability to adjust to the general population, or when an inmates' presence in the general population is believed to be likely to seriously disrupt the orderly operation of the institution. Protective control, or *protective custody*, is used when an inmate needs to be separated from the general inmate population due to personal physical safety concerns. Security control is used for a wide range of reasons, including when needed to facilitate an investigation, pending a hearing before the RIB, pending transfer to another institution, and as a temporary housing assignment for inmates to facilitate an inmate's

[9] For a full description of the official ODRC policies related to each of these practices see Appendix G.

appearance in judicial or administrative proceedings. Finally, disciplinary control, or *disciplinary segregation*, is used as a type of punishment for inmates who engage in institutional misconduct. Inmates may be placed in disciplinary control as determined by the RIB for up to 30 days depending on the nature of the misconduct and their behavior while in segregation.

Given that these four SC classifications seek to serve qualitatively different objectives, (i.e., local control to improve order throughout the system, protective control to reduce the victimization of specific inmates, security control to serve as an interim status, and disciplinary control to reduce inmate subsequent misconduct), this study limited its investigation of SC exclusively to disciplinary segregation. Solitary confinement is further operationalized here in two forms: (1) whether the inmate experienced SC at any time during each time wave (0 = *no*, 1 = *yes*), and (2) the number of days spent in SC during each wave. It should be noted that the SC variables used in all of the analyses in this study have been lagged (e.g., SC measures at time 1 were used to predict misconduct measures at time 2). These variables have been used in this way because inmates had to have been found guilty of misconduct in order to be placed in disciplinary segregation, and if the SC variables were not lagged it would not be possible to parcel out whether the misconduct at a particular time was the cause or the effect of SC in the same wave. It is therefore essential the effects of SC be lagged in order to understand what effect its use has on subsequent behavior.

Control variables. This study drew upon a wide range of control variables based on the extensive amount of literature that has found them to be important predictors of prison misconduct (e.g., Cunningham & Sorensen, 2007; Flanagan, 1983; Gendreau, Goggin, & Law, 1997; Gonçalves, Gonçalves, Martins, & Dirkzwager, 2014; Griffin & Hepburn, 2006; Harer &

Langan, 2001; Harer & Steffensmeier, 1996; Smith, 2006; Smith & Gendreau, 2007; Walters & Crawford, 2013; 2014). Three demographic variables were used in these analyses, which included age at intake (measured in years), race (black and non-black), and gender (male and female). One of the strongest personal predictors of institutional infractions is younger age (Gonçalves et al., 2014). Further, race has also been found to be influential in the prediction of misconduct (Gendreau et al., 1997; Harer & Steffensmeier, 1996; Walters & Crawford, 2013). Although gender has also been found to have a differential effect on institutional behavior (Celinska & Sung, 2014; Harer & Langan, 2001), prior behavioral SC investigations have often failed to include this variable due to insufficient sample sizes. Therefore, the inclusion of a gender variable in this study makes it the largest evaluation of SC on female prisoners to date (n = 778).

This study also included several other theoretically relevant individual-level descriptive characteristic variables. First, serious mental illness was categorized as any *Axis I* or *Axis II* diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) criteria (see American Psychiatric Association, 2013). Major mental illness has been found to be associated with aggressive institutional misconduct (Walters & Crawford, 2014) and inmates suffering from mental health disorders have been shown to be overrepresented in SC units (Haney, 2003).

Another key variable in this study was inmate risk level. Actuarial risk instruments measure an inmate's probability for engaging in recidivism and have been found to produce the highest correlations with such behavior (Gendreau et al., 1997). During the sampling time frame, the ODRC used the Reentry Accountability Plan (RAP) static risk assessment to predict the probability of criminal behavior. The scores of the RAP assessment range from -1 (lowest

risk) to 8 (highest risk). The RAP is further used to separate inmates into two supervision categories: (1) those requiring basic supervision (*low-risk,* scores of -1 to 5), and (2) those in need of intensive supervision (*high-risk,* scores of 6 to 8).

Gang affiliation has also been found to produce an effect on violent misconduct beyond the individual risk factors generally attributed to youth and prior criminal history (Griffin & Hepburn, 2006). Gang affiliation was measured by the ODRC when inmates were identified having a known association with a gang from a security threat group (STG) list. Gang membership was coded as any known past or present STG affiliation (0 = *no*, 1 = *yes*).

This study also included several measures of criminal history. Criminal history has a long-standing and well-documented relationship with offender behavior. Therefore, three criminal history variables were included in this study. First, the most serious offense type for which the inmate was sentenced was included. Following the work of Kopak and Hoffmann (2015), these offenses were categorized into three types: "violent" offenses (e.g., aggravated assault, murder), "nonviolent" offenses (e.g., property-related crimes), and "drug" offenses (e.g., drug possession, driving while intoxicated).[10] Second, inmates who had served prior commitments in the ODRC were defined as having a prior incarceration (0 = *no*, 1 = *yes*). Third, sentence length was defined here as the minimum amount of time for which the offender was sentenced on his or her current offense. Shorter sentences have been found to be predictive of violent institutional misconduct (Cunningham & Sorensen, 2007). Given some inmates in the sample received very long sentences (including lifetime commitments), all sentences greater than 420 months (35 years) were capped at 420 months. Further, because this variable was highly skewed, it was logged.

[10] For a full description of the specific offenses included in each of these categories see Appendix F.

Custodial supervision levels have been correlated with the type and frequency of prison misconduct (Steiner & Wooldredge, 2008b). Even when accounting for prison- and individual-level factors, inmate custody levels are still generally found to be strongly and positively associated with misconduct (Worrall & Morris, 2011). The ODRC classified inmates into five custody levels: *minimum* (1), *medium* (2), *close* (3), *maximum* (4), and *supermax* (5).

As some inmates were released and returned for a variety of reasons during the sampling time frame (e.g., paroled and returned for violation, released out to court and returned from court, released from sentence and returned on a new sentence), this study also controlled for the time at risk in prison during each time wave. This variable was recorded as the number of days spent in prison during each three-month time wave.

Data Analysis

The ideal approach to studying the effects of SC on inmate behavior would be to conduct a randomized controlled experiment in which inmates were randomly assigned to either a SC or non-SC condition. However, this approach clearly is not a realistic possibility given the ethical and moral issues it would raise. Therefore, in order to assess the three research questions described here, this study used a pooled time series panel design. This research design uses the within individual variation in the exposure to SC to assess whether this experience has an influence on being found guilty of subsequent institutional misconduct.

There are two statistical techniques that are often used when analyzing longitudinal panel data: random effects and fixed effects regression modeling (Halaby, 2004; Phillips & Greenburg, 2008). The use of random effects modeling assumes that the effects of the unobserved heterogeneity in individuals are uncorrelated with the observed, explanatory variables, and

therefore, requires the inclusion of stable between-individual differences in the model. In contrast, the use of fixed effects modeling does not make any assumptions regarding the correlation between the unobserved individual effects and the explanatory variables, and as a result, does not require the inclusion of the observed time-stable variables in the analysis.

Allison (2009) has argued the major attraction of the fixed effects method lies in its ability to control for all of the between-individual differences (i.e., each individual is used as his/her own control), thereby eliminating large potential sources of bias. However, the failure to account for both time varying *and* time stable effects on dependent variables is a major drawback of the fixed effects approach (Hsiao, 2014). Some researchers have chosen to use the random effects model due largely for its ability to estimate the effects of time stable covariates. However, it must also be noted that a major limitation of the random effects approach is that if not all of the relevant time stable covariates are included in the model than the method may produce biased results (Phillips & Greenberg, 2008).

There are several considerations in determining which model should be used to analyze a particular dataset, including the results of the comparisons between the estimates of the fixed effects and random effects models (e.g., Hausman test), the quality/type of the data being analyzed, and what questions the researcher is seeking to answer (Halaby, 2004). In order to carry out the analyses in this study, we have opted to use the hybrid random effects model (see Allison, 2005). The hybrid approach represents a middle ground between the fixed effects and random effects models, combining the virtues of both methods (Allison, 2009; Halaby, 2004). The hybrid method decomposes the time varying predictors into within-person and between-person dispersion components, and includes both components in a random effects model (Neuhaus & Kalbfleisch, 1998). The time stable measures in our models represent the average

response for each inmate for that variable across the entire observation period and the time variant components represent the inmates' deviation score for each measure (see Brame, Bushway, & Paternoster, 1999).

The major advantage for analyzing the data in this way is that this method produces coefficient estimates for both time variant and time invariant factors. This is important in this study because we are not just interested in estimating within-individual change (i.e., investigating the effect of SC on misconduct), but also in assessing between-individual change (i.e., understanding how inmate characteristics may mediate the relationship between SC and misconduct). The latter benefit is due to the model's ability to include interaction terms between time variant and time invariant variables, thereby providing the opportunity to assess for potential variation between key relationships (e.g., SC and offender characteristic measures; see Osgood, 2010).

All of the pooled time series model analyses in this study were completed using SAS Version 9.4 using PROC GENMOD (see Allison, 2005). Specifically, the study used hybrid random effects logistic regression to model the prevalence of the misconduct measures (i.e., dichotomous outcomes) and hybrid random effects negative binomial regression to model the incidence of the misconduct measures over time (i.e., discrete counts of outcomes). It is important to note that all pooled time series designs are not without limitations. Although the method is well suited to address the research questions posed here, they are also vulnerable to unobserved time varying covariates that differ between the inmates in SC and the inmates who did not go to SC in a particular time wave. However, this study has attempted to account for the majority of factors related to institutional misconduct in order to reduce any potential bias in its results.

Chapter Four

Results

Table 2 displays the summary statistics of the sample used in the analyses. At the time of admission, the inmates in this study were between 15 and 76 years old, with a mean age of 28.58 (SD = 9.39). There were slightly more black inmates (52%) in the sample. The vast majority of the inmates in the study were male (95%) and most were categorized by the RAP risk assessment to require basic supervision (i.e., low-risk; 91%). Thirty-four percent of the inmates had a mental health diagnosis for an Axis I or Axis II disorder and 30% had past or present ties to a security threat group that was known by the authorities. Half of the inmates in the sample had served prior commitments in the ODRC and the most serious offense for which the inmates were sentenced for on the current commitment were those that were violent in nature (61%), followed by nonviolent (29%) and drug (10%) respectively.

Over the course of the study, inmates were most likely to be found guilty of nonviolent misconduct (21%), followed by violent (10%) and then drug misconduct (4%). These inmates also committed a greater number of nonviolent misconducts (Mean = .45) compared to both violent (Mean = .12) and drug misconducts (Mean = .05) combined. Figures 1 and 2 examine the trend in misconduct over the three-year observation period. Figure 1 reports the prevalence of misconducts and Figure 2 shows the incidence of misconducts per time wave. Three different trends emerge in these figures. First, nonviolent misconduct start at a higher base rate than the other two types, it reaches its highest point in the second wave (3-6 months) and then it begins to slowly decline over time. Violent misconducts have the next highest starting point, but maintain a very slow decline over time. Finally, drug misconducts start with the lowest rate in the first

wave, but jump up slightly and remain at approximately 5% across the entire observation period. It should be noted that the misconduct rates were also examined separated by custody supervision level (not shown) and the trend in both the prevalence and incidence of these measures was similar over time regardless of offender classification rating.

Table 2 also provides the descriptive statistics for the time stable and time variant variables that were included in the pooled time series models. The time stable components represent the inmate's overall status over the twelve time points included in the analyses. For example, the mean score for the custody supervision level was 2.15, with a range of 1.00 to 4.33. This value indicates that the majority of inmates in the study were supervised in medium security custody settings. The time varying components reveal little deviation at the sample level (Mean = .00). However, these variables also show a fairly large range in terms of deviation from their respective time stable scores. For example, the mean deviation score for the number of days in SC was zero, but there is also a range of -42 to 84 on that measure. This indicates that some inmates had a large degree of change on these measures.

Table 2

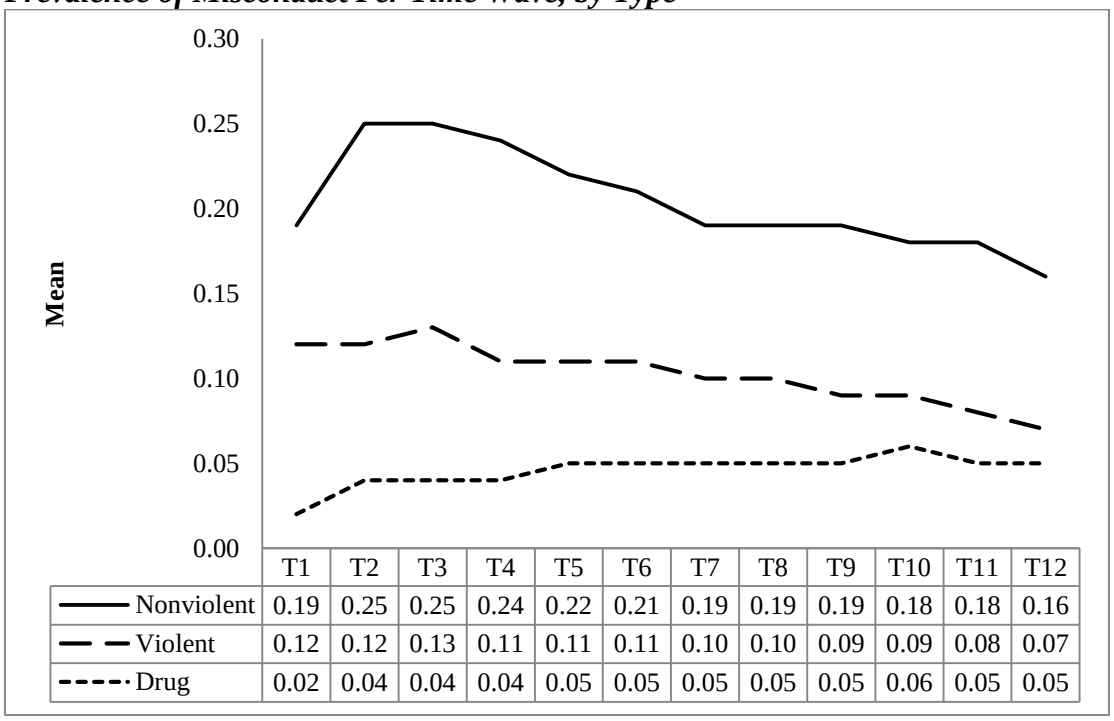
Summary Statistics (N = 14,311)

	%/Mean (SD)	Range
Dependent variables		
Prevalence of violent misconduct	10	–
Prevalence of nonviolent misconduct	21	–
Prevalence of drug misconduct	4	–
Incidence of violent misconduct	0.12 (0.37)	0.00 – 7.00
Incidence of nonviolent misconduct	0.45 (1.15)	0.00 – 56.00
Incidence of drug misconduct	0.05 (0.23)	0.00 – 5.00
Independent variables		
Any SC		
Time variant	0.00 (0.37)	-0.92 – 0.92
Time stable	0.21 (0.16)	0.00 – 1.00
Number of days in SC		
Time variant	0.00 (6.50)	-42.00 – 84.00
Time stable	2.62 (2.97)	0.00 – 42.00
Control variables		
Age at intake	28.58 (9.39)	15.00 – 76.00
Black	52	–
Female	5	–
High-risk[a]	9	–
Serious mental health diagnosis	34	–
Gang	30	–
Most serious instant offense:		
Violent	61	–
Nonviolent	29	–
Drug	10	–
Prior incarceration	50	–
Natural log of sentence length	3.71 (0.85)	1.71 – 6.04
Custody supervision level[b]		
Time variant	0.00 (0.33)	-2.58 – 2.67
Time stable	2.15 (0.69)	1.00 – 4.33
Time at risk in prison		
Time variant	0.00 (12.22)	-82.92 – 50.33
Time stable	87.27 (5.57)	34.00 – 92.01

Note: [a] N =14,215. [b] N = 14,112.

Figure 1

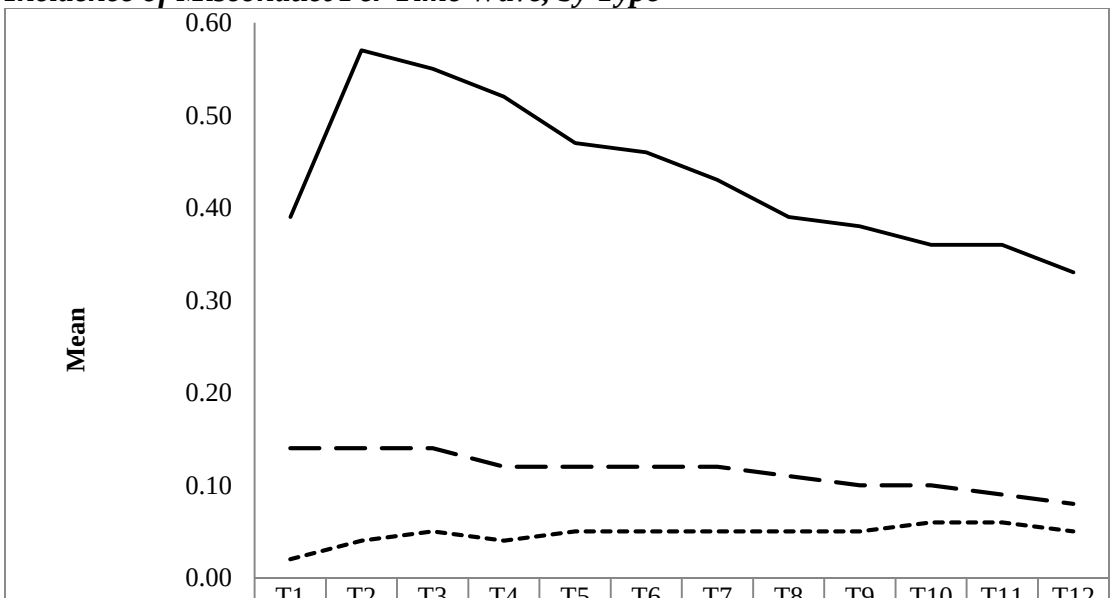
Prevalence of Misconduct Per Time Wave, by Type



	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Nonviolent	0.19	0.25	0.25	0.24	0.22	0.21	0.19	0.19	0.19	0.18	0.18	0.16
Violent	0.12	0.12	0.13	0.11	0.11	0.11	0.10	0.10	0.09	0.09	0.08	0.07
Drug	0.02	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05

Figure 2

Incidence of Misconduct Per Time Wave, by Type

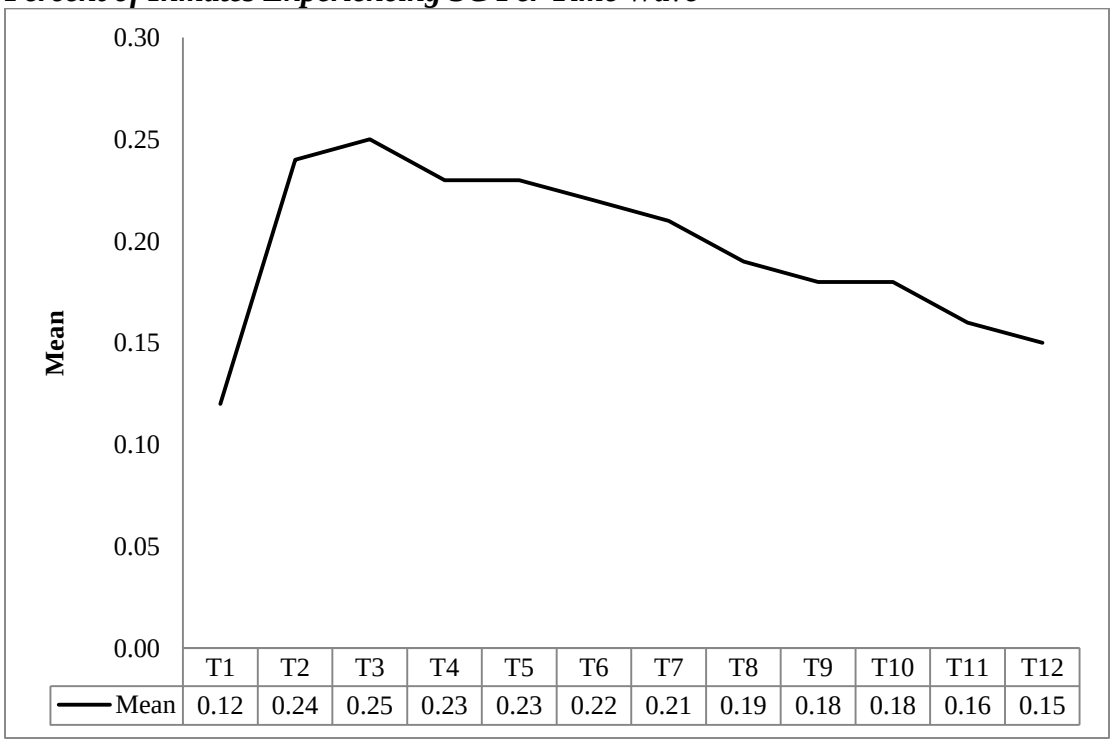


	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Nonviolent	0.39	0.57	0.55	0.52	0.47	0.46	0.43	0.39	0.38	0.36	0.36	0.33
Violent	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.11	0.10	0.10	0.09	0.08
Drug	0.02	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.05

Figures 3 and 4 examine the trend in the use of SC over the three-year observation period. Figure 3 reports the percentage of inmates who experienced SC and Figure 4 shows the number of days spent in SC per time wave. Both figures reveal a similar trend in the use of SC. Solitary confinement is used the least during the first time wave (0-3 months) and there is a very sharp increase in use to the second wave (3-6 months), followed by another increase to its highest point in the third time wave (6-9 months). However, after the third time wave, the use of SC begins to decline slowly over time. Again, the SC measures were examined separately by custody supervision level (not shown) and the trend for the percent of inmates experiencing SC and the number of days spent in SC were similar over time regardless of offender classification rating.

Figure 3

Percent of Inmates Experiencing SC Per Time Wave



	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
Mean	0.12	0.24	0.25	0.23	0.23	0.22	0.21	0.19	0.18	0.18	0.16	0.15

Figure 4

Number of Days Spent in SC Per Time Wave

Finally, the trend in the custodial supervision levels over the three-year observation period indicate the inmates in this study start with a mean classification score of 2.04, which rises slightly over time to its highest point during the twelfth time wave (Mean = 2.44). It should also be understood that because of the attrition due to varying sentence lengths, inmates serving shorter sentences contribute to the average during the earlier waves, but do not during the latter waves. Further, it is important to note that the inmates in this study are almost exclusively rated as minimum (17.1%), medium (48.5%), or close custody (25.1%). This finding suggests that disciplinary segregation may be used more regularly for inmates in less secure settings, perhaps for no other reason than because inmates in higher security settings (i.e., maximum, supermax) are already supervised under more strict "SC-like" conditions.

A correlation matrix for the key study variables is also presented in Tables 3 and 4. Table 3 reports the zero order correlations for any SC and Table 4 shows the zero order correlations for the number of days in SC. In both tables, the intercorrelations for the prevalence of misconduct measures are presented below the diagonal, and the intercorrelations for the incidence of misconduct measures are presented above the diagonal. The bivariate correlations between the SC measures and the misconduct measures produce values ranging from $r = .01$ to $r = .10$. However, two things must be understood about these results. First, although all of these relationships are significant at the $p < .01$ level, these effect sizes are considered "small" by Cohen's (1988) guidelines. Second, these estimates are based on bivariate analyses, which means the impact of other covariates related to misconduct have not been accounted for.

Table 3

Intercorrelations Among Key Study Variables (Any SC)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Any SC (lag)	—	.05*	.10*	.01*	-.06*	.01*	-.01*	.00	.04*	.04*	-.01*	.02*	-.02*	-.01	.11*	-.05*
2. Violent misconduct	.04*	—	.19*	.02*	-.10*	.05*	.01*	-.02*	.03*	.07*	.04*	-.02*	-.03*	-.04*	.07*	.05*
3. Nonviolent misconduct	.10*	.21*	—	.10*	-.10*	.03*	.01*	.00	.07*	.05*	.00	.02*	-.04*	-.03*	.04*	.05*
4. Drug misconduct	.01*	.02*	.11*	—	-.04*	-.04*	-.04*	.01*	.02*	.03*	-.01*	.01*	-.01*	.01*	.04*	.02*
5. Age	-.06*	-.10*	-.10*	-.04*	—	-.11*	.03*	.21*	.14*	-.22*	-.07*	.05*	.04*	.41*	-.18*	.01
6. Black	.01*	.05*	.02*	-.04*	-.11*	—	-.04*	.01*	-.25*	.05*	.17*	-.22*	.05*	.02*	.07*	.01*
7. Female	-.01*	.01*	.01	-.04*	.03*	-.04*	—	-.01*	.20*	-.14*	-.06*	.05*	.03*	-.09*	-.09*	-.01
8. High-risk	.00	-.02*	.00	.01*	.21*	.01*	-.01*	—	.04*	.05*	-.05*	.07*	-.02*	.29*	.05*	-.01*
9. Mentally ill	.04*	.03*	.06*	.02*	.14*	-.25*	.20*	.04*	—	-.05*	.01*	.05*	-.10*	.03*	.05*	.00
10. Gang	.04*	.07*	.06*	.03*	-.22*	.05*	-.14*	.05*	-.05*	—	.05*	-.02*	-.05*	.06*	.21*	.01*
11. Violent sentence	-.01*	.04*	.00	-.01*	-.07*	.17*	-.06*	-.05*	.01*	.05*	—	-.80*	-.42*	-.13*	.30*	.07*
12. Nonviolent sentence	.02*	-.02*	.03*	.01*	.05*	-.22*	.05*	.07*	.05*	-.02*	-.80*	—	-.21*	.10*	-.19*	-.07*
13. Drug sentence	-.02*	-.03*	-.04*	-.01*	.04*	.05*	.03*	-.02*	-.10*	-.05*	-.42*	-.21*	—	.05*	-.22*	-.02*
14. Prior incarceration	-.01	-.04*	-.03*	.02*	.41*	.02*	-.09*	.29*	.03*	.06*	-.13*	.10*	.05*	—	.04*	-.01*
15. Custody level	.11*	.06*	.05*	.04*	-.18*	.07*	-.09*	.05*	.05*	.21*	.30*	-.19*	-.22*	.04*	—	.06*
16. Time at risk	-.05*	.05*	.06*	.02*	.01	.01*	-.01	-.01*	.00	.01*	.07*	-.07*	-.02*	-.01*	.06*	—

Note: Intercorrelations for prevalence of misconduct measures are presented below the diagonal, and intercorrelations for incidence of misconduct measures are presented above the diagonal. * $p < .01$.

Table 4

Intercorrelations Among Key Study Variables (SC days)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SC days (lag)	—	.04*	.09*	.02*	-.05*	-.01*	-.02*	.01	.04*	.04*	-.01*	.03*	-.03*	.00	.12*	-.04*
2. Violent misconduct	.03*	—	.19*	.02*	-.10*	.05*	.01*	-.02*	.03*	.07*	.04*	-.02*	-.03*	-.04*	.07*	.05*
3. Nonviolent misconduct	.09*	.21*	—	.10*	-.09*	.03*	.01*	.00	.07*	.05*	.00	.02*	-.04*	-.03*	.04*	.05*
4. Drug misconduct	.02*	.02*	.11*	—	-.04*	-.04*	-.04*	.01*	.02*	.03*	-.01*	.01*	-.01*	.01*	.04*	.02*
5. Age	-.05*	-.10*	-.10	-.04*	—	-.11*	.03*	.21*	.14*	-.22*	-.07*	.05*	.04*	.41*	-.18*	.01
6. Black	-.01*	.05*	.02*	-.04*	-.11*	—	-.04*	.01*	-.25*	.05*	.17*	-.22*	.05*	.02*	.07*	.01*
7. Female	-.02*	.01*	.01*	-.04*	.03*	-.04*	—	-.01*	.20*	-.14*	-.06*	.05*	.03*	-.09*	-.09*	-.01
8. High-risk	.01	-.02*	.00	.01*	.21*	.01*	-.01*	—	.04*	.05*	-.05*	.07*	-.02*	.29*	.05*	-.01*
9. Mentally ill	.04*	.03*	.06*	.02*	.14*	-.25*	.20*	.04*	—	-.05*	.01*	.05*	-.10*	.03*	.05*	.00
10. Gang	.04*	.07*	.06*	.03*	-.22*	.05*	-.14*	.05*	-.05*	—	.05*	-.02*	-.05*	.06*	.21*	.01*
11. Violent sentence	-.01*	.04*	.00	-.01*	-.07*	.17*	-.06*	-.05*	.01*	.05*	—	-.80*	-.42*	-.13*	.30*	.07*
12. Nonviolent sentence	.03*	-.02*	.03*	.01*	.05*	-.22*	.05*	.07*	.05*	-.02*	-.80*	—	-.21*	.10*	-.19*	-.07*
13. Drug sentence	-.03*	-.03*	-.04*	-.01*	.04*	.05*	.03*	-.02*	-.10*	-.05*	-.42*	-.21*	—	.05*	-.22*	-.02*
14. Prior incarceration	.00	-.04*	-.03*	.02*	.41*	.02*	-.09*	.29*	.03*	.06*	-.13*	.10*	.05*	—	.04*	-.01*
15. Custody level	.12*	.06*	.05*	.04*	-.18*	.07*	-.09*	.05*	.05*	.21*	.30*	-.19*	-.22*	.04*	—	.06*
16. Time at risk	-.04*	.05*	.06*	.02*	.01*	.01*	-.01	-.01*	.00	.01*	.07*	-.07*	-.02*	-.01*	.06**	—

Note: Intercorrelations for prevalence of misconduct measures are presented below the diagonal, and intercorrelations for incidence of misconduct measures are presented above the diagonal. * $p < .01$.

Unconditional Analyses

Before examining the results from the pooled time series regression models, a series of unconditional misconduct rates of the prevalence and incidence for each type of rule infraction were generated and are presented in Figures 5 through 10. Note that two separate misconduct rates are presented in each figure. One trend—the solid line—shows the misconduct rate, by time wave, for inmates who did *not* serve time in SC during the previous time wave. The other trend—the dashed line—shows the misconduct rate, by time wave, for inmates who did serve time in SC during the previous time wave.

These figures indicate that across the three-year period examined here, the raw number of misconducts appears to be higher for the inmates exposed to the SC condition across all time waves with one exception: the inmates exposed to SC during the Wave 1 were less likely to be found guilty of drug misconducts in Wave 2 compared to those who were not exposed to SC in the Wave 1. These figures also suggest that the rate of change for the misconduct measures is similar between the inmates exposed to the SC condition in the previous wave and the inmates not exposed to the SC condition in the previous wave. It should be noted that the sharper decrease found in the violent misconduct measures from T3 to T5 (see Figures 5 and 6) for the SC group is likely due to chance rather than representing a real difference between the two groups. For one, this decrease is followed by a more general decline trend over the remainder of the observation period, and secondly, there is no theoretical rationale for SC to have an especially deterrent effect after an inmate is in custody for 6 to 12 months, which should be followed by a sharp criminogenic effect in the next wave.

Figure 5

Unconditional Mean Prevalence of Violent Misconduct Rates Per Wave, by SC Status

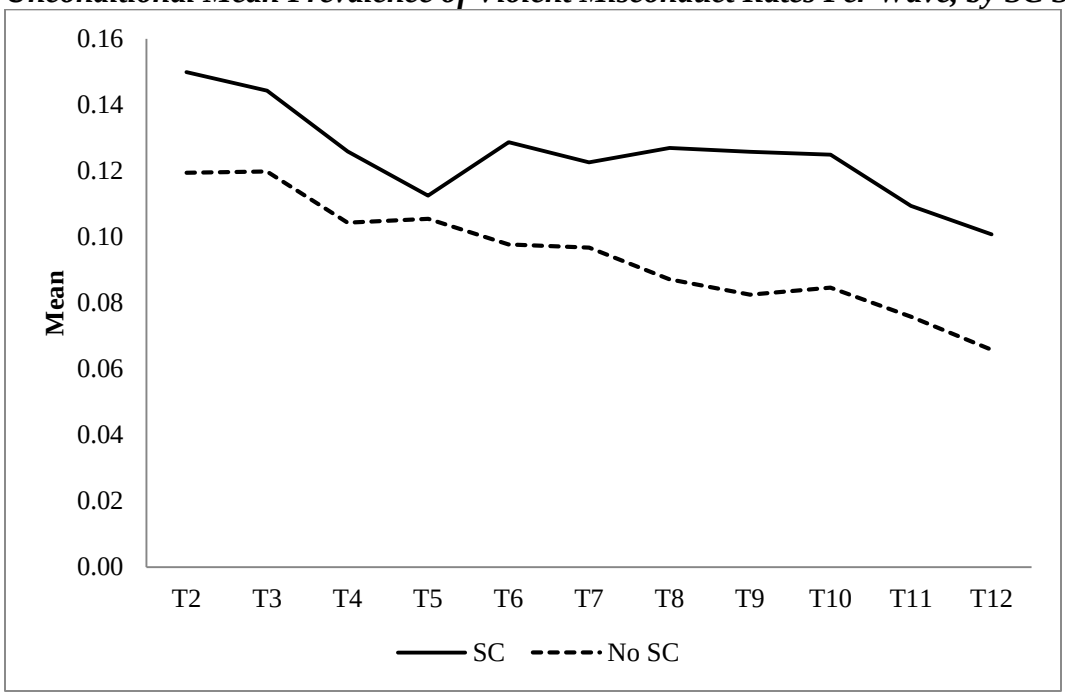


Figure 6

Unconditional Mean Incidence of Violent Misconduct Per Wave, by SC Status

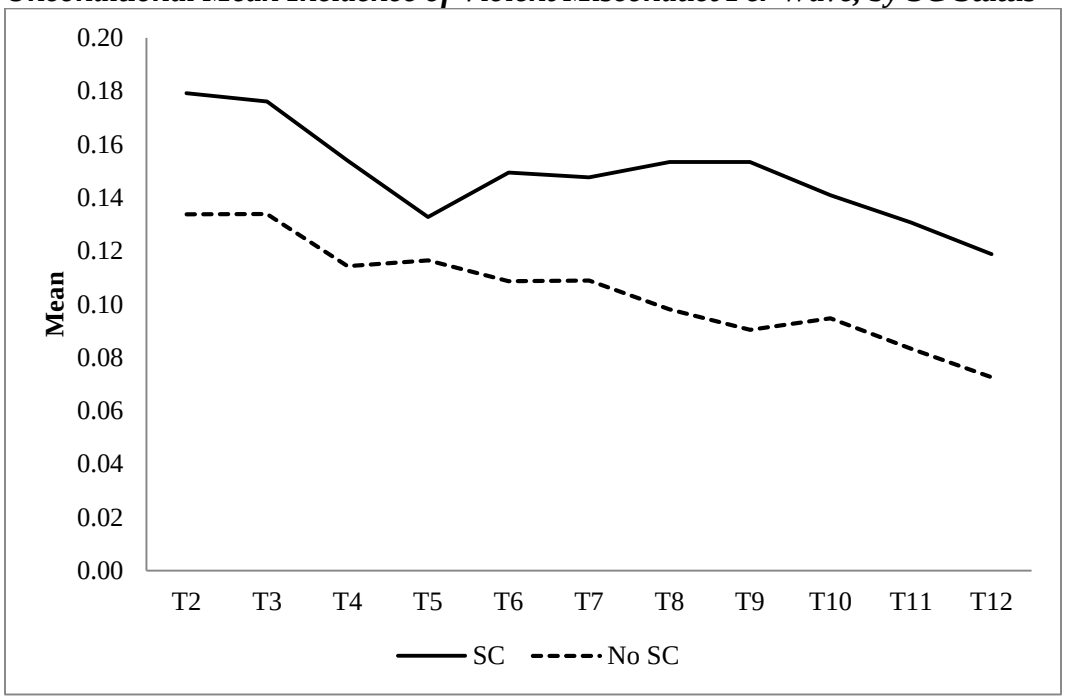


Figure 7

Unconditional Mean Prevalence of Nonviolent Misconduct Rates Per Wave, by SC Status

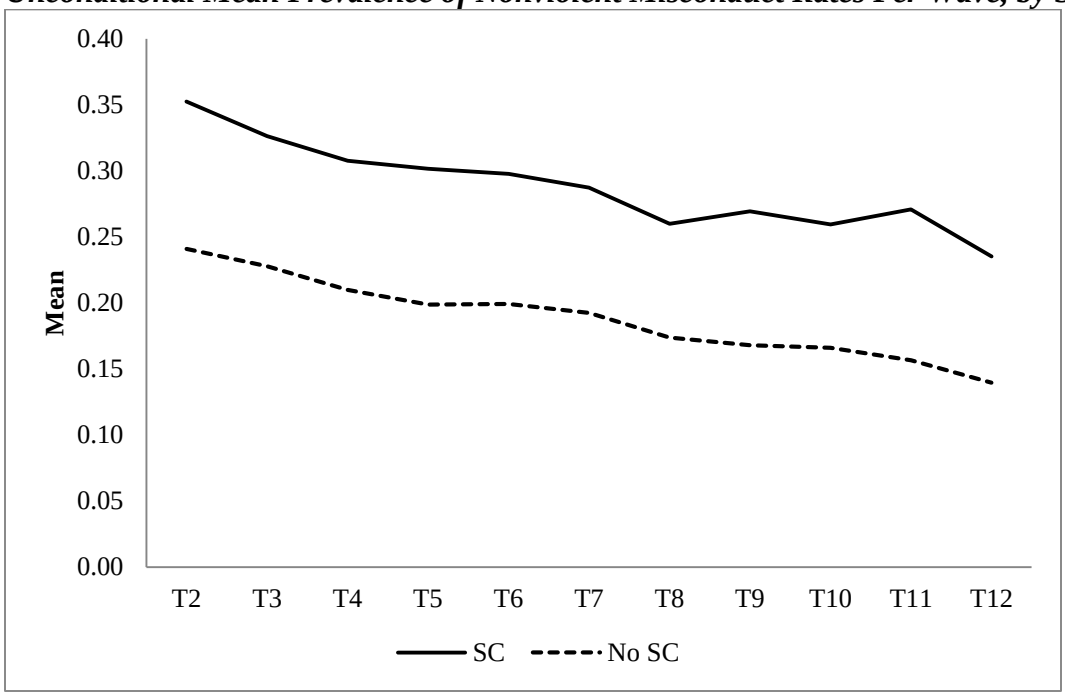


Figure 8

Unconditional Mean Incidence of Nonviolent Misconduct Per Wave, by SC Status

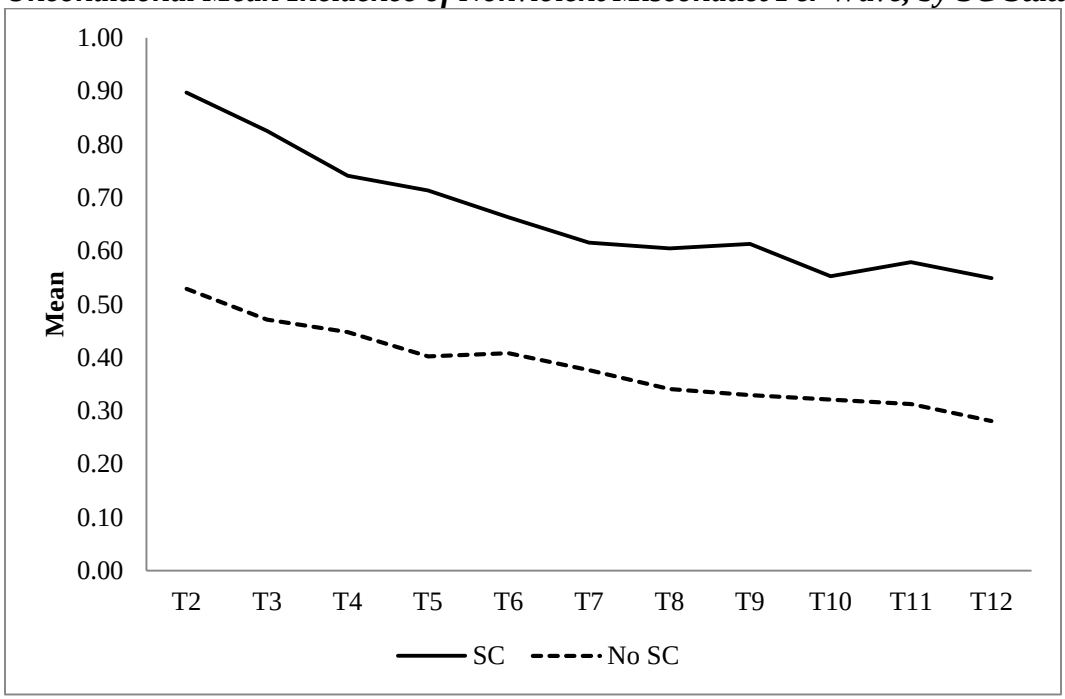


Figure 9

Unconditional Mean Prevalence of Drug Misconduct Per Wave, by SC Status

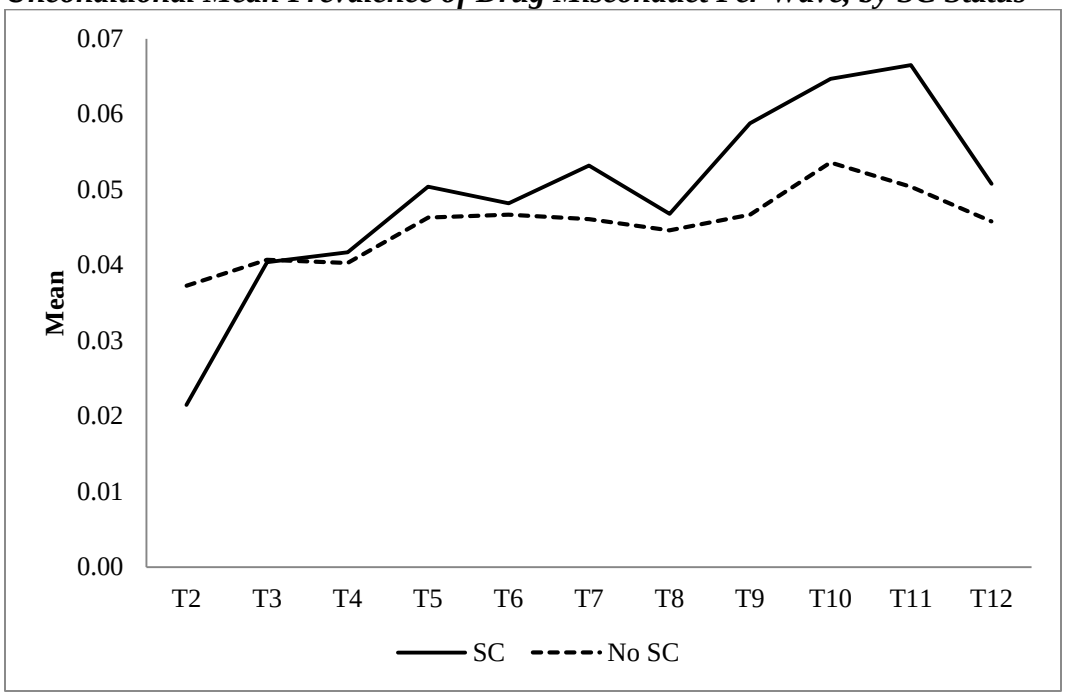
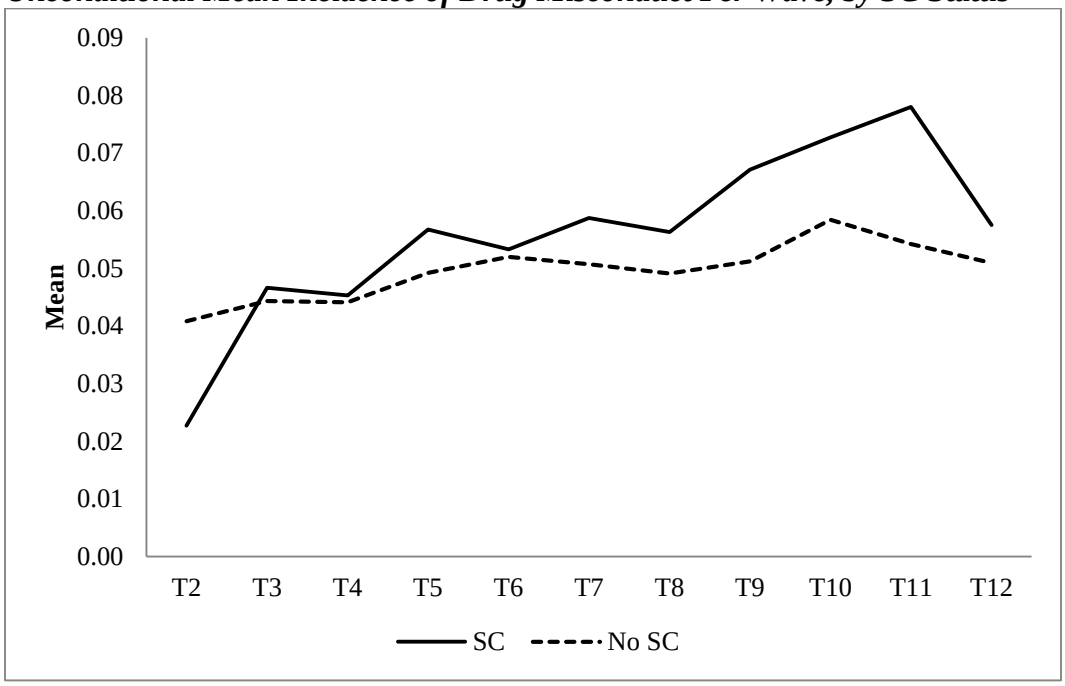


Figure 10

Unconditional Mean Incidence of Drug Misconduct Per Wave, by SC Status



These preliminary results suggest that the experience of SC has no effect on subsequent inmate misconduct. However, it must also be understood that these results are based on unconditional averages, which means the impact of other covariates related to misconduct have not been accounted for in these figures.

Multivariate Analyses

To address the three research questions raised here, this study examined a series of pooled time series analyses. In all of the models examined, the contrast results of the fixed versus random model were significant at the $p < .01$ level.[11] This finding indicates that fixed effects analyses are preferable to random effects analyses (see Allison, 2005). However, this study is interested not only in estimating within-individual change, but also in assessing between-individual change. Therefore, the decision was made to use hybrid random effects logistic regression to model the prevalence of the misconduct measures and hybrid random effects negative binomial regression to model the incidence of the misconduct measures. The hybrid approach is a good choice for the current study because it combines the virtues of both the fixed effects and random effects methods (Allison, 2009; Halaby, 2004). Essentially, the hybrid approach produces coefficient estimates that are similar to the fixed effects method, however it also affords the ability to provide estimates for the time invariant factors and interactions in the model (see Allison, 2005).[12]

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[11] Table 5: violent ($\chi^2 = 212.55$), nonviolent ($\chi^2 = 330.49$), and drug ($\chi^2 = 14.85$).
Table 6: violent ($\chi^2 = 743.31$), nonviolent ($\chi^2 = 789.45$), and drug ($\chi^2 = 54.42$).
Table 7: violent ($\chi^2 = 786.30$), nonviolent ($\chi^2 = 981.67$), and drug ($\chi^2 = 78.01$).
Table 8: violent ($\chi^2 = 884.20$), nonviolent ($\chi^2 = 781.85$), and drug ($\chi^2 = 75.22$).

[12] It should be noted that fixed effects models were also conducted (not shown) and they produced similar results to the hybrid random effects models presented here.

Table 5 presents the logistic regression model results of any SC on the prevalence of misconduct indicators and Table 6 reports the negative binomial results of any SC on the prevalence of misconduct indicators. Table 7 presents the logistic regression model results of the number of days in SC on the prevalence of misconduct indicators and Table 8 reports the negative binomial results of the number of days in SC on the incidence of misconduct indicators. The key results from these analyses are reported in the top row of the four tables, which reveal the effect that SC has on subsequent inmate misconduct, while controlling for the other explanatory variables. Brame et al. (1999) suggest that the time stable variables must be included in the models in order to control for the stability of each measure. Diagnostics were run on the data to check for multicollinearity. For all of the models examined here, multicollinearity does not seem to be a problem. The VIF value for each variable was under 1.6. Belsley (1991) recommends a cut-off value of four, with values greater than four indicating multicollinearity in the data.

As indicated above, Tables 5 and 6 examine the effect that the *experience of SC* has on three types of misconduct, while controlling for the other known predictors of misconduct. In all six of these models, SC was not significantly related to the misconduct outcome measures. *This finding suggests that the experience of SC does not have any effect on the subsequent prevalence or incidence of violent, nonviolent, or drug misconduct in prison.* There are, however, several other especially noteworthy findings in these two models. Specifically, in Table 5 the interactions between SC and female (b = -.232, SE = .116), SC and drug sentence (b = -.382, SE = .121), and SC and age (b = -.011, SE = .004) were significantly related to the prevalence of violent misconduct, the interactions between SC and mental health (b = .210, SE = .040), SC and gang (b = .131, SE = .040), and SC and age (b = -.005, SE = .003) were significantly related to

the prevalence of nonviolent misconduct, and the interaction between SC and mental health (*b* = .215, SE = .077) was significantly related to the prevalence of drug misconduct.

In terms of the magnitude, the exponentiated coefficients suggest that, holding all other variables constant, the experience of SC for female inmates led to a 20.7% decrease in the probability for violent misconduct and for inmates sentenced on a drug offense it led to a 31.8% decrease in the probability for violent misconduct compared to those sentenced on a nonviolent offense. For every one year of age older an inmate was the experience of SC led to a 1.1% decrease in the probability for violent misconduct and a .5% decrease in the probability for nonviolent misconduct. Further, the experience of SC for inmates with a serious mental health diagnosis led to a 23.4% increase in the probability for nonviolent misconduct and a 24% increase in the probability for drug misconduct. Finally, the experience of SC for inmates involved with gangs led to a 14% increase in the probability for nonviolent misconduct.

In Table 6 the interactions between SC and gang (*b* = .093, SE = .045), SC and drug sentence (*b* = -.329, SE = .110), and SC and age (*b* = -.012, SE = .004) were significantly related to the incidence of violent misconduct, the interactions between SC and mental health (*b* = .204, SE = .038), SC and gang (*b* = .116, SE = .038), and SC and drug sentence (*b* = -.184, SE = .076) were significantly related to the incidence of nonviolent misconduct, and the interaction between SC and mental health (*b* = .186, SE = .076) was significantly related to the incidence of drug misconduct.

In terms of the magnitude, the exponentiated coefficients suggest that, holding all other variables constant, the experience of SC for inmates sentenced on a drug offense led to a 28% decrease in the expected count of violent misconduct compared to those sentenced on a nonviolent offense. For every one year of age older an inmate was the experience of SC led to a

1.2% decrease in the expected count of violent misconduct. Further, for inmates involved with gangs the experience of SC led to a 9.7% increase in the expected count of violent misconduct and a 12.3% increase in the expected count of nonviolent misconduct. Finally, the experience of SC for inmates with a serious mental health diagnosis led to a 22.6% increase in the expected count of nonviolent misconduct and a 20.4% increase in the expected count of drug misconduct.

Table 5

The Effect of Solitary Confinement on Prevalence of Misconduct Indicators

	Violent			Nonviolent			Drug		
	B	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**
Time-variant									
Any SC (lagged)	-.115	.142	0.891	-.092	.010	0.912	.124	.198	1.132
Age*SC	-.011**	.004	0.989	-.005*	.003	0.995	-.008	.005	0.992
Black*SC	.102	.053	1.107	-.030	.040	0.970	-.074	.078	0.929
Female*SC	-.232*	.116	0.793	.119	.084	1.126	-.022	.296	0.978
Risk*SC	.024	.099	1.024	.029	.070	1.029	-.152	.138	0.859
Mental health*SC	.100	.053	1.105	.210**	.040	1.234	.215**	.077	1.240
Gang*SC	.084	.051	1.088	.131**	.040	1.140	.016	.077	1.016
Violent offense*SC	.009	.059	1.009	.052	.043	1.053	.036	.084	1.037
Drug offense*SC	-.382**	.121	0.682	-.135	.080	0.874	-.238	.163	0.788
Prior incarceration*SC	.023	.059	1.023	-.007	.043	0.993	-.101	.084	0.904
Custody supervision level	-.401**	.026	0.670	-.490**	.021	0.613	-.124**	.039	0.883
Time at risk	.023**	.001	1.023	.019**	.001	1.019	.012**	.002	1.012
Time-stable									
Any SC (lagged)	1.429**	.234	4.175	2.331**	.187	10.289	1.130**	.326	3.096
Age*SC	.021**	.008	1.021	.052**	.006	1.053	.040**	.011	1.041
Black*SC	.511**	.067	1.667	.235**	.054	1.265	-1.479**	.100	0.228
Female*SC	1.160**	.146	3.190	.406**	.128	1.501	-4.966**	.532	0.007
Risk*SC	-.201	.122	0.818	.097	.096	1.102	.161	.164	1.175
Mental health*SC	.365**	.065	1.441	.637**	.054	1.891	.002	.097	1.002
Gang*SC	.567**	.064	1.763	.113*	.054	1.120	.084	.096	1.088
Violent offense*SC	.504**	.075	1.656	-.187**	.060	0.829	-.089	.107	0.915
Drug*SC	-.129	.156	0.879	-.601**	.117	0.548	.376	.214	1.457
Prior incarceration*SC	-.208**	.075	0.812	-.219**	.061	0.803	.378**	.110	1.459
Custody supervision level	.333**	.017	1.395	.164**	.013	1.178	.216**	.025	1.241
Time at risk	-.007*	.003	0.993	-.003	.002	0.997	.008**	.004	1.008
Controls									
Age	-.028**	.002	0.972	-.026**	.002	0.974	-.028**	.003	0.972
Sentence length (log)	-.162**	.016	0.850	-.175**	.012	0.839	-.028	.023	0.972
Intercept	-1.604**	.216	0.201	-.964**	.161	0.381	-3.752**	.321	
Log Likelihood		-41,034.87			-62,127.52			-23,207.87	
BIC[a]		82,388.30			124,573.59			46,734.29	

Note: ** $p < .01$. * $p < .05$. [a] Smaller-is-better form.

Table 6

The Effect of Solitary Confinement on Incidence of Misconduct Indicators

	Violent			Nonviolent			Drug		
	B	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**
Time-variant									
Any SC (lagged)	-.026	.128	0.974	-.069	.095	0.933	.145	.195	1.156
Age*SC	-.012**	.004	0.988	-.004	.002	0.996	-.008	.005	0.992
Black*SC	.083	.047	1.087	.036	.037	1.037	-.055	.077	0.946
Female*SC	-.197	.102	0.821	.094	.080	1.099	-.098	.298	0.907
Risk*SC	.009	.090	1.009	-.014	.067	0.986	-.167	.137	0.846
Mental health*SC	.077	.046	1.008	.204**	.038	1.226	.186*	.076	1.204
Gang*SC	.093*	.045	1.097	.116**	.038	1.123	.047	.076	1.048
Violent offense*SC	.045	.053	1.046	.017	.041	1.017	.040	.083	1.041
Drug offense*SC	-.329**	.110	0.720	-.184*	.076	0.832	-.289	.161	0.749
Prior incarceration*SC	.040	.052	1.041	-.006	.041	0.994	-.090	.083	0.914
Custody supervision level	-.356**	.023	0.700	-.395**	.019	0.674	-.095*	.038	0.909
Time at risk	.022**	.001	1.022	.017**	.001	1.017	.012**	.002	1.012
Time-stable									
Any SC (lagged)	1.203**	.201	3.330	1.454**	.179	4.280	1.088**	.330	2.968
Age*SC	.029**	.007	1.029	.067**	.006	1.069	.041**	.011	1.041
Black*SC	.382**	.057	1.465	.351**	.053	1.420	-1.479	.099	0.228
Female*SC	.797**	.119	2.219	.574**	.126	1.775	-4.909**	.516	0.007
Risk*SC	-.258*	.102	0.773	-.067	.094	0.935	.197	.167	1.218
Mental health*SC	.290*	.054	1.336	.624**	.053	1.866	.068	.097	1.070
Gang*SC	.425**	.053	1.530	.097	.053	1.102	.066	.096	1.068
Violent conviction*SC	.358**	.064	1.430	-.141*	.059	0.868	-.102	.107	0.903
Drug offense*SC	-.133	.138	0.875	-.554**	.113	0.575	.423*	.215	1.527
Prior incarceration*SC	-.151*	.064	0.860	-.246**	.060	0.782	.335**	.111	1.398
Custody supervision level	.339**	.015	1.404	.191**	.013	1.210	.236**	.025	1.266
Time at risk	-.003	.002	0.997	-.003	.002	0.997	.007	.004	1.007
Controls									
Age	-.030**	.002	0.970	-.029**	.001	0.971	-.028**	.003	0.972
Sentence length (log)	-.159**	.014	0.853	-.205**	.012	0.815	-.040	.023	0.961
Intercept	-1.838**	.196	0.159	-.254	.153	0.776	-3.696**	.319	0.025
Log Likelihood		-45,160.19			-71,365.76			-24,726.12	
BIC[a]		93,455.35			209,937.88			50,654.69	

Note: ** $p < .01$. * $p < .05$. [a] Smaller-is-better form.

Tables 7 and 8 examine the effect that *duration in SC* has on three types of misconduct, while controlling for the other known predictors of misconduct. In all six of these models, time in SC was not significantly related to the misconduct outcome measures. *This finding suggests that number of days spent in SC does not have any effect on the subsequent prevalence or incidence of violent, nonviolent, or drug misconduct in prison.* There are, however, several other especially noteworthy findings in these models. Specifically, in Table 7 the interactions between SC days and gang (*b* = .006, SE = .003) and SC days and age (b = -.001, SE = .000) were significantly related to the prevalence of violent misconduct, the interactions between SC days and mental health (*b* = .008, SE = .002) and SC days and gang (*b* = .007, SE = .002) were significantly related to the prevalence of nonviolent misconduct, and the interaction between SC days and mental health (*b* = .008, SE = .004) was significantly related to the prevalence of drug misconduct.

In terms of the magnitude, the exponentiated coefficients suggest that, holding all other variables constant, each additional day in SC for inmates involved with gangs led to a .06% increase in the expected odds of violent misconduct and a .07% increase in the expected odds for nonviolent misconduct. For every one year of age older an inmate, each additional day in SC led to a .01% decrease in the probability for violent misconduct. Finally, each additional day in SC for inmates with a serious mental health diagnosis led to a .08% increase in probability for nonviolent misconduct and a .08% increase in the odds for drug misconduct.

In Table 8 the interactions between SC days and gang (*b* = .006, SE = .002) and SC days and age (*b* = -.001, SE = .000) were significantly related to the incidence of violent misconduct, and the interactions between SC days and mental health (*b* = .008, SE = .002) and SC days and gang (*b* = .006, SE = .002) were significantly related to the incidence of nonviolent misconduct.

In terms of magnitude, the exponentiated coefficients suggest that, holding all other variables constant, each additional day in SC for inmates involved with gangs led to a .06% increase in the expected count of violent misconduct and a .06% increase in the expected count of nonviolent misconduct. For every one year of age older an inmate, each additional day in SC led to a .01% decrease in the expected count for violent misconduct. Finally, each additional day in SC for inmates with a serious mental health diagnosis led to a .08% increase in the expected count of nonviolent misconduct.

Table 7

The Effect of Duration in Solitary Confinement on Prevalence of Misconduct Indicators

	Violent			Nonviolent			Drug		
	B	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**
Time-variant									
SC days (lagged)	-.001	.008	0.999	-.003	.005	0.997	.006	.010	1.006
Age*SC days	-.001*	.000	0.999	.000	.000	1.000	-.001	.000	0.999
Black*SC days	-.003	.003	0.997	-.002	.002	0.998	-.007	.004	0.993
Female*SC days	-.012	.007	0.988	.006	.005	1.006	.019	.017	1.019
Risk*SC days	.002	.005	1.002	-.006	.004	0.994	.001	.007	1.001
Mental health*SC days	.002	.003	1.002	.008**	.002	1.008	.008*	.004	1.008
Gang*SC days	.006*	.003	1.006	.007**	.002	1.007	.000	.004	1.000
Violent offense*SC days	.001	.003	1.001	.001	.002	1.001	-.001	.004	0.999
Drug offense *SC days	-.011	.007	0.989	-.001	.004	0.999	-.009	.008	0.991
Prior incarceration*SC days	.002	.003	1.002	-.004	.002	0.996	-.005	.004	0.995
Custody supervision level	-.404**	.026	0.668	-.475**	.021	0.622	-.126**	.039	0.882
Time at risk	.023**	.001	1.023	.019**	.001	1.019	.012**	.002	1.012
Time-stable									
SC days (lagged)	.061**	.013	1.063	.090**	.011	1.094	.062**	.017	1.064
Age*SC days	.000	.000	1.000	.002**	.000	1.002	.001	.001	1.001
Black*SC days	.047**	.004	1.048	.038**	.004	1.039	-.071**	.006	0.931
Female*SC days	.093**	.011	1.097	.047**	.010	1.048	-.296**	.041	0.744
Risk*SC days	-.024**	.008	0.976	.003	.006	1.003	.013	.009	1.013
Mental health*SC days	.023**	.004	1.023	.048**	.004	1.049	.001	.006	1.001
Gang*SC days	.034**	.004	1.035	.006	.004	1.006	.000	.006	1.000
Violent offense*SC days	.038**	.005	1.039	-.004	.004	0.996	.003	.006	1.003
Drug offense*SC days	.015	.012	1.015	-.035**	.009	0.966	.054**	.014	1.055
Prior incarceration*SC days	-.014**	.005	0.986	-.013**	.004	0.987	.019**	.007	1.019
Custody supervision level	.415**	.017	1.514	.223**	.013	1.250	.248**	.024	1.281
Time at risk	-.008*	.003	0.992	-.005**	.002	1.002	.005	.004	1.005
Controls									
Age	-.024**	.002	0.976	-.021**	.001	0.979	-.021**	.002	0.979
Sentence length (log)	-.218**	.015	0.804	-.229**	.012	0.795	-.053*	.023	0.948
Intercept	-1.214	.210	0.297	-.383*	.156	0.682	-3.563**	.314	0.028
Log Likelihood		-41,597.04			-63,220.57			-23,315.06	
BIC[a]		83,512.65			126,759.70			46,948.68	

Note: ** $p < .01$. * $p < .05$. [a] Smaller-is-better form.

Table 8

The Effect of Duration in Solitary Confinement on Incidence of Misconduct Indicators

	Violent			Nonviolent			Drug		
	B	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**	***B***	**SE**	**Exp(*b*)**
Time-variant									
SC days (lagged)	-.001	.007	0.999	.002	.006	1.002	.009	.010	1.009
Age*SC days	-.001*	.000	0.999	.000	.000	1.000	-.001	.000	0.999
Black*SC days	-.002	.002	0.998	.001	.002	1.001	-.005	.004	0.995
Female*SC days	-.008	.006	0.992	.006	.006	1.006	.015	.018	1.015
Risk*SC days	.002	.005	1.002	-.006	.004	0.994	.000	.007	1.000
Mental health*SC days	.001	.002	1.001	.008**	.002	1.008	.007	.004	1.007
Gang*SC days	.006**	.002	1.006	.006**	.002	1.006	.002	.004	1.002
Violent offense*SC days	.004	.003	1.004	.000	.002	1.000	-.002	.005	0.998
Drug offense*SC days	-.010	.006	0.990	-.006	.005	0.994	-.015	.009	0.985
Prior incarceration*SC days	.002	.003	1.002	-.001	.002	0.999	-.005	.004	0.995
Custody supervision level	-.364**	.023	0.695	-.387**	.019	0.679	-.099**	.040	0.906
Time at risk	.022**	.001	1.022	.017**	.001	1.017	.012**	.002	1.012
Time-stable									
SC days (lagged)	.061**	.011	1.063	.066**	.011	1.068	.070**	.018	1.072
Age*SC days	.000	.000	1.000	.003**	.000	1.003	.001	.001	1.001
Black*SC days	.037**	.004	1.038	.043**	.004	1.043	-.073**	.006	0.930
Female*SC days	.059**	.008	1.061	.051**	.010	1.052	-.287**	.039	0.751
Risk*SC days	-.026**	.006	1.026	-.012	.006	0.988	.011	.010	1.125
Mental health*SC days	.018**	.004	1.018	.041**	.004	1.042	.002	.006	1.002
Gang*SC days	.024**	.003	1.024	.004	.004	1.004	-.002	.006	0.999
Violent offense*SC days	.027**	.004	1.027	-.004	.004	0.996	.002	.007	1.002
Drug offense*SC days	.013	.010	1.013	-.030**	.004	0.970	.059**	.015	1.061
Prior incarceration*SC days	-.010*	.004	0.990	-.017**	.004	0.983	.019**	.007	1.019
Custody supervision level	.415**	.015	1.514	.218**	.013	1.244	.262**	.024	1.300
Time at risk	-.005	.002	0.995	-.005*	.002	1.004	.005	.004	1.005
Controls									
Age	-.025**	.014	0.975	-.024**	.001	0.976	-.021**	.002	0.979
Sentence length (log)	-.210**	.014	0.811	-.240**	.012	0.787	-.058**	.023	0.944
Intercept	-1.545**	.193	0.213	.091	.152	1.237	-3.533**	.314	0.029
Log Likelihood		-45,696.28			-71,959.20			-24,821.25	
BIC[a]		94,508.34			211,124.76			50,844.94	

Note: ** $p < .01$. * $p < .05$. [a] Smaller-is-better form.

Chapter Five

Discussion

Solitary confinement has been used in U.S. prisons since the inception of the penitentiaries in the early nineteenth century (Foucault, 1995), and for nearly just as long; the merits of this practice have been fiercely debated (see Haney, 1997; and Scharff-Smith, 2006). Unfortunately, despite this long history of use and opposing viewpoints regarding its effects, empirical research on SC has been scant. Although the available empirical studies have generally found SC to have a null to weak negative effect on post-release outcomes (Butler, Steiner et al., 2013; Lovell & Johnson, 2004; Lovell et al., 2007; Mears & Bales, 2009; Motiuk & Blanchette, 2001; Ward & Werlich, 2003), far less attention has been given to examining its effect on institutional measures. The lack of research in this area has left policy makers and corrections officials with limited evidence from which to base their decisions related to the use of SC.

A review of the literature uncovered only two studies that have examined the effects of SC on institutional outcomes. The first was an aggregate-level analysis conducted by Briggs et al. (2003), which found states that implemented supermax prisons had lower levels of inmate-on-inmate and inmate-on-staff assaults than states without supermax prisons. More recently, in an evaluation of SC in state of Texas, Morris (2015) found that SC did not have any significant effect on subsequent violent misconduct in prison. Unfortunately, however, there is not one study available that has examined the effect of SC on misconduct types other than violence. Further, although it has often been suggested that there are certain individuals who are especially vulnerable to the negative effects of SC, through pre-existing personality organization or mental

disorder, or through their individual circumstances (Glancy & Murray, 2006), there are no investigations available that have assessed whether any of these offender-level characteristics had a differential effect on such outcomes.

This dissertation addressed three research questions based on the prior research in an attempt to fill a critical gap in the SC literature. In so doing, this study has made several contributions. First and foremost, this study focused on the understudied area of the effect of SC on institutional adjustment (i.e., behavioral measures). Second, this investigation included an examination of the effects not only of the experience of SC, but also of the number of days spent in SC. Third, this dissertation included institutional measures of violent, nonviolent, *and* drug misconduct outcomes. Fourth, this study employed a pooled time series panel design, a longitudinal data analysis method that has been shown to be particularly useful in making causal inferences from non-experimental data (see Allison, 2009). Finally, the multivariate analyses in this study involved several SC interaction terms, including those for age, race, gender, risk, mental health, gang involvement, offense type, and prior incarceration, which afforded the opportunity to assess whether these individual characteristics mediated the effects of SC on subsequent inmate misconduct.

The analyses described in the previous section provided some new insights into the effect of SC on the prevalence and incidence of three different types of inmate misconduct. In this section, these findings are contextualized and discussed in light of the prior research on the effects of SC and with respect to the research questions posed here. The results of this study are also discussed in terms of their practical and policy implications. Finally, a call is made for continued empirical research in this area in order to better understand what effect SC has on inmate behavior.

Major Findings

The results of this dissertation must be understood with the caveat that the data used for this dissertation came from a pre-existing data source. Therefore, there are several limitations inherent to this secondary type of research design (e.g., data limited to the quality and type of information available from the ODRC). Nonetheless, this study is still very important given the several advancements it makes (e.g., understudied outcome type, large sample size, inclusion of key moderators). Each of the three research questions is now discussed in lieu of the studies findings and limitations.

Research Question One: Does the experience of SC influence subsequent inmate misconduct in prison?

The first research question inquired whether the experience of SC influenced subsequent inmate misconduct in prison. The intercorrelations between the experience of SC and the misconduct variables examined here indicated there was a small positive association among these relationships (values ranging from $r = .01$ to $r = .10$). However, it must also be recognized that these estimates are based on bivariate analyses, and thus the impact of other covariates related to misconduct were not accounted for. The unconditional models comparing the differences in outcome between the inmates exposed to SC in the previous wave and the inmates not exposed to SC in the previous wave showed a similar trend in the rate of change for the misconduct measures over time between the two groups. This finding suggests that the experience of SC had no effect on subsequent inmate misconduct. However, it must also be understood that these results are also based on unconditional averages, which means the other covariates related to misconduct have also not been controlled for in these models. In all six of the multivariate models that examined the effect of the experience of segregation, SC was not

significantly related to misconduct. These results suggest that *the experience of SC does not influence subsequent misconduct in prison.*

Research Question Two: **Does the length of time spent in SC influence subsequent inmate misconduct in prison?**

It has been noted that the effect of the length of stay in SC on prisoner behavioral outcomes has also not been investigated adequately and is an important area for study (Lanes, 2011). Therefore, the second research question examined whether duration in SC influenced subsequent inmate misconduct. According to supporters of SC, longer durations in segregation should reduce misconduct to a greater extent than shorter durations. However, according to critics of SC, longer durations in segregation will exacerbate the detrimental effects of the setting, leading to even more criminal behavior. In this study, the intercorrelations between the length of time in SC and the misconduct variables examined here indicated there was a small positive association among these relationships (values ranging from $r = .02$ to $r = .09$). Again, it must be recognized that these estimates are also based on bivariate analyses, and thus the impact of other covariates related to misconduct have not been accounted for. In all six of the multivariate models that examined the effect duration in segregation, SC was not significantly related to misconduct. These findings indicate *the length of time spent in SC does not influence subsequent inmate misconduct in prison.*

Research Question Three: **Are there offender characteristics (e.g., risk, mental health status, gender, age) that mediate the effects of SC on subsequent inmate misconduct in prison?**

Imprisonment cannot be expected to affect all individuals uniformly (Porporino & Zamble, 1984). Some inmates may do better in SC, even for long durations, whereas others may experience negative outcomes, even in short durations (O'Keefe, 2008). Unfortunately, it is still largely unknown which subgroups of offenders, if any, are more/less adversely effected

by SC. Likewise, the third research question asked whether there were any offender characteristics (e.g., risk, mental health status, gender, age) that mediated the effects of SC. Although this study uncovered several statistically significant interaction effects, it is perhaps surprising that most of these interactions were not significant and the magnitudes of these relationships were not larger, especially given the dearth of literature which maintains certain subgroups of inmates will be more adversely affected by such experiences.

Mental health. One of the major ethical concerns SC raises is that the mentally ill are often overrepresented in these settings. Studies from many different prison systems have indicated there is a higher prevalence of severe mental disorders found among SC inmates compared to in the general prison population (Anderson et al., 2000; Bottos, 2007; Haney, 2003; Hodgins & Côté, 1991, Lovell, 2008; O'Keefe, 2008; Wormith et al., 1988; Zinger et al., 2001). In addition, there have been certain psychiatric diagnoses that have emerged as particularly predictive of placement in SC, including schizophrenia, bipolar disorder, adjustment disorder, and depressive disorder (Anderson et al., 2000; Hodgins & Côté, 1991). It has been suggested that the stress, lack of meaningful social contact, and unstructured days spent in the SC setting are responsible for exacerbating the symptoms of mental illness or for provoking recurrence (Metzner & Fellner, 2010). Further, some researchers have indicated that the adverse effects of SC are especially significant for prisoners with serious preexisting mental illnesses (e.g., schizophrenia, bipolar disorder, major depressive disorder) and that the mentally ill are more likely to suffer the deleterious effects of such placement (Arrigo & Bullock, 2008, Kurki & Morris, 2001; Metzner & Fellner, 2010; Morris, 1982).

This dissertation assessed for the differences in outcomes based on mental health status, with mentally ill inmates being defined as those who had an Axis I or Axis II diagnosis. This study found that mentally ill inmates who experienced SC were more likely to engage in subsequent nonviolent and drug misconduct, but no more likely for violent misconduct. Specifically, the experience of SC for mentally ill inmates led to an approximately 23% increase in the probability for, and expected count of, nonviolent misconduct, and a 24% increase of the probability for, and a 20% increase in the expected count of drug misconduct. Further, each additional day in SC for inmates with a serious mental health diagnosis led to a .08% increase in probability for, and expected count of, nonviolent misconduct, and a .08% increase in the odds for drug misconduct.

The increase in drug misconduct is perhaps not a surprise, as the mental health and substance abuse link is very well established (Fazel, Bains, & Doll, 2006; Karberg & James, 2005). However, the finding that the mentally ill are no more likely to engage in violent misconduct, but are more likely for nonviolent misconduct is interesting. It is conceivable that some mentally ill inmates would prefer the SC setting to the general prison population living arrangement. Although the idea of living in SC may not be appealing to the "average" offender, it is possible that there are several desirable aspects of the setting for inmates with serious mental health disorders, such as more predictability, less stimulation, less social interactions, and fewer requirements (Brown, Cromwell, Filion, Dunn, & Tollefson, 2002). Mentally ill inmates may not only request to be placed in SC settings, but might also engage in behaviors (e.g., rule infractions, acting out) that would result in their being placed in punitive segregation (Gendreau & Labrecque, in press). Future research should focus on further unpacking the effect that SC has on the mentally ill.

Gangs. Prison gangs represent substantial problems for prison officials (Tachiki, 1995). Further, because gang membership is often linked to misbehavior in prison, gang members often find themselves in punitive segregation settings. This study found gang members to be more likely to engage in violent and nonviolent misconduct after being released from SC. Specifically, the experience of SC led to a 14% increase in the probability for nonviolent misconduct, and a 12% increase in the expected count of nonviolent misconduct and a 10% increase in the probability for violent misconduct. Further, each additional day in SC for inmates involved with gangs led to a .06% increase in the expected odds of, and expected count of, violent misconduct and a .07% increase in the expected odds for, and a .06% increase in the expected count of nonviolent misconduct.

Gender. There is very little empirical information available on how female inmates respond to SC. Some researchers have argued that correctional policies, which often fail to consider female histories of trauma, such as SC, fail to recognize that female offenders may become more agitated from the experience and increase their maladaptive behaviors (Dell, Fillmore, & Kilty, 2009). It has also been suggested that ill-adapted correctional policies borrowed from models designed for males, have often failed to produce substantive equality to which female inmates are entitled (Arbour, 1996). Although this study was not fully able to explore all of the gender-based differences in the effects of SC, it was unique in containing a sample of 778 female inmates who experienced punitive segregation during their prison commitment. This sample size is very large in this area, and gave this study the ability to empirically assess for differences in outcome based on inmate gender.

This study found that the experience of SC for female inmates led to a 20.7% decrease in the probability for violent misconduct. It is noteworthy that although the other female and SC interactions in the other violent misconduct models were not significant, the coefficients were all in the same direction, negative, suggesting females were less likely to engage in violent behavior as a result of SC compared to males. However, the findings regarding gender should be interpreted cautiously, as it is unknown what differences exist between the SC settings of males and females (e.g., if males and females were treated differently by security staff based on their gender differences) and anecdotally there is reason to suspect that these differences are important as they may relate to outcome. Future studies should continue to assess for gender differences in the effects of SC and a priority should be given to examining how females in particular are affected by the experience given that there is currently very little evidence available on this topic.

Risk. Another key variable in this study was inmate risk level. Actuarial risk instruments have been found to produce very high correlations with institutional and post-release behavior (Gendreau et al., 1997). Further, prior research has shown that prison misconduct predicts post-release recidivism (Cochran et al., 2014; Gendreau & Goggin, 2013). Given that the general incarceration literature finds that offenders are differentially affected by the experience of prison by risk (i.e., low-risk have an increased probability for recidivism; see Jonson, 2010; Smith, 2006), it is curious that the current study did not find any significant relationship between SC and risk with any of the measures of misconduct. This finding may be a result of the type of risk assessment that was used. During the time of this study, the ODRC used the RAP assessment, an instrument with few items (scores range from -1 to 8) and limited empirical support.

However, in April of 2011, the ODRC stopped using the RAP and began using the Ohio Risk Assessment System-Prison Intake Tool (ORAS-PIT) as its risk assessment instrument for all inmates admitted into the prison system. The ORAS-PIT is a validated offender risk/needs assessment that is comprised of 30 items worth a total of 40 points, which are separated into 5 domains: (1) *criminal history*, (2) *school problems and employment*, (3) *family and social support*, (4) *substance use and mental health*, and (5) *criminal lifestyle*. The total score is then collapsed into different risk categories by gender. The inmates in the current study were all assessed with the RAP and not the ORAS-PIT. Future studies should assess for the differential effects of risk based on other risk instruments (e.g., ORAS-PIT) to see if any significant relationships emerge.

Race. Some researchers have suggested the disproportionate minority presence in SC settings proves the prison system is racist (see Taub, 2000). It is worth noting that although the ODRC admitted approximately 45% black inmates during the years examined (see Bennie, 2008; 2009; 2010), 52% of the SC inmates in this study were black. The reason for the disparity in SC placement by race is beyond the scope of this study. However, this dissertations findings provide no evidence that black inmates are any more likely to engage in subsequent misconduct as a result of SC compared to non-black inmates on any of the outcome measures examined here.

Age. Across all of the models examined age was inversely related to misconduct, which supports the dearth of research that finds younger age as a predictor of institutional misbehavior (see Gonçalves et al., 2014). Further, the interaction between age and SC also revealed that for

inmates who experienced SC, each additional year of age led to a 1.1% decrease in the probability for, and a 1.2% decrease in expected count of violent misconduct, and a .5% decrease in the probability for nonviolent misconduct. For every one year of age older an inmate, each additional day in SC also led to a .01% decrease in the probability for, and expected count of violent misconduct. This finding suggests that younger inmates may be at an increased risk for engaging in violent and nonviolent misconduct after being released from SC.

Offense type. This study also included the most serious offense type for the current commitment (violent, nonviolent, and drug; for a full description see Appendix F). The nonviolent group was used as a reference group. The offense type interaction variables were only significant in two of the 12 models examined. The experience of SC for inmates sentenced on a drug offense led to a 31.8% decrease in the probability for, and a 28% decrease in the expected count of violent misconduct compared to those sentenced on a nonviolent offense. In general, these findings indicate the type of offense an inmate is sentenced for does not mediate the effect of SC on subsequent institutional behavior. However, future research should continue to explore if different offender types are differentially affected by the experience of SC.

Sentence length. In the multivariate models predicting violent and nonviolent misconduct, the natural log of sentence length was found to be strongly and negatively associated. This finding supports Cunningham and Sorensen (2007) in that inmates with shorter sentences were found to be more likely to engage in violent misconduct. These results also indicated that shorter sentences were also more likely to engage in nonviolent misconduct. However, in the drug misconduct models, sentence length was not significant in the experience

of SC models, but was in the duration in SC models. This finding suggests that one way to reduce misconduct in prison is to target for intervention inmates with shorter sentences.

Custody level. This study also controlled for the effect of custody supervision level on the measures of misconduct. In support of the prior research (e.g., Worrall & Morris, 2011; Steiner & Wooldredge, 2008b), the time-stable custody supervision level measures were strongly and positively associated with misconduct. Specifically, there was a 39.5% to 51.4% increase in the probability for, and a 40.4% to 51.4% increase in the expected count of violent misconduct; a 17.8% to 25% increase in the probability for, and a 21% to 24.4% increase in the expected count of nonviolent misconduct; and a 24.1% to 28.1% increase in the probability for, and a 26.6% to 30% increase in the expected count of drug misconduct. However, when the time varying custody supervision level variables were examined, there was a strong and negative effect on misconduct. Specifically, for every one unit increase in custody level there was 33% to 33.2% decrease in the probability for, and a 30% to 30.5% decrease in the expected count of violent misconduct; a 37.8% to 38.7% reduction in the probability for, and a 32.1% to 32.6% reduction in the expected count of nonviolent misconduct; and a 11.7% to 11.8% decrease in the probability for, and a 9.1% to 9.4% reduction in the expected count of drug misconduct.

Summary. The most important finding in this study is the lack of evidence of any effect of SC on subsequent inmate misconduct. In all twelve of the multivariate models examined here, SC was not significantly related to misconduct. *These results suggest that neither the experience of SC, nor the number of days spent in SC, had any effect on the prevalence or incidence of the finding of guilt for subsequent violent, nonviolent, or drug misconduct.* These findings run

counter to the arguments that SC decreases, or increases, criminal behavior and support the conclusion that SC has no effect on criminal behavior.

Further, seriously mentally ill inmates in SC had an increased risk for subsequent nonviolent and drug misconduct, while gang members in SC had an increased risk for subsequent violent and nonviolent misconduct. This study did not reveal much of a difference in effect based on gender, though there is some evidence that females in SC may be less likely than males to engage in subsequent violent misconduct. Risk was not found to have any significant relationship. However, it is cautioned that the risk assessment used was less than ideal and further research should be conducted with other risk instruments before any definitive conclusion are made about the mediating effect of risk on institutional behavior. There were no differences found in the effect of SC based on race or prior incarceration. Younger inmates in SC were found to be at a increased risk for violent and nonviolent misconduct. Finally, sentence offense type did not have much of an influence on misconduct, though being committed for a drug offense showed a reduced risk in violent misconduct when compared to nonviolent offense.

It is important to consider that these findings may not be applicable to all SC settings and inmates. First, the analyses described here were specific to an adult sample of inmates drawn from the Ohio prison system and therefore these results may not necessarily generalize to juveniles or other prison systems. Second, this study excluded inmates who served less than one year in prison and only investigated the effects of SC for three years, so the findings may not generalize to inmates who serve less than one year in prison, or to the period of confinement greater than three years for those inmates who remain in prison for so long. Finally, and this is a very important point, this study focused its investigation exclusively to those inmates who were placed in SC for disciplinary segregation at some point during their commitment. It is fully

acknowledged that inmates housed in SC for other administrative segregation purposes often remain in the setting for much greater durations of time, making these groups qualitatively different. Therefore the findings of this dissertation are more applicable to short-term stays rather than long-term stays, and the findings should not be generalized to inmates spending very long durations under SC conditions or those who are sent to SC for other reasons (e.g., protective custody, awaiting trial).

Limitations notwithstanding, this study is unique in the fact that it involved a large sample (N = 14,311) of inmates from population of inmates from a large state prison system, longitudinal data, appropriate control measures, and three measures of inmate institutional behavior. This study therefore fills a very important gap in the SC empirical literature given the very few studies published to date. The theoretical and practical implications of these findings will now be discussed.

Theoretical Implications

There are three perspectives in the general prison life literature that offer insight as to how SC may influence inmate institutional misconduct (Gendreau & Goggin, 2013; Gendreau & Smith, 2012). The findings from this study are now discussed in terms of these theoretical perspectives.

Prison as punishment. First, the "prison as punishment" perspective, or deterrence theory, maintains that SC suppresses criminal behavior, both in prison and upon release (Angelone, 1999; Gavora, 1996a; 1996b). The results from this study, however, do not provide any support for the prison as punishment perspective. It should also be noted that the

psychological perspective on punishment is quite different from that of criminology. First, the psychological perspective is focused on individual target behaviors. Further, the utility of punishment in the field of psychology as a mechanism for behavioral change suggests there are a number of conditions (e.g., escape from the punishing stimuli is not possible, punishment is administered immediately with maximum intensity at every occurrence of the target behavior) that must be met in order to reliably suppress the unwanted behavior (see Masters, Burish, Hollon, & Rimm, 1987; Matson & DiLorenzo, 1984). In contrast, the deterrence model put forth in criminology reflects a simple cost-benefit equation (see Listwan et al., 2013). Others maintain that the rational choice model is grossly oversimplified in assuming attitudes are perfectly correlated with behavior (Gendreau & Goggin, 2013). According to this perspective, the rational choice position does not acknowledge some commonplace offender characteristics (e.g., concrete thinking, egocentricity, impulsivity, psychopathy) that are incompatible with sound decision making, which in all likelihood, decrease the effectiveness of punishment for offenders who possess these characteristics.

It remains possible that if SC were to follow the 14 principles of effective punishment (for a review see Matson & DiLorenzo, 1984, p. 3) then a different result might occur on criminal behavior. This change, however, would require a major overhaul of how prisons respond to problematic behavior (e.g., escape from the SC should be impossible, SC should be intense, SC should be delivered at every occurrence of the targeted behavior, SC should be administered immediately after the response). Of course, more research in this area should be conducted before any systematic changes are attempted.

Prison as a "school of crime". Second, the prison as a "school of crime" perspective, or deprivation theory, insists SC not only causes serious health problems, but also leads to increased antisocial thinking and criminal behavior (Kupers, 2008; Haney, 2012b). This study casts some serious doubts on the notion that SC is an incubator for crime, whereby its inhabitants are universally released with a far greater propensity for criminal behavior. Although the bivariate results showed a slight positive correlation, these analyses did not control for other known correlates of criminal behavior. It is very well known that inmates in punitive segregation are not representative of the general population, mainly because a requirement for admission is committing an initial institutional misconduct (Pizarro & Narag, 2008). Therefore, there is an intrinsic need for studies to control for these factors when examining the effect of SC in order not to bias their results.

When these correlates were included in the multivariate models, there was no evidence that SC increased the occurrence or count of subsequent institutional misconduct in the total sample. Further, there was no evidence that inmates who experienced SC for longer durations were any more likely to engage in subsequent misconduct compared to those who experienced shorter durations. It must be acknowledged, however, that the inmates in this study served relatively short durations in punitive segregation, particularly when compared to inmates who have served many months to years in SC settings (R. Bauer, 2012; Haney, 2003; Mears & Bales, 2010; Naday et al., 2008). It therefore remains possible that segregation may produce increases in criminal behavior among inmates who serve much longer durations in SC. Again, this is a critical topic for future empirical inquiry.

It is important to note this study also found some evidence that the effects of SC were moderated by certain inmate characteristics. Most notably, mentally ill inmates were more

adversely affected by the experience, causing a notable increase in nonviolent and drug misconduct. Further, inmates involved with gangs had an increase in violent and nonviolent misconduct. More research should be conducted in order to better understand why these two subgroups of offenders are differentially affected by the experience of SC, as well as to explore if there are other moderators not uncovered in the current analyses which influence outcome.

Prison as a "behavioral deep freeze". Finally, the prison as a "behavioral deep freeze" perspective, or importation theory, contends that the characteristics an inmate possesses before prison largely determine how he or she will behave while in custody (Thomas, 1977; Thomas & Foster, 1973; Zamble & Porporino, 1988; 1990). In effect this theory predicts SC will have little, to no, effect on criminal behavior (Gendreau & Goggin, 2013; Gendreau & Labrecque, in press). The findings of this study do lend support to the behavioral deep freeze perspective; namely, that SC has a null effect on institutional behavior. It must, however, also be acknowledged that this study did not include measures of key situational variables, such as how inmates were treated by staff, the climate of the institution, or the conditions of confinement, which are potentially on par as predictors of prison adjustment (Andrews & Bonta, 2010; Gendreau et al., 1997; Gendreau et al., 2006; Gendreau & Labrecque, in press). These variables have an obvious relevance for understanding the effect of SC and it would be beneficial if researchers were better able to measure and assess how these variables may influence such effects.

Policy Implications

Although it has been widely debated what role SC plays in influencing inmate behavior in prison, until recently there have been very few empirical examinations available from which

policy makers could refer to make informed evidence-based decisions regarding the administration of the practice. This dissertation sought to add to this gap in the research literature by examining what effect punitive segregation had on a number of institutional misconduct measures on a sample of inmates in the state of Ohio. It was reasoned here that if the purpose of SC is to improve inmate behavior, than this correctional practice should be evaluated to determine if it is effective in achieving this goal or not. The results of this study revealed that neither the experience of SC, nor the number of days spent in SC, had any effect on the prevalence or incidence of the finding of guilt for subsequent violent, nonviolent, or drug misconduct. *These findings question the logic of relying on SC as a strategy to reduce inmate misconduct in prison.*

The use of segregation may be appealing to some correctional authorities because of its simplicity, but as the findings from this dissertation suggest, SC does *not* appear to be an effective strategy for reducing inmate misconduct. Further, disciplinary segregation is only theoretically capable of influencing inmate behavior, as a specific deterrent, *after* an initial infraction has been committed. So, if SC does not improve behavior, and it costs considerably more than standard housing (Lawrence & Mears, 2004), it is perhaps time for policy makers to seriously consider other alternative strategies for dealing with such rule violators. This raises the question of whether there are other options available that could both ensure institutional safety *and* improve inmate outcomes (Farrell & Dares, 1996).

One such alternative that has been shown to improve offender behavior in institutional and community settings is referred to as the principles of effective intervention (see Andrews & Bonta, 2010; Andrews et al., 1990; Gendreau, 1996; Smith & Schweitzer, 2012). Elsewhere, these principles have been described as the "predominant paradigm for offender rehabilitation"

(Vose, Lowenkamp, Smith, & Cullen, 2009, p. 459). The PEI maintains three main principles: risk, need, and responsivity (RNR). To summarize the RNR model, the risk principle indicates *who* should be treated (higher risk offenders), the need principle indicates *what* should be treated (criminogenic needs), and the responsivity principle determines *how* treatment strategies should be employed (match strategies to the learning styles and motivation of offenders). The research on the PEI has been replicated with remarkable consistency and has been found applicable to a variety of correctional populations (Andrews & Bonta, 2010; McGuire, 2013; Smith, Gendreau, & Swartz, 2009). To illustrate this point, in their meta-analysis of 33 studies, Gendreau and Keyes (2001) found that "appropriate" programs (i.e., those that targeted criminogenic needs or any management style that manipulated variables known to predict prison misconducts) reduced prison misconduct by approximately 17%. Any correctional administrator interested in improving institutional safety would certainly welcome such a sizable reduction in misconduct.

Despite the fact there is little reason to believe SC can effectively reduce institutional misconduct, it is also quite unlikely that this practice will disappear from the correctional landscape anytime soon (Lippke, 2004). Solitary confinement proponents firmly believe the practice helps correctional officials increase institutional safety (e.g., Angelone, 1999; Gavora, 1996a; Stubblefield, 2002), and although other alternative options for reducing criminal behavior may ultimately be more effective in achieving such goals (e.g., rehabilitation programs), these strategies are not always practical or immediately available. Nonetheless, policy makers and corrections administrators have a wide range of discretion in designing and implementing strategies to control problematic behavior in prison including if, when, and for whom, SC should be used (Luise, 1989; Haney, 2009). Further, it must be recognized that inmates who are sent to SC for disciplinary reasons are probably the most likely in need of intervention in order to

stabilize their behavior and increase their ability to function in the general population. This is also consistent with the goals of managing prisons in a safer and more humane fashion.

Policy makers have often justified SC, at least in part, on the premise that the public demands its use (Mears & Watson, 2006; Pizarro et al., 2006; Riveland, 1999b). However, there is little evidence that officials have correctly gauged public opinion about SC (King, 1999; Kurki & Morris, 2001; Mears & Watson, 2006; Pizarro et al., 2006; Riveland, 1999b). Public support for the use of SC is strong when there is a safety benefit anticipated, however, such support diminishes greatly when no such benefit is expected (Mears, Mancini, Beaver, & Gertz, 2013). Further, support wanes when survey respondents were made aware of the costs associated with such practices (Mears et al., 2013). Therefore, policy makers should do more than refer to public support as a means to justify the continued use of SC.

It is very important that the main finding of this dissertation—SC has a null effect on inmate misconduct—should *not* be interpreted as a justification for its continued use at the current levels. Solitary confinement is a lazy way of doing corrections that reinforces short-term thinking and primitive solutions when there are administrative policies, clinical prediction protocols, and treatment programs that can limit its use while maintaining institutional safety and promoting improved behavior (Gendreau, 2012; Gendreau & Labrecque, in press). In closing, SC should be limited to exceptional cases and used only as a last resort. Further, inmates should only be placed in SC for the shortest amount of time possible.

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Appendix A

Summary of Solitary Confinement Empirical Studies of Behavioral Outcomes by Type

Study	Sample	Research Design	Dependent Variable	Effect Size (*r*)
Post-Release Recidivism				
Butler, Steiner et al. (2013)	Ohio Supermax ($n = 52$) Ohio Non-supermax ($n = 52$)	Propensity score matched comparison group	Rearrest	.10
			Felony Rearrest	.14
Lovell & Johnson (2004)	Washington Supermax ($n = 242$) Washington Non-supermax ($n = 242$)	Matched comparison group	Felony Conviction	.07
			Person Offense Conviction	.13
Lovell et al. (2007)	Washington Supermax ($n = 181$) Washington Non-supermax ($n = 181$)	Matched comparison group	Felony Conviction	.07
Mears & Bales (2009)	Florida Supermax ($n = 1{,}241$) Florida Non-supermax ($n = 1{,}241$)	Propensity score matched comparison group	Felony Conviction	.01
			Violent Felony Conviction	.05
			Property Felony Conviction	.01
			Drug Felony Conviction	-.01
			Other Felony Conviction	-.01
Motiuk & Blanchette (2001)	CSC Segregated ($n = 797$) CSC Non-segregated ($n = 801$)	Nonequivalent comparison group	Readmission (any)	.10
			Readmission (new offense)	.19

Ward & Werlich (2003)/ Ward (2009)	Alcatraz Inmates (n = 1,550) Leavenworth Inmates (n = 257)	Nonequivalent comparison group	Felony Conviction	.09
Institutional Misconduct				
Briggs et al. (2003)	Supermax States (Arizona, Colorado, Idaho, Illinois, Michigan, Minnesota, Nebraska, Ohio, Washington) Comparison States (Kentucky, Missouri, Montana, Tennessee, Utah)	Correlational (aggregate-level)	Inmate Assaults	-.14
			Staff Assaults	-.01
Morris (2015)	Texas Supermax (n = 915) Texas Non-supermax (n = 915)	Propensity score matched comparison group	Violent institutional infraction	.01

Note: An effect size with a positive valence indicates an iatrogenic effect (i.e., SC correlates with an increase in the dependent variable), whereas an effect size with a negative valence indicates a positive effect (i.e., SC correlates with a decrease in the dependent variable).

Appendix B

University of Cincinnati IRB Approval

UNIVERSITY OF Cincinnati

Determining Whether a Proposed Activity is Human Research According to DHHS or FDA Regulatory Definitions

Investigators: Please complete the top text boxes. Submit the form to the IRB office at ML 0567, 300 University Hall, or as an email attachment to justin.osborne@uc.edu. You will be notified in writing of the IRB's determination.

Person Requesting Determination and Contact Information	Name & Degree **Paula Smith, Ph.D.**	Department **Criminal Justice**
	Phone **513-556-2775**	Mail Location or Mailing Address **0389**
	Email **paula.smith@uc.edu**	
Title of Project	**The Impact of Solitary Confinement on Subsequent Inmate Institutional Behavior**	
Description of Project, Including Whether or Not Findings Will Be Generalizable	This study will examine secondary data provided by the Ohio Department of Rehabilitation and Corrections. Key variables include, solitary confinement (yes or no), length of solitary confinement, as well as other offender demographics (e.g., gender, race, age), risk level, criminal history, and special population status (e.g., sex offense, mental health conditions). The dependent variable of the study will be institutional misconducts. This study does have the potential of being generalizable to other prison settings.	

Research for which DHHS regulations or UC Policies may apply

BOTH "Research" and "Human participants" categories OR "FDA" (next page) must be true for IRB review to be required.

☐ The activity involves **RESEARCH** because BOTH of the following are true.
- ☐ The activity is a systematic investigation, including a systematic collection of data.
- ☐ The activity is designed to develop or contribute to generalizable knowledge.

☐ The activity involves intervention or interaction with **HUMAN PARTICIPANTS** because BOTH of the following are true.

☐ Human participants are involved because EITHER of the following is true.
- ☐ The data being collected are about living individuals.
- ☐ The data being collected include genetic material (sputum, tissue, swab, blood, body fluids, etc.).

☐ Intervention or interaction is involved because EITHER of the following is true.

☐ The investigator plans to obtain the data through ANY of the following (select all that apply).
- ☐ Physical procedures performed on or by participants.
- ☐ Manipulation of participants.
- ☐ Manipulation of participants' environment.
- ☐ Communication with participants.
- ☐ Interpersonal contact with participants.

☐ The information collected is BOTH of the following.

☐ Private, because EITHER of the following is true.
- ☐ The information is about behavior that occurs in a context in which the individual can reasonably expect that no observation or recording is taking place (such as in a home or a private office).
- ☐ The information is provided by the individual for a specific purpose which the individual can reasonably expect will not be made public (such as class assignments or medical records).

☐ Individually identifiable, because EITHER of the following is true.
- ☐ The identity of the individual is or may readily be ascertained by the investigator.
- ☐ The identity of the individual is or may readily be associated with the information (including a master list linking identity and study ID#).

Please confirm that no identifiable data will be accessed.

-response attached in email. 7-31-12 JO

7/30/12

Research for which FDA regulations or UC policies may apply.

AT LEAST ONE of the following three categories must be true for IRB review to be required.

☐ The activity involves the use of an investigational **DRUG** because ALL of the following are true

- ☐ At least ONE of the following is true (select all that apply).
  - ☐ The article is recognized in the official United States Pharmacopoeia, official Homeopathic Pharmacopoeia of the United States, or official National Formulary, or any supplement to them.
  - ☐ The article is intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or other animals.
  - ☐ The article (other than food) is intended to affect the structure or any function of the body of humans or other animals.
  - ☐ The article is intended for use as a component of any article specified in the above items.
- ☐ EITHER of the following is true.
  - ☐ The article is NOT approved by the FDA for marketing.
  - ☐ The article is NOT being used in the course of medical practice.
- ☐ The article or activity will be used on one or more humans.

☐ The activity involves the use of an investigational **MEDICAL DEVICE** because ALL of the following are true.

- ☐ At least ONE of the following is true (select all that apply).
  - ☐ the article is recognized in the official United States Pharmacopoeia, or official National Formulary, or any supplement to them.
  - ☐ The article is intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or other animals.
  - ☐ ALL of the following are true.
    - ☐ The article is intended to affect the structure or any function of the body of humans or other animals.
    - ☐ The article does NOT achieve any of its primary intended purposes through chemical action within or on the body of humans or other animals.
    - ☐ The article is NOT dependent upon being metabolized for the achievement of any of its primary intended purposes.
- ☐ EITHER of the following is true.
  - ☐ The article is NOT approved by the FDA for marketing.
  - ☐ The article is NOT being used in the course of medical practice.
- ☐ The article or activity will be used on one or more humans.

☐ The activity is **OTHERWISE** subject to FDA regulation because AT LEAST ONE of the following is true.

- ☐ Data from the activity will be submitted to or be held for inspection by the FDA.
- ☐ The activity involves at least ONE of the following FDA regulated articles (select all that apply).
  - ☐ Food or dietary supplement that bears a nutrient content or a health claim.
  - ☐ Food or color additive for human consumption.
  - ☐ Infant formula.
  - ☐ Biological product for human use.
  - ☐ Electronic product for human use.
  - ☐ Other article subject to the Food, Drug & Cosmetic Act.
- ☐ The activity is being done to determine the safety or effectiveness of the drug or device.

For IRB Office Use Only

Determined to be human research requiring IRB review, submission to the IRB is required. ☐

Determined NOT to be human research requiring IRB review, submission to the IRB is NOT required. ☒

Signature of IRB Chair or Designee

8/7/12
Date

Osborne, Justin (osbornji)

From: Smith, Paula (smithp8)
Sent: Tuesday, July 31, 2012 9:39 AM
To: Osborne, Justin (osbornji)
Subject: Re: Determining human subject research

Thanks, Justin. I can confirm that no identifiable data will be accessed for the purposes of this project. Please don't hesitate to let me know if you have any additional questions.

Best regards,

Paula

From: <Osborne>, "Justin (osbornji)" <osbornji@ucmail.uc.edu>
Date: Tuesday, July 31, 2012 9:33 AM
To: Paula Smith <smithp8@ucmail.uc.edu>
Subject: Determining human subject research

Dr. Smith,

The Chair has reviewed your study titled, "The Impact of solitary confinement on subsequent inmate institutional behavior" and has a question he needs clarified before making a determination:

1. **Please confirm that no identifiable data will be accessed.**

You can respond directly to this email with your response.

Thank you,

Justin Osborne, BA, CIP
Research Compliance Specialist
University of Cincinnati IRB
University Hall, Suite 300
51 Goodman Drive
Cincinnati, Ohio 45267
Email: justin.osborne@uc.edu
Google Talk: irbjustin@gmail.com
Phone# 513-558-2087
Fax# 513-558-4111

Appendix C
ODRC Research Data Request Approval

Research Proposal Approval

I. Proposal Information

Title: The Effects of Solitary Confinement on Inmate Behavior

Submitted by: Paula Smith, Ph.D. and Edward Latessa, Ph.D.
Name

665 Dyer Hall, School of Criminal Justice, Cincinnati, OH 45221
Address

Telephone: (513) 652-4419; Email: paula.smith@uc.edu
Telephone Number and E-mail Address (optional)

Date Submitted: 07/31/2012

II. Research Agreement

The individual submitting this research proposal has read and agrees to the following conditions:

- Confidentiality of subjects' identity will be maintained
- Obtain the signature of subjects on Informed Consent Form, if needed.
- A copy of the results will be provided to the Human Subjects Research Review Committee.
- The signature of the research advisor will be obtained if research is part of an educational requirement.
- The research design is in accordance with accepted standards regarding human subjects' rights.
- No compensation of any kind will be given to inmates for their participation in the research.

Researcher: _____ Associate Professor
(Signature) (Title)

School of Criminal Justice, University of Cincinnati
(Academic Institution or Other Agency Affiliation)

Advisor: _____ _____
(If Applicable) (Signature) (Title)

(Academic Institution or Other Agency Affiliation)

III. Approval Signatures

John Y Chin — 08-17-2012
Research Review – Operation Support Center — Date

Edward Latessa — 8-21-12
Operation Support Center, Director/Designee — Date

S Van Dine — 8/24/12
Managing Officer/Field Supervisor — Date

DRC1827 (11/11)

Appendix D
ODRC Rules of Conduct

5120-9-06 **Inmate rules of conduct.**

(A) The disciplinary violations defined by this rule shall address acts that constitute an immediate and direct threat to the security or orderly operation of the institution, or to the safety of its staff, visitors and inmates, (including the inmate who has violated the rule,) as well as other violations of institutional or departmental rules and regulations.

(B) Dispositions for rule violations are defined in rules 5120-9-07 and 5120-9-08 of the Administrative Code.

(C) Rule violations: Assault and related acts, rules 1 through 7; threats, rules 8 through 10; sexual misconduct, rules 11 through 14; riot, disturbances and unauthorized group activity, rules 15 through 19; resistance to authority, rules 20 through 23; unauthorized relationships and disrespect, rules 24 through 26; lying and falsification, 27 and 28; escape and related conduct, rules 29 through 35; weapons, rules 36 through 38; drugs and other related matters, rules 39 through 43; gambling, dealing and other related offenses, rules 44 through 47; property and contraband, rules 48 through 51; fire violations, rules 52 through 53; telephone, mail and visiting, rules 54 through 56; tattooing and self-mutilation, rules 57 through 58; general provisions, rules 59 through 61 as follows:

(1) Causing, or attempting to cause, the death of another.

(2) Hostage taking, including any physical restraint of another.

(3) Causing, or attempting to cause, serious physical harm to another.

(4) Causing, or attempting to cause, physical harm to another.

(5) Causing, or attempting to cause, physical harm to another with a weapon.

(6) Throwing, expelling, or otherwise causing a bodily substance to come into contact with another.

(7) Throwing any other liquid or material on or at another.

(8) Threatening bodily harm to another (with or without a weapon.)

(9) Threatening harm to the property of another, including state property.

(10) Extortion by threat of violence or other means

(11) Non-consensual sexual conduct with another, whether compelled:

(a) By force,

(b) By threat of force,

(c) By intimidation other than threat of force, or,

(d) By any other circumstances evidencing a lack of consent by the victim.

(12) Non-consensual sexual contact with another, whether compelled:

(a) By force.

(b) By threat of force,

(c) By intimidation other than threat of force, or,

(d) By any other circumstances evidencing a lack of consent by the victim.

(13) Consensual physical contact for the purpose of sexually arousing or gratifying either person.

(14) Seductive or obscene acts, including indecent exposure or masturbation; including, but not limited, to any word, action, gesture or other behavior that is sexual in nature and would be offensive to a reasonable person.

(15) Rioting or encouraging others to riot.

(16) Engaging in or encouraging a group demonstration or work stoppage.

(17) Engaging in unauthorized group activities as set forth in paragraph (B) of rule 5120-9-37 of the Administrative Code.

(18) Encouraging or creating a disturbance.

(19) Fighting - with or without weapons, including instigation of, or perpetuating fighting.

(20) Physical resistance to a direct order.

(21) Disobedience of a direct order.

(22) Refusal to carry out work or other institutional assignments.

(23) Refusal to accept an assignment or classification action.

(24) Establishing or attempting to establish a personal relationship with an employee, without authorization from the managing officer, including but not limited to:

(a) Sending personal mail to an employee at his or her residence or another address not associated with the department of rehabilitation and correction,

(b) Making a telephone call to or receiving a telephone call from an employee at his or her residence or other location not associated with the department of rehabilitation and correction,

(c) Giving to, or receiving from an employee, any item, favor, or service,

(d) Engaging in any form of business with an employee; including buying, selling, or trading any item or service,

(e) Engaging in, or soliciting, sexual conduct, sexual contact or any act of a sexual nature with an employee.

(f) For purposes of this rule "employee" includes any employee of the department and any contractor, employee of a contractor, or volunteer.

(25) Intentionally grabbing, or touching a staff member or other person without the consent of such person in a way likely to harass, annoy or impede the movement of such person.

(26) Disrespect to an officer, staff member, visitor or other inmate.

(27) Giving false information or lying to departmental employees.

(28) Forging, possessing, or presenting forged or counterfeit documents.

(29) Escape from institution or outside custody (e.g. transport vehicle, department transport officer, other court officer or law enforcement officer, outside work crew, etc.) As used in this rule, escape means that the inmate has exited a building in which he was confined; crossed a secure institutional perimeter; or walked away from or broken away from custody while outside the facility.

(30) Removing or escaping from physical restraints (handcuffs, leg irons, etc.) or any confined area within an institution (cell, recreation area, strip cell, vehicle, etc.)

(31) Attempting or planning an escape.

(32) Tampering with locks, or locking devices, window bars; tampering with walls floors or ceilings in an effort to penetrate them.

(33) Possession of escape materials; including keys or lock picking devices (may include maps, tools, ropes, material for concealing identity or making dummies, etc.)

(34) Forging, possessing, or obtaining forged, or falsified documents which purport to effect release or reduction in sentence.

(35) Being out of place.

(36) Possession or manufacture of a weapon, ammunition, explosive or incendiary device.

(37) Procuring, or attempting to procure, a weapon, ammunition, explosive or incendiary device; aiding, soliciting or collaborating with another person to procure a weapon, ammunition, explosive or incendiary device or to introduce or convey a weapon, ammunition, explosive or incendiary device into a correctional facility.

(38) Possession of plans, instructions, or formula for making weapons or any explosive or incendiary device.

(39) Unauthorized possession, manufacture, or consumption of drugs or any intoxicating substance.

(40) Procuring or attempting to procure, unauthorized drugs; aiding, soliciting, or collaborating with another to procure unauthorized drugs or to introduce unauthorized drugs into a correctional facility.

(41) Unauthorized possession of drug paraphernalia.

(42) Misuse of authorized medication.

(43) Refusal to submit urine sample, or otherwise to cooperate with drug testing, or mandatory substance abuse sanctions.

(44) Gambling or possession of gambling paraphernalia.

(45) Dealing, conducting, facilitating, or participating in any transaction, occurring in whole or in part, within an institution, or involving an inmate, staff member or another for which payment of any kind is made, promised, or expected.

(46) Conducting business operations with any person or entity outside the institution, whether or not for profit, without specific permission in writing from the warden.

(47) Possession or use of money in the institution.

(48) Stealing or embezzlement of property, obtaining property by fraud or receiving stolen, embezzled, or fraudulently obtained property.

(49) Destruction, alteration, or misuse of property.

(50) Possession of property of another.

(51) Possession of contraband, including any article knowingly possessed which has been altered or for which permission has not been given.

(52) Setting a fire; any unauthorized burning.

(53) Tampering with fire alarms, sprinklers, or other fire suppression equipment.

(54) Unauthorized use of telephone or violation of mail and visiting rules.

(55) Use of telephone or mail to threaten, harass, intimidate, or annoy another.

(56) Use of telephone or mail in furtherance of any criminal activity.

(57) Self-mutilation, including tattooing.

(58) Possession of devices or material used for tattooing.

(59) Any act not otherwise set forth herein, knowingly done which constitutes a threat to the security of the institution, its staff, other inmates, or to the acting inmate.

(60) Attempting to commit; aiding another in the commission of; soliciting another to commit; or entering into an agreement with another to commit any of the above acts.

(61) Any violation of any published institutional rules, regulations or procedures.

(D) No inmate shall be found guilty of a violation of a rule of conduct without some evidence of the commission of an act and the intent to commit the act.

(1) The act must be beyond mere preparation and be sufficiently performed to constitute a substantial risk of its being performed.

(2) "Intent" may be express, or inferred from the facts and circumstances of the case.

(E) Definitions: The following definitions shall be used in the application of these rules.

(1) "Physical harm to persons" means any injury, illness or other physiological impairment, regardless of its gravity or duration.

(2) "Serious physical harm to persons" means any of the following:

(a) Any mental illness or condition of such gravity as would normally require hospitalization or prolonged psychiatric treatment;

(b) Any physical harm that carries a substantial risk of death;

(c) Any physical harm that involves some permanent incapacity, whether partial or total, or that involves some temporary, substantial incapacity;

(d) Any physical harm that involves some permanent disfigurement or that involves some temporary, serious disfigurement;

(e) Any physical harm that involves acute pain of such duration as to result in substantial suffering or that involves any degree of prolonged or intractable pain.

(3) "Sexual conduct" means vaginal intercourse between a male and female; anal intercourse, fellatio, and cunnilingus between persons regardless of sex; and, without privilege to do so, the insertion, however slight, of any part of the body or any instrument, apparatus, or other object into the vaginal or anal cavity of another. Penetration, however slight, is sufficient to complete vaginal or anal intercourse.

(4) "Sexual contact" means any touching of an erogenous zone of another, including without limitation the thigh, genitals, buttock, pubic region, or, if the person is a female, a breast, for the purpose of sexually arousing or gratifying either person.

(5) "Possession" means either actual or constructive possession and may be inferred from any facts or circumstances that indicate possession, control or ownership of the item, or of the container or area in which the item was found.

(6) "Unauthorized drugs," for the purposes of this rule, refers to any drug not authorized by institutional or departmental policy including any controlled substance, any prescription drug possessed without a valid prescription, or any medications held in excess of possession limits.

(7) "Extortion," as used in these rules, means acting with purpose to obtain any thing of benefit or value, or to compel, coerce, or induce another to violate a rule or commit any unlawful act.

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5120-9-06 7

Appendix E
ODRC Rule Violations Included within Categories of Inmate Misconduct

Misconduct Category	Ohio DRC inmate rule numbers
Violent	1, 2, 3, 4, 5, 6, 11, 12, 19, 36, 37
Non-violent	7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61
Drug	39, 40, 41, 42, 43

Appendix F
Criminal Offenses Included within Categories of Offense Type

Offense Category	Offenses
Violent	Aggravated assault, child abuse, domestic violence, extortion, harassment, intimidation, kidnapping, manslaughter, menacing/threating, murder/homicide, offenses against child/family, other assault, robbery, riot, sexual battery/rape, sexual offense/corrupting a minor, violation of protection order, weapons
Non-violent	Arson, breaking and entering, bribery, burglary, burglary tools, child support, contempt of court, escape, failure to appear, failure to register as sex offender, failure to notify/verify change of address—sex offender, forgery, fraud, judicial sanction, making false alarms, money laundering, obstruction of justice, participating in criminal gang, prostitution, public peace/disturbance, stolen property, stolen vehicle, tampering with evidence, theft, traffic related, trespassing, vandalism
Drug	Drug abuse, drug manufacturing, drug possession, drug trafficking, DWI

Appendix G
ODRC Types of Solitary Confinement

5120-9-11 **Security control and disciplinary control.**

(A) An inmate may be placed in security control:

(1) When needed to facilitate an investigation prior to the issuance of a conduct report or other administrative action, criminal prosecution; and/or,

(2) Pending a hearing before the rules infraction board (RIB);

(a) When the inmate poses a threat or danger to himself or others, to institutional property, or to the security of the institution; and/or,

(b) When the inmate poses a threat of disruption to the orderly operation of the institution.

(3) Pending transfer to another institution;

(a) When the inmate poses a threat or danger to himself or others, to institutional property, or to the security of the institution; and/or,

(b) When the inmate poses a threat of disruption to the orderly operation of the institution.

(c) The inmate's security level is incompatible with the security level of the general population.

(4) As a temporary housing assignment for inmates to facilitate an inmate's appearance in judicial or administrative proceedings.

(B) The deputy warden of operations, or designee, must approve the placement of an inmate in security control. This approval shall be written, and shall summarize the reasons for placement in security control. The deputy warden shall forward a copy of this approval to the warden.

(C) An inmate may be held in security control pursuant to an investigation for the following periods:

(1) The deputy warden of operations may authorize an inmate to be held in security control pursuant to an investigation for up to seven days.

(2) If the investigation has not concluded at the end of the initial seven day period, the warden may authorize that the inmate be held in security control for an additional seven days. This authorization shall be in writing with a copy sent to the appropriate regional director.

(3) If the investigation is not completed within this fourteen day period, the warden may request that the regional director approve retaining the inmate in security control for an additional seven days.

(4) After twenty-one days, upon the warden's request, the director or director's designee may authorize holding an inmate in security control for investigative purposes until the completion of the investigation when,

(a) The matter under investigation involves the commission or possible commission of a felony,

(b) The investigation cannot be completed within twenty-one days, and,

(c) Releasing the inmate to general population would jeopardize the safety of the inmate or any other individual, the successful completion of the investigation, or the security of the institution.

The decision of the director or the director's designee shall be in writing and shall state the anticipated duration of the extension and the reason therefore. The extension may be renewed so long as the conditions described in this rule continue to exist.

(D) The hearing of the rule infraction shall be held within three business days of the issuance of the conduct report unless prevented by exceptional circumstances, unavoidable delays or reasonable postponements. However, the hearing shall be held no longer than seven business days following the issuance of the conduct report. Unless waived, the inmate shall be afforded twenty-four hours notice prior to the hearing pursuant to rule 5120-9-08 of the Administrative Code.

(E) Disciplinary control: An inmate who has been found guilty of a rule violation by the RIB, pursuant to rule 5120-9-08 of the Administrative Code, may be placed in disciplinary control. An RIB panel may impose up to fifteen days in disciplinary control for a single violation or series of violations arising out of a single event. An RIB panel may impose consecutive penalties of up to fifteen days for two or more unrelated violations, not to exceed a total of thirty days. An RIB panel may impose an additional fifteen days in disciplinary control if the panel determines that an inmate violated a rule while placed in disciplinary control. No combination of offenses shall require an inmate to continuously serve more than thirty days in disciplinary control

(F) Inmates placed in either security control or disciplinary control shall receive the following cell privileges:

(1) Access to legal material and services;

(2) Mail and kite privileges;

(3) Opportunity for recreation exercise, outside of the cell, no less than one hour per day, five days per week;

(4) Opportunity to shower and shave no less than five times per week;

(5) Personal hygiene articles, including, at minimum, a toothbrush, toothpaste, deodorant and soap;

(6) Cell furnishings to include a toilet, wash basin, running water, bunk, mattress, pillow, and sheets and blankets adequate for current weather conditions;

(7) Adequate state-issued clothing and apparel;

(8) Personal shower shoes;

(9) Adequate light for reading;

(10) Access to medical services and/or mental health services as needed;

(11) Adequate food;

(12) Access to administrative rules in the 5120-9 series;

(13) Access to approved department policies;

(14) Visits by authorized department staff;

(15) Access to cleaning articles for cell sanitation, as approved by the warden or designee.

(G) Abuse of cell privileges may be dealt with summarily by the staff member on duty in the disciplinary control or security control area (except that in no event shall access to kite, medical, mental health, or legal services be denied). This action shall then be reported by such staff member to his superior for review and approval. This action shall also be reported in writing to the deputy warden of operations. The deputy warden of operations shall forward to the managing officer a weekly list of those inmates in disciplinary control who have had cell privileges denied, the length of time denied, and the reasons therefore.

(H) The RIB may order restrictions on personal privileges following an inmate's abuse of such privileges or facilities or when such action is deemed necessary by the warden for the safety or security of the institution, or the well-being of the inmate. In no event shall access to kite, medical, mental health, or legal services be denied. Such restrictions shall continue only as long as is reasonably necessary

(I) Any denial of cell privileges shall be reported in writing to the deputy warden of operations, who shall be responsible for submitting a weekly report to the warden of those inmates who have been denied cell privileges, the specific privileges denied, length of time the privilege was denied, and reasons therefore.

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5120-9-12: 12/31/76, 4/5/76,
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5120-9-11 4

5120-9-13.1 **Local control.**

(A) Each institution required to do so by the director shall establish an area of such institution to be designated a local control unit.

(B) An inmate may be placed into local control if the warden determines after a hearing that:

(1) The inmate has demonstrated a chronic inability to adjust to the general population, or

(2) The inmate's presence in the general population is likely to seriously disrupt the orderly operation of the institution.

(C) The hearing shall be conducted by a hearing officer appointed by the warden. The hearing officer may not be a member of the rules infraction board who has heard any related conduct reports. The following procedure shall apply:

(1) The hearing may be initiated upon the recommendation of the rules infraction board, or the warden.

(2) At least forty-eight hours before the hearing, unless waived by the inmate, the inmate will receive written notice advising him of the purpose of the hearing and his right to be heard concerning the proposed placement.

(3) The purpose of the hearing is to gather information, conclude whether or not the criteria specified in paragraph (B) of this rule has been met, and make a recommendation to the warden.

(4) After considering all relevant information, including any statement made by the inmate, the hearing officer shall forward to the warden a conclusion and recommendation. The hearing officer's report shall include a summary of the inmate's statement and the basis of any conclusion. If the hearing officer concludes that the inmate meets the criteria for local control placement, the hearing officer shall state which of the two criteria under paragraph (B) of this rule was found.

(D) The warden or designee shall review the report of the hearing officer, and after considering the conclusions of the hearing officer, and any information provided by the inmate, conclude whether the inmate meets either of the criteria specified in paragraph (B) of this rule and whether or not the inmate should be placed into local control.

(E) The report of the hearing officer including the conclusion and recommendations are advisory only. The warden is not required to place an inmate in local control nor

precluded from placing an inmate in local control because of any conclusion or recommendation of the hearing officer.

(F) Within forty-eight hours of making the decision whether to place the inmate in local control, the warden will cause the inmate to receive a written notice of his decision. This notice will include:

(1) Which criteria under paragraph (B) of this rule he has found to exist; and

(2) What action or actions of the inmate or what other specific factors caused him to reach his conclusion.

(G) Inmates placed in local control may appeal that placement to the director or his designee within fifteen calendar days of receipt of the warden's written decision. The appeal shall be on a form designed for that purpose. The director or designee will review the placement to verify that the procedures required in this rule have been provided and that there is some evidence that the placement is consistent with the criteria in paragraph (B)(1) or (B)(2) of this rule. Written notice of the decision will be sent to the inmate.

(H) Placement in local control shall be for an indefinite period, but shall not exceed one hundred eighty days unless the prior written approval of the director or his designee has been obtained. Where an inmate has remained in local control for one hundred eighty days, the managing officer or designee may recommend a security level status change or an institutional transfer if he decides that the inmate should not be returned to general population.

(I) The status of every inmate in local control shall be reviewed monthly by the managing officer. The warden may designate any or all of the review responsibilities to an individual, subject to the warden's approval of the final recommendation. Such review process shall include an interview of the inmate by a person designated by the managing officer, unless the inmate waives the interview. The managing officer shall decide whether to:

(1) Continue the local control placement;

(2) Release the inmate to the general population; or

(3) Recommend a security supervision review and/or an institutional transfer, which would result in a release from local control following transfer.

(J) The managing officer shall consider all of the following when reviewing an inmate's status in local control:

(1) The seriousness of the activity which caused the initial placement;

(2) The inmate's conduct following the placement; and

(3) The inmate's demonstrated attitude.

If the inmate is continued in local control upon any review of his status, the reasons for such continuance shall be recorded in his file. Anytime during a thirty day interval the managing officer may release the inmate based upon just cause.

(K) Privileges for inmates in local control shall be the same as for inmates in disciplinary or security control pursuant to rule 5120-9-11 of the Administrative Code.

(L) Inmates entering or leaving the local control unit shall be thoroughly searched.

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5120-9-14 **Protective control.**

(A) The director or designee shall designate one or more institutions to maintain housing areas designated as protective control. These protective control areas shall be used to house inmates that, due to personal physical safety concerns, need to be separated from the general inmate population.

(B) Either the inmate or a staff member may initiate protective control consideration. Such request or referral shall be investigated and heard by a protective control committee, which shall consist of two members appointed by the warden. One member of the committee shall be designated chairman. No member of the protective control committee shall have been a member of a rules infraction board who heard any related conduct reports.

(C) An inmate requesting or referred for protective control consideration may be held in security control pending the protective control investigation and hearing. A protective control hearing shall be held within seventy-two hours of the protective control request or referral, unless additional investigation is necessary and approved by the warden. In such cases the inmate shall be promptly notified of the delay.

(D) The inmate shall be notified no less than forty-eight hours in advance of the protective control hearing, unless such notice has been waived. At the hearing the inmate shall be permitted to state his position concerning the proposed placement. The committee shall evaluate the inmate's need for protection from another inmate(s) based upon the inmate's statement, and all other relevant documentation and information available to it. The committee can recommend to the warden:

(1) Protective control placement,

(2) Housing unit separation,

(3) Institutional transfer or,

(4) Any other appropriate placement or administrative action.

(E) Both panel members must concur in the recommendation. In the event there are conflicting recommendations, the tie shall be broken by a staff member designated by the warden, who shall cast the deciding third vote. The warden's designee shall vote only after reviewing the complete statement from the inmate and other available documentation to include, but not limited to, the investigation report.

(F) The committee shall promptly communicate its recommendation to the inmate and advise the inmate of his right to file objections to the committee's recommendation to the warden. The committee shall forward its written recommendation to the warden, including their reasons for such a decision.

(G) The warden shall consider the committee's recommendation and any other relevant information available. The warden's decision shall be communicated in writing to

the inmate. If the warden has decided to recommend protective control placement and the inmate objects, the inmate may file objections to the bureau of classification.

(H) If the warden recommends placement in protective control, the warden shall forward this recommendation, together with the protective control committee's recommendation and any additional relevant documentation to the bureau of classification. The bureau of classification shall consider the recommendations, documentation and inmate's objections, if any, along with any additional information available to them. The bureau of classification shall then decide whether or not to place the inmate in protective control. The bureau of classification shall notify the inmate in writing of its decision and response to any objections. Any institutional transfer which is necessary to implement the placement in protective control shall be accomplished consistent with rule 5120-9-21 of the Administrative Code.

(I) To the extent the safety, security and orderly management of inmates confined in protective control can be maintained, such inmates shall be provided privileges and programming consistent with privileges and programming provided to general population inmates. Abuse of cell privileges shall be addressed in accordance with paragraph (H) of rule 5120-9-11 of the Administrative Code.

(J) The status of every inmate placed in protective control shall be reviewed by the reclassification committee every ninety days. The reclassification committee may recommend continuation in protective control, release to the general inmate population, or any other option provided in paragraph (D) of this rule. Every six months the warden or designee shall interview the inmate and determine if continued placement in protective control is necessary. The reclassification committee is not required to review the inmate's placement when an interview by the warden or designee is scheduled. If it is determined that continued placement in protective control is unnecessary the warden shall forward the recommendation, along with other relevant documentation to the bureau of classification. The bureau of classification shall make the final determination and effectuate any necessary institutional transfer.

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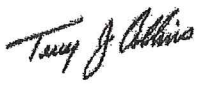

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