Article

Gender and the Effect of Disciplinary Segregation on Prison Misconduct

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Abstract
Scholars and policymakers have advanced different arguments for why restrictive housing may improve or worsen inmate behavior, yet few studies exist that assess the impact of this housing on such outcomes. This study draws upon prior theory and research to hypothesize that inmate adjustment will worsen after placement in disciplinary segregation among a 3-year admission cohort of inmates from a large Midwestern state department of corrections ($N = 40,979$), and further that this effect will be more harmful to men. The results of our propensity score matching analyses reveal the use of disciplinary segregation is associated with a greater probability of misconduct among men and has no appreciable effect on women. These findings challenge the view that disciplinary segregation is an effective strategy for improving inmate behavior in prison. This work further highlights the need for continued research on the utility of restrictive housing.

Keywords
restrictive housing, disciplinary segregation, institutional misconduct, prison

Introduction

During the era of mass incarceration, prison officials have been left with few options for managing inmates in overburdened facilities. As a result, many prison systems across the United States have expanded their use of restrictive housing, a practice that

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is often referred to as solitary confinement (Frost & Monteiro, 2016; Labrecque & Smith, 2013). In general, this specialized housing involves isolation in a single cell for 22 to 24 hr per day with limited opportunities for meaningful interactions with staff or other inmates (Browne, Cambier, & Agha, 2011). Correctional authorities place inmates in restrictive housing for one of three primary reasons (Mears, 2016). First, it is used for managerial purposes, such as isolating an inmate who fails to appropriately adjust in the general population, or when it is believed one's presence in the general population will disrupt the orderly operation of the prison system (i.e., administrative segregation). Second, it is used to separate vulnerable inmates from the general population due to personal safety concerns (i.e., protective custody). Finally, it is used as a formal punitive sanction in response to an act of unwanted institutional misbehavior (i.e., disciplinary segregation).

Broadly speaking, the use of restrictive housing has been justified by many policy-makers and justice officials on the assumption that it is necessary for ensuring safety and order throughout the prison system (see Mears & Reisig, 2006; Pizarro, Zgoba, & Haugebrook, 2014). Current estimates indicate that this practice is used commonly in U.S. prisons; approximately 64,000 inmates are held in this type of setting on any given day, and more than 320,000 are placed in restrictive housing over the course of a given year (Beck, 2015). Aside from the ethical and legal issues that the use of restrictive housing raises (see, for example, American Civil Liberties Union, 2014; Amnesty International, 2012), a critical question remains: Does this correctional policy achieve one of its central goals, namely, that of improving the behavior of those who are placed in it?

To date, there has been limited empirical research that examines the role that restrictive housing plays in shaping inmate behavior in prison (see, however, Labrecque & Smith, 2019a; Lucas & Jones, 2019; Morris, 2016). The scant amount of scholarship is notable given that restrictive housing represents one of the most severe punishments that can be imposed on inmates (Butler & Steiner, 2017; Mears, Mancini, Beaver, & Gertz, 2013). It is notable, too, given the concerns that have been raised about the possibility that certain groups of inmates, women in particular, might suffer unique harms in this type of housing (see, for example, American Civil Liberties Union, 2014; Dell, Fillmore, & Kilty, 2009; Martel, 2001). It is notable, not least, because restrictive housing constitutes a policy whose benefits have been largely assumed and whose logic—incapacitate certain violent and disruptive inmates and deter both these and the general population of inmates—are increasingly being questioned (Frost & Monteiro, 2016; Mears, 2016).

The goal of this work, then, is to assess if the use of restrictive housing for punitive purposes (i.e., disciplinary segregation) improves or worsens inmate behavior and if this effect varies among men and women. To this end, drawing on prior research, we test hypotheses that inmates who experience stays in disciplinary segregation will engage in more institutional misconduct and that this effect will be more pronounced for men than it is for women. To test these hypotheses, we use a 4-year admission cohort of inmates incarcerated in a large Midwestern State Department of Corrections. In what follows, we begin with a discussion of prior research and the theoretical work

that guides our analyses. We then describe the data, discuss the findings, and conclude by discussing the study's implications for research and policy.

Background

Prison officials are responsible for ensuring institutional safety and security, which is typically assessed by levels of violence and disorder (DiIulio, 1987). To advance the understanding of social order and to inform policy, scholars have sought to identify influences on inmate behavior (see, for example, Gendreau, Goggin, & Law, 1997; Gonçalves, Gonçalves, Martins, & Dirkzwager, 2014; Steiner, Butler, & Ellison, 2014). Many theoretical accounts focus on the influence that one's prior attitudes and behaviors have on the way that they adjust to and act in prison (Irwin & Cressey, 1962; Thomas & Foster, 1973; Zamble & Porporino, 1988) or on the impact of the "pains of imprisonment" on various behavioral indicators (Goodstein, MacKenzie, & Shotland, 1984; Sykes, 1958).

Alongside of importation theory and deprivation-focused theoretical perspectives, criminological theories of offending have also been used to understand inmate behavior (see, for example, Blevins, Listwan, Cullen, & Jonson, 2010; Listwan, Sullivan, Agnew, Cullen, & Colvin, 2013; Morris, Carriaga, Diamond, Piquero, & Piquero, 2012). Prisons, for example, may create strain (Agnew, 1992), increase exposure to antisocial associates (Akers, 1973), bestow a negative label (Braithwaite, 1989), weaken social bonds (Sampson & Laub, 1993), and increase defiance (Sherman, 1993).

We seek to build on this work by focusing on one unique aspect of contemporary corrections—the widespread use of disciplinary segregation, a type of restrictive housing, for punishing inmates. We attempt at the same time to respond to calls to understand better ways in which this form of punishment may differ in its effects on some groups of inmates. In particular, we seek to build upon the work of Blevins et al. (2010) and Broidy and Agnew (1997) to anticipate how disciplinary segregation may influence inmates and exert a differential effect among men and women, respectively (see also Listwan et al., 2013; Morris et al., 2012).

General Strain Theory (GST) and Prison Adjustment

One shortfall in work on restrictive housing more generally has been, as scholars have emphasized, limited attention to theorizing how segregation experiences may affect inmates (see, generally, Garcia, 2016; Mears & Reisig, 2006). Here, we draw on GST as one basis for anticipating an effect of disciplinary segregation and for explaining potential gender differences in these effects. There are other grounds for anticipating the impact of disciplinary segregation on inmate behavior. For example, it is possible that this type of housing may produce a deterrent effect. Here, we focus on GST rather than deterrence for two reasons. First, although disciplinary segregation can be used with women, and although prison scholarship points to differences in how women and men may experience incarceration, little research exists that documents the use or effects of segregation (see, generally, Garcia, 2016). Second, GST provides clear grounds for anticipating differences between men and women.

According to GST, there are three sources of strain: (1) the failure to achieve positively valued goals, which occur when there is disjunction between (a) aspirations and achievements, (b) expectations and achievements, and (c) just/fair outcomes and actual outcomes; (2) the removal of positively valued stimuli; and (3) the presentation of noxious stimuli (Agnew, 1992). These strains can lead one to experience a variety of negative affective states, including feelings of disappointment, depression, fear, frustration, and anger. These negative emotions then create pressure to reduce or eliminate the source of strain. There are a wide range of coping strategies that can be used in the attempt to rid oneself of these unpleasant emotions, including cognitive, emotional, and behavioral adaptations to strain. GST posits that antisocial behavior is one potential coping response to the experience of strain (Agnew, 2006).

Exposure to any source of strain may contribute to antisocial behavior. However, the types of strains that appear most conducive to a criminal response include those that are (a) large in magnitude, (b) perceived as unjust, (c) associated with low self-control, and (d) create a pressure or incentive for criminal coping (Agnew, 2001). Strains increase the likelihood of offending through their impact on negative emotional states. Anger appears to be the most influential emotion because it increases one's sensitivity to strain, incites retaliation, provides enough vigor to act upon frustrations, and lowers inhibitions (Agnew, 2006). At the same time, some factors, such as available social control and social support, may condition the effect of strain on crime (Agnew, 2006).

A large body of work has found support for GST; most studies reveal that strain is positively associated with antisocial behavior (see, for example, Agnew, 2006; Akers & Sellers, 2012; Broidy, 2001; Cullen, Agnew, & Wilcox, 2017). However, some studies fail to find evidence of a conditioning effect hypothesized by GST (see, for example, Hoffman & Cerbone, 1999; Hoffman & Miller, 1998; Mazerolle & Piquero, 1998; Paternoster & Mazerolle, 1994). Although most GST research has focused on criminal behavior, scholars argue that GST may help explain adjustment in prison. Blevins et al. (2010), for example, argue that GST is well suited to explain prison violence and misconduct because it can be seen as encompassing importation and deprivation theories and includes additional factors, such as emotions and coping, that these theories do not address. Two recent studies illustrate this argument—they found that prison-based strain is positively associated with inmate misconduct (Morris et al., 2012) and post-release recidivism (Listwan et al., 2013), respectively.

Gender, GST, and Prison Adjustment

In addition to the use of GST to explain prison misconduct, it has also been used to account for gender differences in offending (e.g., Celinska & Sung, 2014; Gover, Pérez, & Jennings, 2008). According to Broidy and Agnew (1997), although the general process of offending is similar among men and women, the two groups differ in the way that they experience strains and negative emotions, which in turn contributes to differential criminal involvement. More specifically, Broidy and Agnew (1997) use the GST framework to identify three reasons why men are more likely to engage in

crime: (a) men are subject to different strains than women, and, in particular, those that are more conducive to crime; (b) men are more likely to respond to strain with anger; and (c) men are more likely to respond to anger with crime.

Men may also lack the coping resources and skills that allow for reliance on pro-social alternatives rather than criminality when responding to strain (Hoffmann & Su, 1997). At the same time, women may be more likely to suppress anger with self-deprecating emotions such as guilt, anxiety, and depression, whereas men may be more likely resort to anger (Broidy & Agnew, 1997). The end result is a greater likelihood of offending among men when compared to women. Empirical tests of this argument have generally lent support to it (Agnew, 2006; Hay, 2003; Jennings, Piquero, Gover, & Pérez, 2009; Piquero & Sealock, 2004). As we discuss below, these findings have implications for anticipating gender differences in the effect of disciplinary segregation.

Disciplinary Segregation, Gender, GST, and Prison Adjustment

Drawing on GST and prior research, we argue that placement in disciplinary segregation induces the types of strains that contribute to antisocial behavior. Several propositions ground this argument, and, in turn, the hypotheses discussed further below. Our first proposition is that *disciplinary segregation settings are severely strainful environments that inmates perceive to be unjust*. Indeed, by design, conditions in disciplinary segregation entail substantially more deprivations than those imposed upon the general prison population. For example, inmates are often isolated in a single cell for up to 24 hr of the day and almost all forms of social interaction with staff and other inmates are eliminated. Inmates must eat, sleep, and go to the bathroom alone in their cells, and they are only allowed out of their cell to shower or to exercise in a small fenced-in yard area by themselves. Before leaving their cell for any reason, inmates are hand-cuffed, and sometimes shackled at the waist and placed in leg irons. Visitation is restricted in these units, and when allowed, the interaction with the family member often takes place via phone; both parties sit on opposite sides of a thick glass window separator (see Butler, Johnson, & Griffin, 2014). Research further indicates there are disparities in how segregation is used within and across prisons, which may lead to a greater distrust of prison authorities (see Butler & Steiner, 2017; Cochran, Toman, Mears, & Bales, 2018; Logan et al., 2017).

Second, *disciplinary segregation contributes to the types of negative affective states, such as anger, that have been shown to increase antisocial behavior*. Perhaps the most frequent critique leveled against the use of restrictive housing, generally, involves its negative effects on the psychological well-being of inmates (Haney, 2003; Kupers, 2008; Lovell, 2008; Scharff-Smith, 2006; Toch, 2003). Reviews suggest that isolation has detrimental effects on a wide range of mental health indicators (Morgan et al., 2016; see also Kapoor & Trestman, 2016). Although the majority of extant work focuses on the psychological impact of long-term segregation, the limited opportunities for social interaction and participation in programming in disciplinary segregation suggest the potential for harm in this type of confinement as well.

A third reason why disciplinary segregation may contribute to institutional misbehavior is that *inmates in this housing have fewer coping resources available.* As inmates adapt to the prison environment, they must find ways to cope with the various types of strain to which they are exposed. Some inmates may accept or adjust to these strains; yet, others who possess fewer coping strategies may be more likely to seek revenge through violation of prison rules or violent behavior (Blevins et al., 2010). The potential for segregation to inhibit prosocial coping is straightforward: the isolation and near-24-hr-per-day confinement all but preclude access to coping resources. Thus, when inmates return to the general prison population, where fewer external control mechanisms exist, they may be ill-prepared to cope well; in turn, the probability of violating institutional rules may increase.

A recent meta-analysis examining the predictors of placement in restrictive housing reveals that inmates in such settings tend to be younger, have more extensive criminal history records, worse institutional behavior performances, and more criminogenic needs than those in the general population (Labrecque, 2018). These dimensions align with those that a large body of scholarship suggests contributes to poor adjustment in prison (see, generally, Camp & Gaes, 2005; Gonçalves et al., 2014; Zamble & Porporino, 1988). Inmates in these settings also typically have more treatment needs; provision of treatment in this housing is, however, nominal (Butler et al., 2014; Smith, 2016). The absence of prosocial coping resources in disciplinary segregation in turn means that individuals in this housing may be more likely to seek recourse in antisocial coping strategies.

Collectively, the above considerations suggest warrant for anticipating that disciplinary segregation may increase inmate misconduct. In addition, however, there is the possibility that men and women may respond differently to placement in this housing. Research indicates that men and women experience and cope with strain in different ways. By extension, it can be anticipated that disciplinary segregation may have a differential effect on institutional misconduct among men and women. There is, for example, a growing body of work that suggests that women face many unique harms in restrictive housing settings (American Civil Liberties Union, 2014; Dell et al., 2009). Studies show that women in these settings have greater mental health and substance abuse needs compared to men (Thompson & Rubenfeld, 2013; Wichmann & Nafekh, 2001). And women in prison are also more likely to possess greater histories of trauma (Brennan, Breitenbach, Dieterich, Salisbury, & Van Voorhis, 2012; Liebling, 1994), to be the primary caregivers for young children (Coll, Surrey, Buccio-Notaro, & Molla, 1998), and to have a stronger desire for social networks (Jiang & Winfree, 2006; Martel, 2001).

One possibility, then, is that disciplinary segregation may lead to greater misconduct among women. However, recall that, according to GST, it is not just strain that influences criminal behavior, but rather how individuals cope or adapt to the strain (Broidy & Agnew, 1997). For example, men may be more likely to respond to the strain of disciplinary segregation through misconduct and, in particular, violence. By contrast, as prior work suggests, women may be more likely to internalize the anger that results from strain, which may manifest itself into social isolation, depression,

suicidal ideation, or refusal to participate in programs, rather than as overt institutional rule violations (Broidy & Agnew, 1997). The end result, then, is that disciplinary segregation may be more likely to increase misconduct and violence among men compared to women.

The foregoing considerations provide a theoretical foundation for anticipating that disciplinary segregation may adversely affect misconduct and for competing expectations about its effects on the misconduct patterns of men and women inmates, respectively. There are, however, other theoretical grounds on which to anticipate gender-specific effects of this type of housing. Ethnographic research, for example, has described the gendered nature of how men and women experience prison (see, for example, Irwin, 2005; Sharp & Marcus-Mendoza, 2001), which may translate into gendered differences in the effects of disciplinary segregation. For example, research suggests that women are more likely to participate in pseudo-families, communal activities, and other treatment services in prison (Jiang & Winfree, 2006; Kruttschnitt & Gartner, 2005) and that society encourages women to avoid risky situations, to empathize with others, and to value social relationships with friends, families, and others (Gartner, 2011). This scholarship further suggests that women may have more self-control and a greater ability to evaluate the consequences of their actions (Rebellon, Manasse, Agnew, Van Gundy, & Cohn, 2016; Walsh & Vaske, 2015). Not least, research indicates that women are less likely to engage in violence and other institutional rule violations than are men (Brennan & Austin, 1997; Celinska & Sung, 2014; Gover et al., 2008; Jiang & Winfree, 2006; Steiner & Wooldredge, 2014). In short, divergent lines of scholarship underscore the potential for men and women to respond differently to a prison experience, disciplinary segregation, that imposes isolation and significant restrictions.

This Study

This study responds to calls by scholars for greater understanding of the impacts of restrictive housing and how its effects may vary for different social groups (e.g., Frost & Monteiro, 2016; Mears, 2016). Specifically, we hypothesize that inmates who experience disciplinary segregation will be more likely than those who do not experience this type of housing to engage in institutional misconduct when they return to the general prison population. The logic is that disciplinary segregation presents inmates with more acute strains, and, at the same time, their underlying physical, mental health, and criminogenic needs remain unaddressed while in this housing. Accordingly, inmates will be ill-equipped to adjust to the isolation and will respond through misbehavior. We hypothesize, too, that segregation will be more likely to increase misconduct, as well as violence, among men than among women.

Data and Methods

Data for this study was collected from a large Midwestern State Department of Corrections. The sampling frame includes all inmates who were admitted into the

states' custody between July 1, 2007, and June 30, 2011. To be included, inmates had to spend at least 365 consecutive days in prison from their initial admission date. Furthermore, inmates were only included once during their first commitment in the observation period, regardless if they were admitted into the prison system multiple times during this time frame.

One reason for selecting this state is that there were a large number of inmates admitted into this system that met the inclusion criteria ($N = 40,979$).[1] Of particular significance for the present purposes, the large sample size allows for the investigation of the impacts of disciplinary segregation on women. This focus is important because prior restrictive housing evaluations have generally limited their analyses to only men in large part due to sample size limitations that precluded rigorous assessment of impacts on women. To our knowledge, this is the first study to assess if disciplinary segregation has differential effects on misconduct between men and women.

Ideally, our impact evaluation would involve random assignment to the disciplinary segregation and no disciplinary segregation treatment conditions. This experimental design would ensure that there would be no systematic differences between the groups before the treatment and thus that any differences in outcomes would be attributable to the experienced condition. This approach, however, is clearly not a realistic possibility given the ethical and moral issues it would raise. Given this reality, researchers must undertake quasi-experimental methodologies to assess the behavioral impact of residing in this type of housing.

One such approach is to match inmates with experience in disciplinary segregation to those with no experience in this type of housing on a wide range of theoretically relevant covariates. This approach, though, is problematic. Inmates who enter disciplinary segregation may do so at varying times throughout the course of incarceration, and they may do so repeatedly. For example, some inmates may be placed in disciplinary segregation within the first month of their incarceration, whereas others will be placed after their first year. Furthermore, some inmates may experience only one stay in this setting, whereas others will have 10 or more stays. There is, thus, no natural temporal starting point for measuring misconduct for the matched comparison group. Creating credible matches is also difficult because disciplinary segregation is the modal response for responding to rule violators in prison. In this study, for example, 61% of the inmates who were found guilty of an institutional misconduct in the first 3 months were also placed in disciplinary segregation during this same time period.

Accordingly, we adopt a variant of this approach. Specifically, we match inmates on information that is available at the earliest possible point in their prison stay. The logic is that by comparing inmates on key demographic and criminal history variables, some with an early experience in disciplinary segregation and some without such an experience, we are comparing groups with similar propensities for misconduct. A central premise to our approach flows from prior research that documents that prior offending is a strong predictor of prison misconduct (Cochran, Mears, Bales, & Stewart, 2014; DeLisi, 2003; Trulson, DeLisi, & Marquart, 2011). Accordingly, commission of a first infraction may be seen as largely random. That observation, coupled

with the fact that the bulk of inmates who commit an infraction are sent to segregation, suggests that segregation placements in the first 3 months can be viewed as flowing from random assignment. Put differently, after matching on prior record, the two groups should have similar probabilities of engaging in misconduct and thus of being placed in disciplinary segregation.[2] The estimated differences in post-segregation misconduct, therefore, provide potentially valid estimates of the impact of disciplinary segregation on subsequent behavior. As we discuss in the conclusion, however, the results should be viewed with caution. Alternative approaches, such as random assignment, would not be ethical or possible, and matching on in-prison misconduct over entire prison terms is not possible because inmates commit infraction and go into disciplinary segregation at varying times throughout entire prison terms. Here, the approach is to zero in on the first few months of incarceration, which is feasible but does not mean that the results necessarily result in valid estimates of impact. Ancillary analyses, however, reinforce the main analyses.

Dependent and Independent Variables

According to the departmental policy in the state system examined here, inmates can be placed in disciplinary segregation as a punishment for engaging in institutional misconduct as determined by the rules infraction board for up to 30 days, depending upon the severity of their initial violation and their behavior while in segregation.[3] We chose to focus on disciplinary segregation here because it is the most frequently used type of restrictive housing (see Beck, 2015). More specifically, we operationalized our independent variable as any placement in disciplinary segregation within the 3 months from the start of a prison sentence (1 = *placed in disciplinary segregation*, 0 = *not placed in disciplinary segregation*). The initial 3-month duration was selected for several reasons. First, it allowed us to have a 9-month follow-up period for everyone (i.e., Month 4 to Month 12). Second, it allowed inclusion of a larger number of cases to study.[4] Third, it ensured that estimated effects were not influenced by what otherwise would be the variable timing of when inmates experienced the housing.

Institutional misconduct is the dependent variable of interest; it is defined as a finding of guilt by a rule infraction board for any violation of the rules of conduct during the 9-month follow-up time period (1 = *had a rule violation*, 0 = *no rule violation*). We further separated this outcome into two dichotomous subcategories: violent/serious offenses (e.g., assault; 1 = *yes*, 0 = *no*) and non-violent/less serious offenses (e.g., damage to property, theft, drug use; 1 = *yes*, 0 = *no*). The dataset also included theoretically relevant demographic and criminal history factors that were recorded during the intake process into the prison system. These variables were used as covariates for matching and included age at intake (measured in years), race (1 = *Black*, 0 = *other*), serious mental illness (any recorded Axis I or Axis II diagnosis: 1 = *yes*, 0 = *no*), gang affiliation (any known association with a gang from a security threat group list: 1 = *yes*, 0 = *no*), incarceration history (prior incarceration: 1 = *yes*, 0 = *no*), sentence type (dummy variables for any violent, nonviolent, and drug convictions), sentence severity (dummy variables for most serious felony level conviction, F1 [most serious], F2,

F3, F4, F5 [least serious]), and initial custody level (dummy variables for *minimum, medium, close*, and *maximum*).[5]

Analyses

This study begins with a descriptive comparative analysis of the characteristics between the men and women inmates in the study. We then use logistic regression model to identify the factors available during the admission process that are associated with placement in disciplinary segregation within the first 3 months, one for men and one for women. Diagnostic tests suggest that multicollinearity is not a problem in the models. Finally, we use propensity score modeling (PSM) to separately match men and women who experienced disciplinary segregation in the first 3 months to those from the same gender who did not experience disciplinary segregation within this same time frame. Propensity score matching is useful in the current investigation because this procedure can help reduce potential biases that may be due to confounding variables (Rosenbaum & Rubin, 1983). To match, we used a one-to-one nearest neighbor matching method with a .01 tolerance level without replacement.[6] We then conduct a series of pre- and posttest analyses to evaluate the performance of each match. This includes calculating the appropriate *t*-test or chi-square statistic and the standardized percent bias statistic to assess group differences on individual variables, and the area under the curve (AUC) statistic to assess the overall group difference among all of the covariates. Once matched, the differences in the dependent variables are examined for both groups and chi-square tests are conducted to identify any statistically significant differences in the outcomes. Phi (ϕ) is used as a measure of association to indicate the magnitude, or strength, of the relationship between group placement and the dependent measures. Using Cohen's (1988) guidelines, absolute values of $\phi = .10, .30$, and $.50$ are considered indicative of small, medium, or large relationships, respectively.

Results

We begin first with a description of the men ($N = 37,309$) and women ($N = 3,671$) in our study. As can be seen in Table 1, these two groups differ appreciably from one another on nearly every dimension examined. For example, about one quarter of the women were Black (28%) compared to nearly half of the men (48%). Women were also twice as likely as men to have a record of a serious mental health diagnosis (63% vs. 28%). The largest group difference was found with respect to gang membership status, where less than 1% of women and nearly 21% of men had a verified gang affiliation. Men were more likely to have a more serious felony sentence and to have a conviction for a violent offense. Men were also more likely to receive a higher classification designation during the initial intake screening process and to begin a stay in disciplinary segregation within the first 3 months of their prison sentence (13% vs. 10%). Women who were placed in disciplinary segregation within the first 3 months ($N = 376$) experienced more placements during this time period

Table 1. Descriptive Statistics.

Variable	Men (N = 37,309) %/M (SD)	Women (N = 3,671) %/M (SD)
Age	31.9 (10.8)**	33.1 (9.8)
Black	48.1**	28.4
Serious mental illness	27.6**	63.2
Gang affiliation	20.9**	0.8
Prior incarceration	49.0**	29.1
Any violent conviction	58.9**	40.2
Any property conviction	45.1**	52.2
Any drug conviction	31.0**	35.7
Most serious felony level		
F1 (Most serious)	21.6**	14.1
F2	26.4*	24.4
F3	33.3	34.1
F4	13.7**	16.8
F5 (Least serious)	5.0**	10.7
Initial custody level		
Maximum	0.2*	0.0
Close	16.1**	12.5
Medium	55.3**	48.6
Minimum	28.2**	38.9
Any DS within 3 months	13.3**	10.2
Number of DS within 3 months[a]	1.2 (0.6)*	1.3 (0.7)
Total days in DS within 3 months[a]	13.2 (13.7)	13.2 (11.1)

Note. DS = disciplinary segregation.
[a]Estimates include only inmates who experienced DS within the first 3 months.
*$p \le .01$. **$p \le .001$.

($M = 1.3$ stays, $SD = 0.7$) compared to men ($N = 4,970$, $M = 1.2$ stays, $SD = 0.6$). The mean number of days spent in disciplinary segregation during this time period, however, did not differ between genders, with both groups averaging approximately 13.2 days during this time.

Next, and as a prelude to the matching analyses, we proceed with a multivariate analysis of the factors available during the admission process that are associated with placement in disciplinary segregation. In the models for men and women, respectively, presented in Table 2, many of the factors are statistically significant and related to placement. Among men and women, those who were younger, Black, mentally ill, or gang-affiliated were more likely to be placed in disciplinary segregation within 3 months of admission. For example, both men and women with a serious mental health diagnosis have an 80% increase in the odds of being placed in disciplinary segregation. Furthermore, inmates who were designated with a higher initial custody level had

Table 2. Logistic Regression of Placement in Disciplinary Segregation in First 3 Months, by Gender.

	Men			Women		
	B	*SE*	*OR*	*B*	*SE*	*OR*
Age	−0.06**	0.002	0.95	−0.06**	0.01	0.94
Black	0.21**	0.03	1.23	1.05**	0.12	2.86
Serious mental illness	0.60**	0.04	1.83	0.59**	0.13	1.80
Gang affiliation	0.35**	0.04	1.41	1.65**	0.42	5.21
Prior incarceration	−0.12	0.04	0.99	0.02	0.15	1.02
Any violent conviction	0.15**	0.04	1.16	0.20	0.17	1.23
Any property conviction	0.06	0.04	1.06	0.15	0.14	1.17
Any drug conviction	−0.20**	0.04	0.82	0.05	0.15	1.05
Most serious felony level[a]						
F1 (Most serious)	−0.03	0.09	0.97	−0.29	0.29	0.75
F2	−0.06	0.09	0.94	−0.01	0.26	0.99
F3	0.001	0.09	1.00	0.13	0.24	1.14
F4	0.04	0.09	1.04	0.12	0.26	1.11
Initial custody level[b]						
Maximum	0.87**	0.26	2.38	—	—	—
Close	0.33**	0.07	1.39	1.23**	0.23	3.43
Medium	0.27**	0.05	1.32	0.10	0.17	1.11
Constant	−0.88**	0.11	0.42	−1.63**	0.35	0.20

Note. Men: Nagelkerke R^2 = .096, χ^2 = 1,993.58, *df* = 15, *p* < .001. Women: Nagelkerke R^2 = .171, χ^2 = 316.84, *df* = 15, *p* < .001. B = exp(b); SE = standard error; OR = odds ratio.
[a]Reference group = *F5 (Least serious)*.
[b]Reference group = *minimum custody*.
*p ≤ .01. **p ≤ .001.

greater odds of being placed in segregation. In both groups, however, neither a previous commitment to the state's custody nor the seriousness of one's felony conviction was statistically associated with placement. The number of group differences found in the table underscores the need for research aimed at understanding why the characteristics of women sent to disciplinary segregation may differ from those of men.

We turn now to the question of whether the experience of disciplinary segregation has a differential effect on institutional misconduct for men and women. Here, we use PSM because this methodology allows for establishing a counterfactual comparison group for the disciplinary segregation inmates for each group.[7] Tables 3 and 4 show the data for men and women, respectively, before and after the matching procedure.[8]

As can be seen in panel A of both tables, the pre-matched groups differed greatly on the covariates examined. After PSM, the men and women groups are much better matched, indicating a substantial reduction in potential bias. Although the matching procedure eliminates all of statistically significant differences for women, there do remain some measures upon which the matched men group still significantly

Table 3. Group Comparisons and Differences in Misconduct Outcomes, Men.

Panel A: Balancing statistics

	Before PSM (AUC = .689)			After PSM (AUC = .507)		
	DS group %/M (SD)	Control %/M (SD)	% STD diff	DS group %/M (SD)	Control %/M (SD)	% STD diff
Age	27.1 (9.1)**	32.7 (10.9)	46.96	27.1 (9.1)	27.4 (9.0)	2.70
Black	53.8**	47.2	13.23	53.8	52.5	2.61
Serious mental illness	36.1**	26.3	21.27	35.8	33.4	5.05
Gang affiliation	32.3**	19.2	30.30	32.3*	36.5	8.85
Prior incarceration	42.6**	50.0	14.88	42.6	45.2	5.24
Any violent conviction	67.3**	57.5	20.34	67.2	67.4	0.43
Any property conviction	45.9	44.9	2.01	46.1	47.2	2.21
Any drug conviction	23.2**	32.2	20.21	23.2	24.1	2.12
Most serious felony level						
F1 (Most serious)	26.5**	20.8	13.44	26.4**	30.7	9.53
F2	27.2	26.2	2.26	27.3*	29.9	5.76
F3	30.7**	33.7	6.42	30.6	28.4	4.83
F4	11.9**	14.0	6.26	11.8**	8.0	12.75
Initial custody level						
Maximum	0.5**	0.2	5.08	0.4	0.6	2.84
Close	22.4**	15.1	18.79	22.1**	26.3	9.82
Medium	59.0**	54.8	8.49	59.2	58.8	0.81

Panel B: Differences in misconduct outcomes

	DS group %	Control %	χ^2 (1)	φ
Pre-matched	(n = 4,968)	(n = 32,341)		
Any subsequent misconduct	60.3	30.7	1,673.49**	.212
Subsequent violent misconduct	31.0	12.9	1,084.53**	.170
Subsequent nonviolent misconduct	53.2	25.0	1,664.51**	.211
Matched	(n = 4,777)	(n = 4,777)		
Any subsequent misconduct	60.7	57.6	9.61**	.032
Subsequent violent misconduct	31.1	27.1	18.50**	.044
Subsequent nonviolent misconduct	53.4	47.3	35.46**	.061

Note. PSM = propensity score matching; AUC = area under the curve statistic; DS = disciplinary segregation; % STD Diff = standardized bias statistic.
*$p \leq .01$. **$p \leq .001$.

differed ($p \leq .01$). It is, however, probable that the larger sample size of matched men ($N = 9,554$) compared to matched women ($N = 692$) had an influence on being able to detect the statistically significant group differences. Nonetheless, it is important to note that the mean standardized percent bias for both groups is substantively reduced post-match. More specifically, the mean percent bias for men is reduced from 15.3 pre-match to 5.0 post-match and for women from 24.4 pre-match to 4.8 post-match. This matching strategy also reduces the AUC values from .689 pre-match to .507 post-match for men, and from .749 pre-match to .504 post-match for women. In total, these comparative analyses indicate the achievement of greater group balance post-match (see Rosenbaum & Rubin, 1985).

Table 4. Group Comparisons and Differences in Misconduct Outcomes, Women.

Panel A: Balancing statistics

	Before PSM (AUC = .749)			After PSM (AUC = .504)		
	DS group %/M (SD)	Control %/M (SD)	% STD Diff	DS group %/M (SD)	Control %/M (SD)	% STD Diff
Age	28.6 (8.8)**	33.6 (9.8)	44.64	29.1 (9.0)	29.0 (8.8)	0.91
Black	51.7**	25.7	55.39	48.8	45.4	6.82
Serious mental illness	72.5**	62.1	22.31	72.5	74.9	5.45
Gang affiliation	3.5**	0.5	21.55	2.0	1.7	2.23
Prior incarceration	28.8	29.1	0.66	29.8	30.1	0.65
Any violent conviction	59.5**	38.0	44.04	57.8	59.5	3.45
Any property conviction	47.7	52.7	10.01	48.6	48.8	0.40
Any drug conviction	25.6**	36.8	24.35	26.6	25.4	2.74
Most serious felony level						
F1 (Most serious)	21.3**	13.3	21.27	22.5	26.3	8.86
F2	27.7	24.0	8.46	26.3	30.3	8.89
F3	30.7	34.5	8.11	31.2	28.9	5.02
F4	13.3	17.1	10.60	12.4	8.7	12.07
Initial custody level						
Close	33.3**	10.1	58.65	29.8	30.3	1.09
Medium	43.2	49.2	12.06	45.4	50.0	9.22

Panel B: Differences in misconduct outcomes

	DS group %	Control %	χ^2 (1)	ϕ
Pre-matched	(n = 375)	(n = 3,296)		
Any subsequent misconduct	56.0	19.5	251.98**	.262
Subsequent violent misconduct	29.1	8.6	148.84**	.201
Subsequent nonviolent misconduct	50.4	15.5	266.44**	.269
Matched	(n = 346)	(n = 346)		
Any subsequent misconduct	53.5	58.1	1.50	−.047
Subsequent violent misconduct	26.9	30.1	0.86	−.035
Subsequent nonviolent misconduct	47.7	50.3	0.47	−.026

Note. PSM = propensity score matching; AUC = area under the curve statistic; DS = disciplinary segregation; % STD diff = standardized bias statistic.
*$p \leq .01$. **$p \leq .001$.

To address the question of whether men and women who experienced disciplinary segregation in the first 3 months of their incarceration were more likely to engage in institutional misconduct in the following 9 months, we conducted chi-square tests to assess group differences in the outcomes. We also calculated phi to determine the magnitude of these relationships. Panel B in the tables summarize the findings for the men and women, respectively.

Pre-match analyses show that men and women in the disciplinary segregation group were significantly more likely than their unmatched peers to engage in all three types of institutional misconduct examined here: any misconduct, violent misconduct, and nonviolent misconduct ($p \leq .001$). The magnitude of these relationships ranges from $\phi = .17$ to .27, which would be considered a moderate level of association.

The post-match analyses indicate that even after adjusting for potential confounding, a stay in disciplinary segregation is associated with misconduct among men; among women, it eliminates any difference. Specifically, for men, the experience of disciplinary segregation is still found to significantly increase one's probability for engaging in all three outcome measures; however, the magnitude of these relationships is largely diminished (ϕ = .03 to .06). These findings would be considered "small" by Cohen's (1988) guidelines. The post-match analyses for the women inmates indicate that there is no statistically significant difference in the outcomes between those who experienced disciplinary segregation and those who did not. Given the minor imbalance on some of the post-match characteristics for men, we undertook a series of additional regression analyses to assess the impact of disciplinary segregation on the institutional misconduct measures; these analyses included as controls any covariates for which imbalance remained after matching (see Table 5). Even after including these covariates, these analyses indicate that the experience of disciplinary segregation has a statistically significant and positive effect on the three misconduct outcomes for men.

Discussion

Restrictive housing has been a lightning rod for controversy. According to scholars, proponents of the practice contend that this setting dissuades inmates from engaging in any further criminal activity (see Labrecque & Mears, 2019; Mears & Bales, 2009). Its critics, however, disagree, arguing instead that the harsh conditions and idleness of time spent in segregation lead to serious mental health problems and also increase antisocial behavior (Haney, 2003; Shalev, 2009; Toch, 2003). Against this backdrop have been many calls for more empirical research on this type of housing to help advance the understanding of its effects (e.g., Frost & Monteiro, 2016; Mears, 2016). This study responds to these calls both by examining the impact of disciplinary segregation on inmate misconduct and by examining gender differences in its effect. Drawing on prior work, we hypothesized that disciplinary segregation would increase misconduct and that this effect would be more pronounced for men than for women.

Results of the study reveal that the experience of disciplinary segregation did not reduce the likelihood of engaging in institutional misconduct upon return to the general prison population. This finding supports the conclusions of two recent disciplinary segregation evaluations (Lucas & Jones, 2019; Morris, 2016). That is, there appears to be a positive association between disciplinary segregation and inmate misconduct, at least among men; this pattern is consistent with what one would expect from Broidy and Agnew's (1997) gender and GST and Blevins et al.'s (2010) general strain perspective on institutional adjustment in prison (see also Listwan et al., 2013; Morris et al., 2012).[9] However, the magnitude of this relationship was small. Also, contrary to what we hypothesized, after addressing potential confounding, there was no effect of segregation on misconduct among women. We anticipated that the experience of segregation would have some effect on women inmates. Perhaps, though,

Table 5. Logistic Regression of Institutional Misconduct Measures for Men With Imbalanced Covariates.

	Any misconduct			Any violent misconduct			Any nonviolent misconduct		
	B	SE	OR	B	SE	OR	B	SE	OR
DS placement	0.14**	0.04	1.15	0.23**	0.05	1.25	0.25**	0.04	1.29
Gang affiliation	0.48**	0.05	1.62	0.56**	0.05	1.76	0.45**	0.04	1.56
Most serious felony: *F1*	−0.11	0.06	0.90	0.19*	0.07	1.21	−0.21**	0.06	0.81
Most serious felony: *F2*	0.06	0.05	1.06	0.20**	0.06	1.22	−0.04	0.05	0.97
Most serious felony: *F4*	0.23*	0.08	1.25	0.21*	0.08	1.23	0.18	0.08	1.19
Initial custody level: *close*	0.07	0.06	1.07	−0.03	0.06	0.98	0.11	0.06	1.11
Constant	0.11	0.05	1.12	−1.34**	0.05	0.26	−0.24**	0.05	0.79

Note. Any misconduct: Nagelkerke R^2 = .020, χ^2 = 143.36, *df* = 6, *p* ≤ .001. Any violent misconduct: Nagelkerke R^2 = .027, χ^2 = 180.81, *df* = 6, *p* ≤ .001. Any nonviolent misconduct: Nagelkerke R^2 = .023, χ^2 = 165.56, *df* = 6, *p* ≤ .001. B = exp(b); SE = standard error; OR = odds ratio; DS = disciplinary segregation.
*p ≤ .01. **p ≤ .001.

segregation exerts effects on women in other ways, such as influencing their mental health, perceptions of officer legitimacy, and ability to participate in rehabilitative or educational programming.

As with any study relying on administrative data, caution should be exercised in interpreting these results. The data are limited to what is collected by the department for other internal purposes, which precluded us from gathering other potentially important variables (e.g., strains, coping strategies, participation in treatment or educational services, visits, and other communications from the outside). Also, the use of PSM cannot account for unmeasured confounding variables, such as visitation and programming. In addition, our reliance on formal infractions as an outcome variable carries certain risks, such as not all rule violations may be detected or officially processed. We believe, however, that the benefits of analyzing this type of data far outweigh the limitations that may exist. Nevertheless, confidence in the results will emerge only with additional studies in other jurisdictions that examine the effect of disciplinary segregation on inmate misconduct as well as studies that examine the extent to which identified effects vary among men inmates and women inmates, respectively. Given policy differences in admission criteria, conditions of confinement, and length of stay restrictions across correctional agencies (see, for example, Metcalf et al., 2013), more research is also needed to assess if the findings in this state system generalize to other jurisdictions or extend to other forms of restrictive housing (e.g., administrative segregation, protective custody) and longer periods of follow-up. In addition, the analyses focused only on disciplinary segregation during the initial months of incarceration. There is little basis for anticipating that the effects are different at later stages of incarceration, but additional research is needed that investigates that possibility.

It is also important to note that the inmates in our study served time in disciplinary segregation between 2007 and 2011. It is possible that changes in policy and practice over the last decade may have resulted in differences in the effectiveness of disciplinary segregation to influence inmate behavior. This possibility highlights the need for continued research in this area with more current data, as well as for investigators to assess how other situational variables, such as the institutional culture and reason for placement, may influence the impact of this practice on inmate outcomes (Gendreau & Labrecque, 2018). For example, institutions with higher levels of cultural punitiveness may not only rely on segregation more often but may also more strictly enforce institutional rules and regulations. In addition, inmates who are treated poorly by staff in segregation may be more likely to violate the institutional rules post-release than those who are treated with more dignity and respect. The impact of this setting may also be less influential when someone serves time for a minor offense rather than for one that is more serious, or when someone prefers placement in segregation over housing in the general prison population. Finally, correctional officers have a great deal of discretion in choosing which inmates and rule infractions to formally write-up (Cochran et al., 2018). Because these write-ups serve the basis for placement in disciplinary segregation, more research is needed that illuminates how officers make decisions related to the enforcement of institutional rules and in turn the effects of decisions to impose disciplinary segregation (see also Butler & Steiner, 2017; Logan et al., 2017). This issue is especially important to address in future research on this topic because there is good reason to suspect that officers may enforce institutional rules differently in men and women prisons and further that staff may treat men and women differently following a stay in disciplinary segregation.

Going forward, research is needed, too, that tests the specific mediating pathways through which disciplinary segregation may influence inmate behavior. GST offers one basis for anticipating that segregation may result in misconduct among men, but not women. Among other things, women may experience the strain of segregation differently and they may adapt to it differently. We were not able to test the mechanisms specified by GST, only the end result. Nonetheless, we believe that GST is especially well suited to explain the impact of disciplinary segregation on inmate behavior. A logical next step given the study's findings is to examine whether this setting affects misconduct through increased strain, and whether, among women inmates, this housing increases strain that in turn results not in misconduct but an adverse influence on emotional or mental health (see, generally, Dobash, Dobash, & Gutteridge, 1986; Garcia, 2016). Research ideally will explore other factors that may contribute to gender differences in responses to segregation, such as the influence of biology, socialization, and variation in how women and men in prison are treated. These factors warrant investigation as do other potential theoretical perspectives, including deterrence theory and defiance theory (see e.g., Gendreau & Labrecque, 2018; Morris, 2016), that may illuminate the effects of segregation.

If, as this study suggests, disciplinary segregation does not decrease, and may even increase, institutional misconduct, then its continued use may constitute an inefficient

use of scarce resources. It is, of course, possible that disciplinary segregation may produce benefits for entire systems, even if, or when they also create harms for individual inmates who are subject to the housing. There is, however, limited empirical evidence to date that supports this claim (Briggs, Sundt, & Castellano, 2003; Huebner, 2003; Wooldredge & Steiner, 2015). At the same time, alternative approaches to sanctioning inmates and to improving their behavior exist (see, for example, Gendreau, Goggin, Cullen, & Andrews, 2000; Pratt, Cullen, Blevins, Daigle, & Madensen, 2006). Accordingly, it may be that investing in such approaches rather than disciplinary segregation may more effectively improve order and safety in prisons (Labrecque & Smith, 2019b). To the extent that disciplinary segregation is used, policymakers and corrections officials should take steps to reduce the strains associated with the housing and to assist inmates in developing prosocial coping strategies during and after release from it. Finally, correctional authorities and scholars should continue to monitor the use of disciplinary segregation and assess whether the setting improves or worsens behavior among men and women inmates.

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Notes

1. Approximately 6% of the total population of inmates admitted into custody during the sampling time frame were excluded based on our inclusion criteria. For comparative purposes, the demographic profile of the total sample is 9% women, 48% Black, with a mean age of 30 years old, and the profile of the included sample is 9% women, 46% Black, with a mean age of 32.
2. As a supplemental analysis, we also conducted propensity score modeling (PSM) analyses with a measure of any institutional misconduct during the first 3 months entered as a matching variable. Given the high percentage of placement in segregation following institutional misbehavior, this approach only identified comparable matches for 65% of the men in disciplinary segregation and 31% of the women in disciplinary

segregation. The results of this analyses, nonetheless, are similar to those presented here. We thank one of the anonymous reviewers for recommending this analysis as a robustness check.

3. In this state, correctional officers and other staff members can write up an inmate for violating the institutional rules and a hearing is conducted to determine the facts in the case. At the hearing, evidence is presented against the accused and he or she can either plead guilty to the offense or plead not guilty and defend himself or herself against the charges (e.g., call witnesses on his or her behalf). If the inmate is found guilty by the rule infraction board, a range of sanctions may be imposed, including the removal of specific privileges, loss of good time, or a sentence for a specific length of time in disciplinary segregation. The type and severity of the specific sanction is contingent upon the nature of the misconduct. Departmental regulations limit the amount of time an inmate may serve in disciplinary segregation for a single offense to 15 days; however, if the inmate has been charged with multiple violations, or if he or she accrues new violations while in segregation, their length of stay can be extended up to 30 days.

4. Supplemental analyses using 2-, 4-, and 6-month durations were undertaken; no appreciable differences in the statistical or substantive significance of the findings presented here emerged.

5. The Department of Corrections in this study also has a classification rating of *supermax*, which is the most intensive custody level. However, this study excluded long-term segregation inmates; thus, there are no inmates included who were classified as supermax custody during intake.

6. We also conducted PSM analyses using a less stringent .05 caliper setting. Although this strategy increased the matched sample size for both the men and women samples, it also created greater dissimilarities between the groups on a number of covariates. As a result, we opted to retain the more rigorous matching approach (i.e., one-to-one with .01 tolerance level) in this study. It should be noted that no appreciable differences in the statistical or substantive significance of the findings emerged between these two strategies.

7. As an ancillary analysis, we also tested for an interaction effect (disciplinary segregation $\times$ gender) using logistic regression to predict any misconduct, violent misconduct, and nonviolent misconduct while controlling for other independent variables. The interaction term was statistically significant in all three models ($p \leq .001$); the findings indicate that men in segregation were more likely to engage in all three categories of institutional misconduct.

8. Because inmates are transferred across and between facilities frequently, we chose not to rely on a multilevel analysis in this study. We did, however, conduct ancillary PSM analyses that included the initial facility placement as a matching variable. Specifically, we created dummy variables for each facility, which included 30 men facilities and five women facilities. The findings were similar to those shown here.

9. Although not the focus of this study, this finding is also consistent with the predictions of the importation and deprivation perspectives.

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