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## PRISON OFFICER LEGITIMACY, THEIR EXERCISE OF POWER, AND INMATE RULE BREAKING\*

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KEYWORDS: inmates, prisons, rule breaking, legitimacy, power

*Prison officers are directly responsible for transmitting penal culture and prison policy to the confined, yet few studies of officers' impact on inmate behavior have been conducted. We examined the effect of inmates' perceptions of officer legitimacy on rule breaking within prisons, as well as the effects of officers' reliance on different power bases on rates of rule breaking across prisons. The findings from bi-level analyses of data from inmates and officers from 33 prisons revealed that inmates who held stronger views regarding officer legitimacy committed fewer nonviolent infractions but that perceived legitimacy did not affect the number of violent offenses inmates committed. We also examined a subsample of inmates encountered by officers for a rule violation and found no relationship between perceived legitimacy and subsequent rule breaking, although stronger perceptions of procedural justice related to the incident did directly and indirectly (through perceived legitimacy) coincide with lower odds of nonviolent misconduct. At the prison level, we found that prisons in which officers exercised their authority more lawfully and fairly (positional power) or by relying more on their skills and expertise (expert power) had lower rates of violent or nonviolent rule violations. Prisons in which officers relied more on coercion had higher levels of nonviolent infractions.*

Deviations from the formal rules of conduct in a prison include behaviors considered crimes if committed by the general population (e.g., assaults) and acts that interfere with the daily prison routine (e.g., disrespecting an officer; DiIulio, 1987; Eichenthal and

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Jacobs, 1991; Wooldredge, 1994). The smooth operation of the daily routine is synonymous with “good order” in a prison; rule violations are disruptive to both the safety and the social order of penal institutions (Bottoms, 1999; DiIulio, 1987; Irwin, 1980). Inmates who violate prison rules also have higher odds of recidivism after their release (Cochran, 2013; Cochran et al., 2014; Huebner, DeJong, and Cobbina, 2010; Ostermann, 2011), and so understanding the sources of offending in prison is relevant to both institutional and public safety.

Empirical and practical interests in the causes and correlates of inmate rule breaking have generated numerous studies on the subject. The findings from these studies have underscored the relevance of inmate characteristics (e.g., age), features of prison environments (e.g., crowding), and management practices (e.g., use of disciplinary housing) for predicting rule breaking (Bottoms, 1999; Steiner, Butler, and Ellison, 2014). Few scholars have considered the potential influence of prison officers, and Stichman and Gordon (2015) noted the contradiction in ignoring officer factors in related research (especially regarding inmate threats to safety, as they examined) given their vital role in managing prisoner populations. This gap in the literature is striking because prison officers are responsible for directly transmitting prison policy and penal culture to the confined (Garland, 1990; Lipsky, 1980; Vuolo and Kruttschnitt, 2008). How officers exercise their power over inmates can influence inmates’ perceptions regarding the legitimacy of their authority, not to mention regarding the legitimacy of prison rules (Bottoms, 1999; DiIulio, 1987; Hepburn, 1985; Lombardo, 1989; Wooldredge and Steiner, 2016). Differences in how prison officers exert their power and perceptions of their legitimacy may influence inmates’ willingness to comply with prison rules, which ultimately affects prison order (Bottoms, 1999; Hepburn, 1985; Sparks, Bottoms, and Hay, 1996).

Despite the theoretical connections between the actions of prison officers and inmate behavior, researchers have not empirically assessed these ideas. Using data on inmates and officers from 33 prisons across Ohio, we examine the effect of inmates’ perceptions of officer legitimacy on rule breaking within prisons, as well as the effects of officers’ reliance on different power bases on rates of rule breaking across prisons.

## PRISON OFFICER LEGITIMACY AND INMATE RULE BREAKING

Themes that have emerged from research on inmate deviance include significant differences in rates of rule breaking across prisons and the relevance of management practices for explaining these differences (Bottoms, 1999; Camp et al., 2003; DiIulio, 1987; see also Useem and Kimball, 1989, for their organizational perspective on prison riots). Prison administrators develop these practices and related policies, but prison officers translate them into action (Garland, 1990; Liebling, Price, and Shefer, 2011; Lipsky, 1980; Lombardo, 1989). As a result of their legal authority, prison officers are the visible representation of the formal rules of conduct and, for the most part, determine how the rules are enforced (Liebling, Price, and Shefer, 2011; Lombardo, 1989; Sparks, Bottoms, and Hay, 1996; Vuolo and Kruttschnitt, 2008). Officers’ treatment of inmates during their routine encounters related to rule violations could influence inmates’ perceptions regarding the legitimacy of rules and the officers’ authority (Bottoms, 1999; Hepburn, 1985; Irwin, 1980; Liebling, 2004; Lombardo, 1989; Sparks, Bottoms, and Hay, 1996; Steiner and Wooldredge, 2015).

Legitimate authorities are those who are in a lawful position to influence others, generally act fairly, and can justify their actions to those affected by their decisions (Bottoms and Tankebe, 2012; Liebling, 2004; Tyler, 1990). When people believe that authorities are legitimate, they are more likely to accept and comply with the decisions of those authorities, regardless of their self-interests, because they are more likely to buy into those decisions (Franke, Bierie, and MacKenzie, 2010; Tyler, 1990, 2003). Inmates who hold stronger beliefs regarding the legitimacy of prison officers may be more likely to comply with the rules because officers typically decide how the rules are enforced (Bottoms, 1990; Garland, 1990; Liebling, Price, and Shefer, 2011; Lombardo, 1989; Sparks, Bottoms, and Hay, 1996; Tyler, 2010).

Scholars have differed in their conceptualization of legitimacy (e.g., Franke, Bierie, and MacKenzie, 2010; Tankebe, 2013; Tyler, 1990, 2003). Most of this discussion has centered on whether an individual's perceived obligation to obey authorities is distinct from his or her perceptions of the legitimacy of those authorities (Tankebe, 2013). Here, we follow from Tankebe (2013) who observed that the obligation to obey authorities could be distinct from their "legitimacy." This is to say that individuals may obey authorities for reasons other than their perception of authorities as legitimate. Individuals in prison, for example, may feel obligated to obey authorities and the rules they enforce because of fear, a sense of powerlessness, or pragmatic acquiescence (Carrabine, 2005; Tankebe, 2013); these feelings should not be construed as "legitimacy." Prison officer legitimacy involves legal authority assigned by the state in addition to inmates' general perceptions of officers' effectiveness and fairness (Bottoms and Tankebe, 2012; Tankebe, 2013). This definition of officer legitimacy was adopted for the study.

Prison officer legitimacy is derived from the structural position of their legal authority (French and Raven, 1959; Hepburn, 1985; Tyler, 1990; Weber, 1968), and from prisoners' perceptions of the distributive and procedural justice they have received during their encounters with officers (Franke, Bierie, and MacKenzie, 2010; Henderson et al., 2010; Reisig and Mesko, 2009; Sparks, Bottoms, and Hay, 1996; Steiner and Wooldredge, 2015; Tyler, 2010).<sup>1</sup> In ethnographic studies of prison officers and prison environments, researchers have underscored the relevance of inmates' perceptions regarding officer legitimacy for order maintenance (e.g., Clemmer, 1940; Irwin, 1980; Liebling and Price, 1999; Sparks, Bottoms, and Hay, 1996). For instance, Sparks, Bottoms, and Hay (1996) compared the environments of two maximum-security prisons in the United Kingdom. They found that the prison in which staff were less coercive and more fair with inmates had fewer problems (e.g., riots and violence) and better order. In her study of five prisons in the United Kingdom, Liebling (2004) uncovered that inmates' perceptions of facility order were influenced by their beliefs regarding the fairness or legitimacy of staff as well as by the quality of the relationships between staff and inmates. Evidence derived from studies of citizens' perceptions of the police and courts also supports the relationship between legitimacy and compliance (e.g., Mazerolle et al., 2013a, 2013b; Nagin and Telep,

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1. Distributive justice refers to individuals' perceptions concerning the fairness of the outcomes they received during their encounters with legal authorities. Procedural justice involves individuals' perceptions regarding the specific procedures used by legal authorities to arrive at those outcomes. In particular, individuals typically desire to have a voice and participate in the decision-making process. They expect authorities to remain neutral and treat them with dignity and respect. Individuals also want to believe that authorities are acting out of a desire to do what is right, that they can morally justify their decisions (Bottoms, 1999; Sparks, Bottoms, and Hay, 1996; Tyler, 1990, 2010).

2017; Paternoster et al., 1997; Tyler, 1990). To date, however, few quantitative studies have been aimed at examining the influence of inmates' perceptions regarding the legitimacy of prison staff on inmate rule breaking.

In a study of inmates housed in a Slovenian prison, Reisig and Mesko (2009) examined the effects of inmates' perceptions of the legitimacy and procedural justice of the staff on inmate rule violations. They found that procedural justice was inversely related to rule breaking, whereas legitimacy was not related to violations. Beuersbergen and colleagues (2015) also found that procedural justice was inversely related to rule breaking among a sample of Dutch prisoners. Regardless, the limited research devoted to the procedural justice-legitimacy-rule breaking relationship in prisons, the absence of research regarding this relationship among prisoners incarcerated in the United States, and the nuances associated with measuring legitimacy, call for additional investigation of the topic.

## PRISON OFFICERS' EXERCISE OF POWER AND INMATE RULE BREAKING

The previous discussion focused on power recipients' (inmates') beliefs regarding the legitimacy of power holders (prison officers), how legitimacy is shaped during specific encounters between inmates and officers, and the effect of inmates' perceptions of officers on subsequent rule breaking. Also relevant to consider, however, is how officers exercise their authority in general. How power holders exercise their power in general influences whether they maintain legitimacy and ultimately compliance (Bottoms and Tankebe, 2012; Stichman and Gordon, 2015; Wooldredge and Steiner, 2016). An understanding of the "dialogic nature" of the legitimacy-compliance relationship requires consideration of how power recipients perceive power holders in conjunction with how power holders behave (Bottoms and Tankebe, 2012). In a prison context, for instance, officers who tend to rely on coercion to achieve inmate compliance may weaken the legitimacy of the officer workforce with the inmate population, ultimately amplifying inmate rule breaking. Officers who use their expertise for problem solving or who capitalize on the respect they have cultivated over time to gain compliance may reinforce their legitimacy and promote adherence to the rules (Irwin, 1980; Stichman and Gordon, 2015; Wooldredge and Steiner, 2016).

Consideration of how prison officers typically exercise their power is consistent with Bottoms and Tankebe's (2012) call for examinations of power-holder legitimacy. Such an examination also illuminates the "rightness" of the power-holder-power-recipient relationship in prisons. Right relationships are those that involve mutual respect between officers and inmates but also uphold the norms of society (Bottoms and Tankebe, 2012; Liebling, 1994; Sparks, Bottoms, and Hay, 1996). To understand the impact of prison officers' behaviors in general on inmate rule breaking, we examined officers' perceptions of their own exercise of power among inmates.

The exercise of power involves one person's ability to influence the behavior of another (French and Raven, 1959; Hepburn, 1985; Stichman and Gordon, 2015). The basis of power refers to the relationship between the power holder and the power recipient that is the source of the power (French and Raven, 1959). Hepburn (1985) observed that the base of power is relevant to understanding how criminal justice actors exercise their power. Drawing from French and Raven (1959), Hepburn identified five social bases of power among prison officers: 1) legitimate, 2) referent, 3) expert, 4) reward, and 5) coercive.

*Legitimate (positional) power* derives from prison officers' structural position of authority within the prison bureaucracy (French and Raven, 1959; Gordon and Stichman, 2016; Hepburn, 1985), but officers who abuse their power or use it arbitrarily may undermine their right to govern (Bottoms and Tankebe, 2012; French and Raven, 1959; Sparks, Bottoms, and Hay, 1996). The legitimate exercise of authority requires lawfulness and fairness (Bottoms and Tankebe, 2012; Tankebe, 2013), and we expect that prisons with officers who rely more heavily on legitimate power will have lower rates of rule breaking. In their individual-level analysis of officers' fear of harm and perceived safety risk, Stichman and Gordon (2015) found that fear of harm was lower among officers who believed inmates respected the "position" of a correctional officer. This might extrapolate to the aggregate level in terms of higher levels of inmate compliance in prisons with greater proportions of officers who rely on legitimate power. Considering the earlier discussion pertaining to legitimate authority, the use of legitimate power in prison likely depends (at least in part) on inmates' beliefs regarding the legitimacy of officers' authority. To avoid confusion pertaining to the discussion of the link between prison officers' exercise of power, officer legitimacy, and rule breaking, we use the term "positional power" in place of legitimate power.

*Referent power* refers to when inmates comply with officers and rules out of respect or admiration for officers (French and Raven, 1959; Gordon and Stichman, 2016; Hepburn, 1985). The coercive nature of the confinement experience makes referent power difficult for prison officers to achieve (Hepburn, 1985). Researchers, however, have found that officers who treat inmates fairly and with respect tend to garner respect (Liebling, 2004; Liebling, Price, and Shefer, 2011). As opposed to other types of power, referent power might also generate compliance without an officer's presence because inmates might refrain from rule breaking if they value an officer's opinion of them (Wooldredge and Steiner, 2016). Inmates likely hold a more positive view of their institution when officers mobilize referent power more frequently, and so these prisons may have less rule breaking.

Prison officers who use special skills or knowledge to gain compliance invoke *expert power* (French and Raven, 1959; Gordon and Stichman, 2016; Hepburn, 1985). Such skills or expertise might include helping inmates to solve problems, resolve their differences, or simply adapt to an incarcerative setting. Inmates appreciate officers who use their skills to assist them rather than to obstruct their ability to do their time (Liebling, 2004; Liebling, Price, and Shefer, 2011; Lombardo, 1989). Inmates may comply with officers who rely on expert power because they have trust or confidence that those officers know what is in their best interest. Stichman and Gordon (2015), in their individual-level study of officer fear and safety risk, revealed that officers who believed their ability to resolve disruptive situations in prison contributed to greater control over inmates were less likely to fear being harmed by inmates and perceived lower safety risks. This finding raises the possibility of a prison-level effect of the general use of expert power among officers on levels of inmate compliance with the rules.

Prison officers exercise *reward power* when inmates believe that the officer is both capable and willing to issue special benefits or privileges to them in exchange for compliance (French and Raven, 1959; Hepburn, 1985). Formal rewards are limited in a prison context, but officers can dispense informal rewards. Sykes (1958) described a norm of reciprocity where, for example, officers overlooked an inmate's minor rule violations in exchange for the inmate's compliance with major rules or assistance controlling other inmates (see also

Lombardo, 1989; McCleary, 1961). Officers can also affect inmates' housing and work assignments or, in some states, their date of release (by affecting their good time or earned time; Hepburn, 1985). These informal practices are used to maintain order in prison, but the strategy is not considered effective in the long term (Hepburn, 1985; Wooldredge and Steiner, 2016). Moreover, the use of rewards to control some inmates versus others fuels inmate perceptions regarding arbitrary treatment, injustice, and illegitimate use of authority by officers, each of which has been linked to inmate rule breaking (Colvin, 1992; Kauffman, 1988; Useem and Kimball, 1989). We expect prisons with officers who rely more heavily on reward power will have higher levels of rule breaking.

Officers use *coercive power* when they punish or threaten to punish noncompliance (French and Raven, 1959; Hepburn, 1985). Examples of formal means of discipline in a prison include room restrictions, extra duty, loss of privileges, and segregation, whereas informal discipline might include failure to protect inmates from other inmates, interfering with inmates' daily routines (e.g., not opening their door on time), and threats of (or actual) physical harm. The use of coercion is inevitable within a prison, but an overreliance on coercion to maintain order is untenable because officers have limited sanctions at their disposal, and because an overreliance on coercion can weaken inmates' beliefs regarding the legitimacy of officers' authority (Bottoms and Tankebe, 2012; Hepburn, 1985; Sparks, Bottom, and Hay, 1996; Wooldredge and Steiner, 2016). For these reasons, we expect prisons with proportionately more officers who invoke coercive power will have higher rates of rule breaking.

The preceding discussion underscores that prison officers' use of power in general influences whether they maintain legitimacy and inmate compliance. An officer's "base of power" reflects how he or she exercises his or her power in a prison (Hepburn, 1985). Officers' use of positional, referent, and expert power is consistent with promoting fairness, mutual respect, and preserving inmates' dignity, all of which promote more legitimate prison regimes and have been associated with more orderly institutions (Liebling, 2004; Sparks, Bottoms, and Hay, 1996; Tyler, 2010). Officers' use of reward power and coercive power, in contrast, indicates officers are unwilling or unable to rely on their expertise, respect garnered from inmates, or their structural position in the prison bureaucracy to gain compliance (Wooldredge and Steiner, 2016). Use of rewards to gain compliance is also not sustainable because inmates come to expect such rewards; officers who use reward power risk that inmates will only comply in exchange of said rewards (Hepburn, 1985; Sykes, 1958). An overreliance on coercion or force can promote defiance and resistance among inmates (Kauffman, 1988). We expect that prisons with officers who use positional, referent, or expert power more frequently will have less rule breaking, whereas rule breaking will be more frequent in prisons with officers who rely more on reward or coercive power.

## OTHER POSSIBLE INMATE AND PRISON-LEVEL INFLUENCES ON RULE BREAKING

Analysis of the effects of prison officer legitimacy and officers' exercise of power on inmate rule breaking requires consideration of relevant covariates that might be included in a multivariate model as statistical controls. Based on the extant evidence, inmate-level covariates include 1) demographic characteristics (age, sex, race/ethnicity), 2) involvement in behaviors reflective of social integration prior to incarceration (marriage, education,

employment), 3) a history of involvement in unconventional pursuits (e.g., gangs) or behaviors conceptually similar to rule breaking (e.g., drug use and prior criminality), and 4) routines during incarceration (education classes, work assignment, recreation, experiencing victimization; for related studies, see Camp et al., 2003; Cunningham and Sorensen, 2006; Griffin and Hepburn, 2006; Harer and Steffensmeier, 1996; Kruttschnitt and Gartner, 2005; Sorensen and Cunningham, 2010; Steiner and Wooldredge, 2009a, 2009b, 2015; Wooldredge, 1994; Wooldredge, Griffin, and Pratt, 2001).

Prison characteristics that may be relevant include 1) architectural design (linear design with celled housing, linear design with dormitory housing, campus design with celled housing, campus design with dormitory housing), 2) security level ( $\geq$  maximum security,  $\geq$  close security, medium security, minimum security), 3) population and size (population, design capacity, ratio of population to design capacity, average number of inmate per housing unit), 4) inmate population composition (inmate racial heterogeneity, average custody level), 5) level of supervision (ratio of correctional officers to inmates), and 6) staff population composition (staff racial heterogeneity; e.g., Griffin and Hepburn, 2006; Huebner, 2003; Irwin, 2005; Steiner and Wooldredge, 2008, 2009b; Wooldredge and Steiner, 2009). Measures reflecting these inmate- and prison-level concepts have often been examined by researchers, although the significance of the relationships between some of these variables and rule breaking have varied across studies based on factors such as how the concepts were measured, the type of rule violations examined, and the populations or related sample sizes under study (Steiner, Butler, and Ellison, 2014).

## METHOD

This study involves an examination of 1) the effect of the legitimacy of prison officers (as perceived by inmates) on subsequent inmate rule breaking, 2) the relative effects of officers' power bases on prisons' *rates* of rule breaking, and 3) the direct and indirect (through officer legitimacy) effects of procedural and distributive justice on subsequent rule breaking. The data for the study were collected as part of a larger project designed to evaluate the inmate disciplinary processes within Ohio prisons. The project involved collecting survey data from inmates regarding their backgrounds, prison routines, perceptions of the staff, and so forth. Official data on inmates' criminal histories, gang affiliations, (social) demographics, and rule violations committed during the 6 months after the survey was administered were also collected. We also surveyed officers regarding their backgrounds and the disciplinary procedures and social climate of their prison. The target populations for this study included all of the long-term inmates (those who had served  $\geq$  6 months in state custody) and all line-level correctional officers from the 33 prisons in Ohio; these 33 prisons constituted all Ohio prisons housing adults at the time of the study.

### INMATE SAMPLES AND SURVEY DATA

The inmate data used here comprise a representative probability sample of 3,886 inmates housed in the 33 Ohio prisons who had served at least 6 months in state custody. Inmates who had served less than 6 months were excluded from the study because the survey was focused, in part, on inmates' experiences during the 6-month period prior to their survey date. Based on the aims of the larger project, we sampled either 130 or 260 inmates from each prison (the bigger samples were surveyed twice over the course of the



larger project). Shortly before our visit to each prison, an administrative assistant to the warden provided a Microsoft® EXCEL™ file of all inmates housed within the prison plus supplemental information on each inmate (admission date, security status, housing unit, etc.). We deleted all persons who would not have yet served 6 months by the day of our visit. Each frame was then stratified by whether inmates had previously served prison time to capture the experiences of both first-time inmates and those who had previously served time. Next, equal numbers of inmates were selected from each stratum using simple random sampling with IBM® SPSS™. These procedures resulted in a total sample size of 5,094 inmates across all 33 prisons. Some inmates were not available on the day of the survey, which reduced the total sample size to 4,930 inmates. To adjust for the differences in the odds of selecting inmates based on strata and between-prison differences in inmate population size, sample weights were created that reflected the inverse of each inmate's odds of selection. These weights were normalized and applied to the analyses reported here.

The methods of administering the survey varied to some degree across facilities, but these differences did not impact participation rates. For most facilities, inmates were surveyed in groups that differed in size based on the custody level of each prison or the unit within a multisecurity prison, while ensuring enough physical separation between inmates to prevent interactions between them. Inmates in restrictive housing were surveyed in their cells or housing areas. After briefly describing the study, a member of the research team gave each inmate a survey and a voluntary consent form. Each survey was subsequently collected by one of the researchers. Inmates were not compensated for their participation in the study. These procedures resulted in a sample size of 3,976 inmates. Some surveys ( $n = 90$ ) were later determined to be unusable because of missing data. These surveys were discarded, reducing the sample size to 3,886 inmates (a 79 percent participation rate). Comparisons between the weighted sample and the population of inmates who had served at least 6 months in state custody revealed no significant differences with respect to age, sex, race, committing offense type, prior incarceration, sentence length, and time served (all available parameters were provided by the Ohio Department of Rehabilitation and Correction).

All 3,886 inmates were followed for any rule infractions committed during the 6-month period after their survey date. We also examined a subsample of inmates; those who reported an encounter with prison staff regarding a rule violation during the 6 months prior to the survey ( $n = 1,295$ ). This permitted analysis of whether inmates' perceptions of the treatment they received during their encounters with officers regarding rule violations influenced these inmates' odds of subsequent rule breaking.

## OFFICER SAMPLES AND SURVEY DATA

The officer sample is a probability sample of 1,382 officers working in the same 33 prisons. A systematic random sample of officers was selected from each facility using lists of all line officers and sergeants provided by the wardens' offices. Sample sizes were determined using probabilities proportionate to size, with the goal of 95 percent confidence intervals for parameter estimates. We also included an oversample of 50 percent in anticipation of refusals and incomplete surveys based on prior research on prison officers (e.g., Hepburn, 1985). These procedures resulted in a 36 percent sample of the entire officer population in Ohio at the time of the study, a target sample size of 2,893 officers. Some

officers were transferred, fired, placed on leave, or resigned prior to each visit, which reduced the usable target sample size to 2,758 officers.

An envelope containing a survey, a letter explaining the study (and voluntary consent to participate), and a postage paid return envelope was placed in each officer's mail at each prison. Two waves of follow-up surveys were distributed to nonrespondents (at 3 and 7 weeks after the first distribution). These procedures resulted in the return of 1,394 surveys (a 50 percent response rate). Missing data on the measures reduced the sample used here to 1,382. All cases were weighted inversely to their odds of selection into the sample, with weights normalized prior to analyses. The weighted sample was representative in terms of sex, race/ethnicity, rank, and length of service, although the sample was slightly older than the target population ( $\bar{x} = 42.4$  vs.  $\mu = 41.3$ ). We used the data collected from officers to create the measures pertaining to officers' power bases (described in the next section).

## MEASURES

Table 1 provides all measures for the analyses. The outcome measures included the number of violent and nonviolent offenses inmates were found guilty of during the 6 months *after* the survey date.<sup>2</sup> Violent offenses include infractions such as threatening, causing physical harm, or attempting to cause physical harm to an inmate or staff member. Nonviolent offenses include all other offenses except drug and alcohol offenses.<sup>3</sup> The outcome measures used here were derived from official data stored in the Ohio Department of Rehabilitation and Correction computer database. Official measures of rule violations likely underestimate the total volume of deviance within institutions (Hewitt, Poole, and Regoli, 1984). Official measures of rule violations may also be subject to systematic bias resulting from discretionary reporting or recording on the part of the staff (Light, 1990). Although official measures of rule violations have been determined to be valid indicators of inmate behavior (Steiner and Wooldredge, 2014; Van Voorhis, 1994), the limitations of these measures should be kept in mind when interpreting the findings.

Four survey items capturing our definition of *prison officer legitimacy*, the inmate level measure of interest, were examined with a confirmatory factor analysis (CFA) to see whether they could be combined into a single latent variable. These four items ( $\alpha = .75$ ) assessed inmates' general perceptions regarding the effectiveness and fairness of the officers (e.g., "overall, the officers here do a good job"; see table 1). Other inmate-level measures included in the analyses were *age*, sex (*male*), race (*African American*, *other*

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2. We also examined prevalence measures of violent and nonviolent rule violations, but we do not present the results of those analyses because they were substantively similar to those for the incidence measures (described subsequently). The mean prevalence of nonviolent infractions during the 6-month period was .43 ( $s = .50$ ), and the mean prevalence of violent offenses was .06 ( $s = .24$ ).
  3. Drug and alcohol offenses were excluded from the nonviolent offense group because of a preference to treat drug and alcohol offenses as a separate offense group (e.g., Harer and Steffensmeier, 1996; Steiner and Wooldredge, 2013). We considered examining the number of drug/alcohol offenses committed during the study window, but too few inmates were written up for more than one of these offenses during this time to generate reliable estimates, even with the negative binomial (described below). The prevalence of drug/alcohol offenses is also heavily skewed ( $\bar{x} = .03$ ,  $s = .16$ ), posing a potential problem for binary logistic regression with the smaller sample of 1,295 inmates.

**Table 1. Description of Measures for the Models of Inmate Misconduct**

| Measures   | Full Sample |        | Reduced Sample |        |
|--|-------------|--------|----------------|--------|
|  | $\bar{x}$   | (s)    | $\bar{x}$      | (s)    |
| Outcomes   |             |        |                |        |
| # disciplinary tickets issued for ---- during 6 months following survey date   |             |        |                |        |
| violence against an inmate or staff member   | .07         | (.31)  | .10            | (.34)  |
| nonviolent offense excluding drugs   | 1.09        | (2.00) | 1.64           | (2.45) |
| Level I Predictors: Inmates  |             |        |                |        |
| Prison Officer Legitimacy (latent variable of...) <sup>a</sup>   | 2.45        | (.94)  | 2.24           | (.91)  |
| Overall, the correctional officers here do a good job  | 2.40        | (.92)  | 2.20           | (.90)  |
| The correctional officers are generally fair to inmates  | 2.52        | (.95)  | 2.31           | (.95)  |
| Correctional officers treat me the same as any other inmate here   | 1.72        | (.82)  | 1.60           | (.77)  |
| Correctional officers treat some inmates better than others (reverse coded)  |             |        |                |        |
| Procedural justice (latent variable of...) <sup>b</sup>  |             |        |                |        |
| Overall, I was satisfied with how the correctional officers treated me   | —           | —      | .36            | (.48)  |
| The staff were polite  | —           | —      | .36            | (.48)  |
| The staff showed concern for my rights   | —           | —      | .24            | (.43)  |
| Overall, the staff treated me fairly   | —           | —      | .36            | (.48)  |
| Overall, the procedures used by the staff to handle the situation were fair  | —           | —      | .42            | (.49)  |
| The staff got the information they needed to make a good decision about the incident   | —           | —      | .37            | (.48)  |
| The staff tried to bring the problem out into the open so that it could be solved  | —           | —      | .32            | (.47)  |
| The staff were honest with me  | —           | —      | .43            | (.50)  |
| The staff gave me a chance to tell my side of the story  | —           | —      | .55            | (.50)  |
| Distributive Justice (latent variable of...) <sup>c</sup>  |             |        |                |        |
| The outcome of the contact with correctional staff was (worse than/what/better than) I expected                                | —           | —      | 1.79           | (.67)  |
| My outcome was (worse than/about the same as/better than) the outcomes other inmates typically receive for the same violation  | —           | —      | 1.83           | (.61)  |
| The outcome of the incident with the staff was (worse than/about the same as/better than) outcomes I have received in the past | —           | —      | 1.83           | (.61)  |

(Continued)

**Table 1. Continued**

| Measures  | Full Sample |         | Reduced Sample |         |
|---|-------------|---------|----------------|---------|
|   | $\bar{x}$   | (s)     | $\bar{x}$      | (s)     |
| The outcome of this incident was (worse than/what/better than) I expected | —           | —       | 1.47           | (.58)   |
| Statistical Controls <sup>d</sup>   |             |         |                |         |
| Age at survey (in years)  | 37.07       | (11.65) | 33.89          | (10.10) |
| Male  | .89         | (.24)   | .90            | (.30)   |
| African American  | .48         | (.49)   | .49            | (.50)   |
| Other non-White   | .02         | (.14)   | .02            | (.12)   |
| Social integration <sup>e</sup>   | 1.23        | (.86)   | 1.19           | (.84)   |
| Gang member   | .16         | (.37)   | .20            | (.40)   |
| Used drugs within month before arrest                                     | .54         | (.50)   | .63            | (.48)   |
| Incarcerated for violent crime  | .45         | (.50)   | .46            | (.50)   |
| Prior incarceration   | .48         | (.50)   | .49            | (.50)   |
| Security risk level   | 1.99        | (.83)   | 2.10           | (.85)   |
| # months served in facility (natural log)                                 | 2.96        | (.84)   | 2.91           | (.80)   |
| # hrs. in education classes per week (natural log)                        | .54         | (.99)   | .52            | (.98)   |
| # hrs. in job per week (natural log)                                      | 2.04        | (1.38)  | 2.03           | (1.39)  |
| # hrs. in recreation per week (natural log)                               | 1.53        | (1.15)  | 1.58           | (1.14)  |
| Victim of theft past 6 months   | .27         | (.45)   | .36            | (.48)   |
| Victim of assault past 6 months   | .07         | (.26)   | .12            | (.32)   |
| Confronted by staff for rule violation                                    | .34         | (.47)   | —              | —       |
| Issued a disciplinary ticket for incident                                 | —           | —       | .82            | (.38)   |
| Satisfied with outcome of incident  | —           | —       | .32            | (.47)   |
| Level 2 Predictors: Prisons   |             |         |                |         |
| Ratio of prison officers to inmates                                       | .25         | (.37)   | .25            | (.37)   |
| Staff racial heterogeneity  | .32         | (.16)   | .32            | (.16)   |
| Power bases (prison-level means of officer survey items) <sup>1</sup>     |             |         |                |         |
| Positional—Inmates typically do what I ask them to because                | 2.87        | (.15)   | 2.87           | (.15)   |
| ... they believe I have the authority to tell them what to do             | 3.45        | (.13)   | 3.45           | (.13)   |
| ... I am fair   |             |         |                |         |

(Continued)

Table 1. Continued

| Measures  | Full Sample |       | Reduced Sample |       |
|---|-------------|-------|----------------|-------|
|   | $\bar{x}$   | (s)   | $\bar{x}$      | (s)   |
| Expert—Inmates typically do what I ask them to because        |             |       |                |       |
| ... of my skills and experience                               | 2.94        | (.15) | 2.94           | (.15) |
| ... they think I know what is best for them                   | 2.22        | (.16) | 2.22           | (.16) |
| Referent—Inmates typically do what I ask them to because      |             |       |                |       |
| ... they want my respect                                      | 2.58        | (.20) | 2.58           | (.20) |
| ... they want my approval                                     | 2.26        | (.18) | 2.26           | (.18) |
| Reward—Inmates typically do what I ask them to because        |             |       |                |       |
| ... I have the ability to influence when they are released    | 1.45        | (.14) | 1.45           | (.14) |
| ... I can give them special help or benefits                  | 1.59        | (.12) | 1.59           | (.12) |
| Coercive—Inmates typically do what I ask them to because      |             |       |                |       |
| ... they fear disciplinary actions                            | 2.55        | (.16) | 2.55           | (.16) |
| ... I can apply pressure or penalize them for not cooperating | 2.31        | (.21) | 2.31           | (.21) |

NOTES: Full sample includes 3,886 inmates across 33 prisons; Reduced sample includes 1,295 inmates across 33 prisons.

<sup>a</sup> Response categories for survey items: strongly agree = 1; agree = 2; disagree = 3; strongly disagree = 4.

<sup>b</sup> Response categories for survey items: agree = 0; disagree = 1. Inmates answered each question for the last time they were confronted by a correctional officer for a rule violation.

<sup>c</sup> Response categories in parentheses coded 1, 2, 3 (respectively).

<sup>d</sup> Level 1 statistical control variables dummy coded (0 = no; 1 = yes) except age, social integration, security risk level, and '# measures.

<sup>e</sup> Additive scale of three binary measures including whether an inmate was married, had at least a high school diploma, and was employed prior to incarceration.

*non-White*), *social integration*, *gang member*, *used drugs in month before arrest*, *incarcerated for violent offense*, *prior incarceration*, *security risk level*, *# months served in facility (natural log)*, *# hours in education classes per week (natural log)*, *# of hours in job per week (natural log)*, *# hours in recreation per week (natural log)*, *victim of theft past 6 months*, and *victim of assault past 6 months*. For the analysis of the entire inmate sample, we also included a measure indicating whether inmates self-reported they had been *confronted by staff for a rule violation* in the 6 months before the survey. The measure is inclusive of incidents that did not result in the inmate receiving an official disciplinary ticket. Inmates' responses to this question were used to select the subsample of inmates who had encounters with prison officers over alleged rule violations. The analysis of the subsample of inmates also included measures of whether inmates were *issued a disciplinary ticket for incident* (restricted to the most recent confrontation with staff during the previous 6 months), whether they were *satisfied with the outcome of the incident*, and their perceptions regarding their specific experiences with the prison staff during their encounter (*distributive justice* and *procedural justice*).

Measures of age, sex, race, gang membership, incarcerated for violent offense, criminal history, and months served were created using data obtained from official records, whereas the other measures were based on inmates' responses to survey questions. The indicator of *social integration* is an additive scale of three dichotomous variables measuring whether an inmate was married, had at least a high school diploma, and was employed prior to incarceration (Wooldredge, Griffin, and Pratt, 2001). We capped the measures of the number of hours in education classes, recreation, or a work assignment at 40 hours and used the natural log of each scale to reduce the skew in these distributions. The measures of victimization were based on whether inmates self-reported victimization by theft or assault in the 6 months prior to the survey. The questions pertaining to both victimizations and whether an inmate was confronted for a rule violation were restricted to the 6 months preceding the survey to minimize recall error.

For the subsample of inmates confronted by staff for rule violations, four survey items tapping *distributive justice* were examined in a CFA ( $\alpha = .78$ ). Similarly, for the latent construct of *procedural justice*, nine survey items reflecting inmates' perceptions of the quality of the treatment and decision-making they received during their most recent encounter with prison staff were examined with CFA ( $\alpha = .90$ ). The items examined for *distributive justice* and *procedural justice* are described in table 1. To ensure that inmates' perceptions of distributive and procedural justice pertained to their specific experiences during an encounter with prison officers, the relevant survey items were preceded by a statement asking inmates to answer about the last time they were confronted by the staff for an alleged rule violation. Only the inmates confronted by prison officers in the past 6 months for a rule violation answered these items.

The survey items for procedural justice and legitimacy described in table 1 might appear on the surface to be measuring the same concept despite how the procedural justice items capture an inmate's perceptions of actual experiences involving only the personnel involved in his or her misconduct incident, whereas the legitimacy items capture an inmate's general perceptions of all facility officers. To investigate discriminant validity between the two sets of items, we conducted two CFAs in *Mplus* to examine the improvement in model fit when moving from a CFA with all 13 items included in one latent construct to a CFA with each group of items included in two separate latent constructs. The two-factor solution was superior to the one-factor solution based on every model

statistic provided, which is also consistent with the modification indices suggesting greater separation between most items in each set. The one-factor solution produced a model fit chi-square of 972.9 ( $df = 35$ ), whereas the two-factor solution produced a model fit chi-square of 191.4 ( $df = 34$ ;  $\Delta\chi^2 = 781.5$ ). For the former, the values of the comparative fit index (CFI), the Tucker Lewis index (TLI), and the root mean square error of approximation (RMSEA) were .94, .94, and .10 (respectively) versus .99, .99, and .03 for the two-factor solution. Ideally, values of the CFI and TLI should be greater than .95 (closer to 1.0 is better), and values of the RMSEA should be less than .05 (closer to 0.00 is better) (Byrne, 2012). Both CFAs were statistically significant but that is to be expected based on the theoretical link between procedural justice and legitimacy, as previously discussed.

The prison-level measures of power bases were derived from ten survey items from the officer survey, including two items per power base. The specific wording of each item is presented in table 1. Five of the ten items reflect Hepburn's (1985) original wording for each power base, and we added one additional item per type to capture the slightly broader definition of each. For the analysis described here, we aggregated the measures to the prison level and conducted a confirmatory factor analysis to test whether the items within each pair of power bases could be combined to create latent variables (described in the next section).

The other prison-level measures considered for the final models included architectural design (*linear design with celled housing, linear design with dormitory housing, campus design with celled housing, campus design with dormitory housing*), security level ( $\geq$  *maximum security,  $\geq$  close security, medium security, minimum security*), size (*design capacity*), and crowding (*ratio of population to design capacity, average number of inmate per housing unit, inmate population, inmate racial heterogeneity, average custody level, ratio of prison officers to inmates, and staff racial heterogeneity*). These measures were derived from official records.

## STATISTICAL ANALYSIS

CFA and path analysis with *Mplus* 6 were used for the analysis. We originally wanted to use structural equation modeling (SEM), which involves both a CFA and a path analysis in a single procedure. That is, the two steps of SEM include estimation of a measurement model for one or more latent constructs tested with CFA, followed by estimation of structural paths (direct and indirect effects) that include the latent variables. The data demands were too great, however, to be able to estimate multilevel negative binomial models with only 33 prisons at level 2 in conjunction with latent constructs at both levels of analysis and 20 level 1 control variables. Therefore, we first conducted CFAs to refine and establish our factors at each level of analysis, and then we created these factors for inclusion as observed variables for each multivariate model of direct and indirect effects (Kline, 2016).

The hypothesized latent constructs are “supported” by a CFA. If the loadings on each factor are statistically significant at a predetermined level, each item loads significantly only on the hypothesized factor, and model fit is satisfactory. By default in *Mplus*, the loading of each item listed first in a latent construct is fixed to 1.00 with a standard error of 0.00. The alpha levels of the remaining items in each construct are then evaluated accordingly, but there is no significance “test” for the first item. To assess model fit for

each CFA, we used the CFI, the TLI, and the RMSEA.<sup>4</sup> Modification indices reveal ways to improve model fit although evaluations of these statistics must be tempered with theory because the indices are driven purely by the math and ignore theoretical considerations (e.g., one modification index might suggest allowing the same item to cross-load on every hypothesized factor). Therefore, these indices should be treated only as suggestions and the user should choose which ones to follow based on theory.

Once all conditions for satisfactory CFAs were met, we created the suggested factors and included them as observed variables along with all statistical control variables in the regression models of inmate infractions. All models were bi-level, with inmates at level 1 and prisons at level 2. The two bi-level data sets for the analysis included 1) all inmates regardless of whether they engaged in rule violations during the 6 months preceding the survey (the “full sample”) nested within all Ohio prisons, and 2) only inmates confronted by staff for rule violations during the 6 months preceding the survey (the “reduced sample”) nested within all prisons.

Given differences in management practices, organizational cultures, and officer morale across prisons (even in the same state), it is important to recognize that such differences could generate between-prison differences in rule enforcement. Group mean-centering the inmate-level variables might be important in this regard to target only within-prison differences in the incidence of misconduct at level 1, so as not to generate spurious effects at level 1 that might be linked to unmeasured organizational differences at level 2 (e.g., inmate perceptions of officer legitimacy and staff morale in a facility). On the other hand, grand mean-centering the inmate-level variables is useful for controlling for compositional differences in inmate populations across facilities that might also be linked to organizational differences at level 2 (e.g., allowing aggregate levels of inmate perceptions of officer legitimacy to account for variation in rates of infractions to provide more rigorous tests of officers’ use of power at the facility level). We estimated the models with both centering methods and found that both sets of models produced the same conclusions regarding the relative magnitude of level 1 estimates and the groups of significant versus nonsignificant predictors (with the exception of the significance of security level for the full sample). The models with grand mean-centering are displayed here because they might provide more reliable estimates for the facility effects examined.<sup>5</sup>

The sample of 33 prisons prohibited the inclusion of all prison-level measures as a result of limited degrees of freedom. Therefore, aside from the power base measures, we identified only those predictors that maintained significant zero-order relationships with the outcome measures. Only the ratio of prison officers to inmates and staff racial heterogeneity was statistically significant, so these were included in each multivariate model. The level 2 models displayed here each included the five power base measures and the two significant covariates. Including all seven measures at level 2 produced a warning in *Mplus* regarding the trustworthiness of the standard errors of the estimates as a result of the number of clusters relative to the number of parameters to be estimated. This prompted

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4. Byrne (2012) suggested focusing on these statistics instead of on the goodness of fit chi-square when the indicators in a CFA are treated as categorical rather than as continuous, which they were for the study given the ordinal scales of the survey items. As noted earlier, the values of the CFI and TLI should be greater than .95, and the values of the RMSEA should be less than .05 (Byrne, 2012).

5. Models with group mean-centering at level 1 are available by request from the second author.



us to estimate separate models for each power base, where each model included the two statistical controls and one of the five power bases.<sup>6</sup> For both the full and the reduced sample, most parameter estimates from the level 2 models with all power bases included fell into 95 percent confidence intervals for the corresponding estimates from the separate models (all but 3 out of 16 estimates). As the estimates and the substantive conclusions derived from those estimates are similar, here we present the models with seven level 2 predictors for the sake of data reduction.

Models of inmate rule breaking with direct effects only were estimated first, for both the full and reduced samples, followed by the models of direct *and* indirect effects for the reduced sample only. (The hypothesized indirect effects were relevant only to the reduced sample because of the focus on distributive justice and procedural justice for inmates confronted for rule violations.) Direct effects on the incidence of violent and nonviolent rule violations were examined with negative binomial regression. Negative binomial models in *Mplus* do not produce the model fit statistics mentioned earlier for the CFAs because of their sensitivities to skewed outcome distributions. Therefore, we present Akaike's information criterion (AIC) instead, which is similar in interpretation to the Expected Cross-Validation Index common in SEM but unavailable in *Mplus* (Byrne, 2012). AIC is computed as  $-2(\log \text{likelihood}) + 2(\# \text{ estimated parameters})$  and is assessed by comparing the change in value between the full and null models.

A drawback to negative binomial models, and for Poisson regression, is the inability to estimate indirect effects because the product of paths linking an exogenous variable to an endogenous count variable is not interpretable whether the count is the mediator or the final outcome in these models (Muthén, 2012). For the analysis of indirect effects only, therefore, we examined the prevalence of violent and nonviolent misconduct rather than the incidence of misconduct. As noted earlier, the findings for all direct effects in the full and reduced samples were very similar for the incidence and prevalence outcomes. We decided to focus primarily on the incidence of misconduct because the number of rule violations captures variance in both the prevalence of misconduct (values of zero versus one or more) as well as the frequency of misconduct during the study period. Unfortunately, we were restricted to the prevalence measures for the analysis of indirect effects in the path models for the reduced sample.

Regarding the CFAs of interest, the first CFA was conducted with the full sample of inmates to test whether the four items tapping correctional officer legitimacy could be combined into a single latent variable reflecting the broader concept of "perceived legitimacy" at the inmate level. Next, a CFA of the ten items tapping prison officer power bases was conducted to test whether the two items capturing each power base could be combined to create five distinct latent variables reflecting the exercise of positional, expert, referent, reward, and coercive power at the prison level. (Recall that each of these ten items was aggregated to the prison level from officer survey data, so the CFA is based on mean levels of these responses across the 33 prisons examined. These factors were used in the bi-level models for both the full and reduced inmate samples.) Finally, a CFA for the reduced sample of inmates was conducted to test three latent constructs including prison officer legitimacy (including the same items as in the corresponding CFA for the full sample), distributive justice (reflecting the four items of inmates' perceptions of

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6. Available by request from the second author.

**Table 2. Confirmatory Factor Analysis of Prison Officer Legitimacy for the Full Inmate Sample ( $n_1 = 3,886$ )**

| Items   | <i>B</i> | (SE)  |
|---|----------|-------|
| Overall, the correctional officers here do a good job                       | 1.00     | (.00) |
| The correctional officers are generally fair to inmates                     | 1.02***  | (.02) |
| Correctional officers treat me the same as any other inmate here            | .82***   | (.01) |
| Correctional officers treat some inmates better than others (reverse coded) | .21***   | (.02) |

NOTES: Comparative fit index (CFI) = .995, Tucker Lewis index (TLI) = .984, root mean square error of approximation (RMSEA) = .099.

\*\*\* $p < .001$  (two-tailed).

the fairness of the outcomes from their encounter with officers), and procedural justice (the nine items tapping inmates' perceptions of how officers treated them during their encounter).

## RESULTS

### CONFIRMATORY FACTOR ANALYSES

The results of the first CFA are displayed in table 2. We tested whether the four items tapping prison officer legitimacy could be combined into a single latent variable for the full inmate sample. All items loaded significantly ( $p < .001$ ) on a single factor, and the CFA and TLI model statistics indicated a good fit to the data.<sup>7</sup> Therefore, based on the CFI and TLI statistics, we retained all four measures when creating the legitimacy factor for the models of rule violations for the full sample.<sup>8</sup>

In the second CFA, we tested whether the ten power base items from the officer survey data, each one aggregated to the prison level, could be grouped "cleanly" into the five power bases defined earlier. The results from the initial CFA are displayed in table 3. When assessing statistical significance, we used  $p < .10$  because the sample included only 33 prisons. Even though the RMSEA fell below the upper threshold of .05 for good model fit, the CFI and TLI statistics fell below the desired minimum threshold of .95. Moreover, the loading for the second item capturing coercive power was not statistically significant ( $p > .10$ ), indicating that it should not be combined with the first item tapping coercive power. Based on these results, we revised the CFA by dropping both coercive power items. All loadings from the revised CFA were significant and each model statistic met the corresponding criteria for good fit. Therefore, for the analysis of rule violations, we created two-item factors of positional, expert, referent, and reward power while including only the second item tapping coercive power because it is consistent with Hepburn (1985).

7. On the other hand, the RMSEA of roughly .10 falls above the preferred criteria of .05, and the coefficient for the last item in table 2 ("officers treat some inmates better than others") is lower than the coefficients for the first three items. The CFI and TLI statistics, however, are better assessments of misspecified factor pattern coefficients relative to the RMSEA (Kline, 2016).

8. Separate regression models were estimated with a three-item legitimacy factor versus the four-item legitimacy factor and produced no differences in the statistical significance and substantive magnitude of any of the effects of theoretical interest (officer legitimacy at level 1, and exercise of power at level 2). Models with the three-item legitimacy factor are available from the second author.

**Table 3. Confirmatory Factor Analysis of Prison Officer Power Bases for the Prison Sample ( $n_2 = 33$ )**

| Items   | <i>B</i>          | (SE)   |
|---|-------------------|--------|
| Inmates typically do what I ask them to because...            |                   |        |
| Positional  |                   |        |
| ... they believe I have the authority to tell them what to do | 1.00              | (.00)  |
| ... I am fair   | 1.08**            | (.51)  |
| Expert  |                   |        |
| ... of my skills and experience                               | 1.00              | (.00)  |
| ... they think I know what is best for them                   | 2.53 <sup>+</sup> | (1.62) |
| Referent  |                   |        |
| ... they want my respect                                      | 1.00              | (.00)  |
| ... they want my approval                                     | 1.08**            | (.32)  |
| Reward  |                   |        |
| ... I have the ability to influence when they are released    | 1.00              | (.00)  |
| ... I can give them special help or benefits                  | 1.03 <sup>+</sup> | (.60)  |
| Coercive  |                   |        |
| ... they fear disciplinary actions                            | 1.00              | (.00)  |
| ... I can apply pressure or penalize them for not cooperating | .00               | (.01)  |

NOTES: Comparative fit index (CFI) = .896, Tucker Lewis index (TLI) = .793, root mean square error of approximation (RMSEA) = .011.

<sup>+</sup> $p < .10$ ; \*\* $p < .01$  (two-tailed).

The final CFA was performed with the reduced sample of inmates who were confronted for rule violations (Table 4). The analysis tested whether each set of items tapping legitimacy, procedural justice, and distributive justice could be treated as latent constructs of these concepts. All items loaded significantly on their respective factors ( $p < .001$ ), and the three model statistics indicated good fit to the data (CFI and TLI  $> .95$ ; RMSEA  $< .05$ ). No modifications to the hypothesized constructs were necessary, so these three factors were created for inclusion in the rule violations models for the reduced sample.<sup>9</sup>

#### BI-LEVEL DIRECT EFFECTS ON INMATE RULE BREAKING: FULL SAMPLE

The bi-level negative binomial models of violent and nonviolent rule violations during incarceration are displayed in table 5. As described in the last section, this table displays the full model with all power base measures included. We also estimated separate models for each power base due to limited degrees of freedom at level 2 ( $n_2 = 33$ ), and any differences in findings between the two sets of models are described as follows.

Inmates' perceptions of prison officer legitimacy maintained inverse relationships with both violent and nonviolent rule violations (postsurvey), but only the latter was statistically significant. In other words, inmates who were more likely to perceive officers as fair and just were significantly less likely to engage in subsequent nonviolent rule infractions, but they were not less likely than other inmates to engage in violence. The magnitude of the legitimacy effect is identical in both models, however, and the relative difference

9. Separate regression models were estimated with a three-item legitimacy factor versus the four-item legitimacy factor. As we found for the full sample, there were no differences in the statistical significance and substantive magnitude of any of the effects of theoretical interest (officer legitimacy, procedural justice, and distributive justice at level 1, and exercise of power at level 2). Models with the three-item legitimacy factor are available from the second author.

**Table 4. Confirmatory Factor Analysis for the Reduced Inmate Sample ( $n_1 = 1,295$ )**

| Items   | <i>B</i> | (SE)  |
|---|----------|-------|
| Prison officer legitimacy   |          |       |
| Overall, the correctional officers here do a good job   | 1.00     | (.00) |
| The correctional officers are generally fair to inmates   | 1.07***  | (.04) |
| Correctional officers treat me the same as any other inmate here  | .79***   | (.03) |
| Correctional officers treat some inmates better than others (reverse coded)   | .41***   | (.05) |
| Distributive justice  |          |       |
| The outcome of the contact with correctional staff was (better than/what/worse than) I expected                               | 1.00     | (.00) |
| My outcome was (better than/about the same as/worse than) the outcomes other inmates typically receive for the same violation | .99***   | (.04) |
| The outcome of the contact with correctional staff was (better than/what/worse than) I expected                               | 1.00***  | (.05) |
| My outcome was (better than/about the same as/worse than) the outcomes other inmates typically receive for the same violation | 1.32***  | (.06) |
| Procedural justice  |          |       |
| Overall, I was satisfied with how the correctional officers treated me  | 1.00     | (.00) |
| The staff were polite   | .88***   | (.02) |
| The staff showed concern for my rights  | .96***   | (.02) |
| Overall, the staff treated me fairly  | 1.04***  | (.02) |
| Overall, the procedures used by the staff to handle the situation were fair   | .97***   | (.02) |
| The staff got the information they needed to make a good decision about the incident  | .94***   | (.02) |
| The staff tried to bring the problem out into the open so that it could be solved   | .82***   | (.03) |
| The staff were honest with me   | .87***   | (.02) |
| The staff gave me a chance to tell my side of the story   | .66***   | (.03) |

NOTES: Comparative fit index (CFI) = .983, Tucker Lewis index (TLI) = .980, root mean square error of approximation (RMSEA) = .045.  
 \*\*\*  $p < .001$  (two-tailed).

**Table 5. Bi-level Negative Binomial Models of Misconduct Counts (During 6-Month Period) for the Full Sample**

| Variable  | Violent  |       | Nonviolent |       |
|---|----------|-------|------------|-------|
|   | <i>B</i> | (SE)  | <i>B</i>   | (SE)  |
| Level 1: Inmates ( $n_1 = 3,886$ )              |          |       |            |       |
| Prison officer legitimacy                       | -.10     | (.07) | -.10**     | (.03) |
| Age at survey (in years)                        | -.03**   | (.01) | -.04***    | (.00) |
| Male  | .24      | (.42) | -.11       | (.16) |
| African American                                | .31**    | (.11) | .32***     | (.06) |
| Other non-White                                 | -.66     | (.66) | -.30       | (.19) |
| Social integration                              | -.09     | (.07) | -.10*      | (.05) |
| Gang member                                     | .39**    | (.13) | .10        | (.07) |
| Used drugs within month before arrest           | -.09     | (.14) | .11*       | (.06) |
| Incarcerated for violent crime                  | .22      | (.15) | -.00       | (.07) |
| Prior incarceration                             | .28*     | (.12) | .26***     | (.05) |
| Security risk level                             | .41**    | (.15) | .15*       | (.06) |
| # months served in facility (natural log)       | -.28**   | (.09) | -.29***    | (.04) |
| # hrs. in education classes per week            | .00      | (.08) | -.02       | (.02) |
| # hrs. in job per week (natural log)            | -.13**   | (.05) | -.06**     | (.02) |
| # hrs. in recreation per week (natural log)     | .03      | (.06) | -.06**     | (.02) |
| Victim of theft past 6 months                   | .02      | (.16) | .14*       | (.06) |
| Victim of assault past 6 months                 | .45*     | (.23) | .20*       | (.10) |
| Confronted by staff for last rule violation     | .19      | (.13) | .43***     | (.05) |
| Level 2: Prisons ( $n_2 = 33$ )                 |          |       |            |       |
| Intercept                                       | -4.19    |       | -.92       |       |
| Ratio of prison officers to inmates             | .25      | (.66) | -.50*      | (.20) |
| Staff racial heterogeneity                      | -1.60    | (.90) | -1.21*     | (.53) |
| Level of positional power exercised by officers | -.38**   | (.13) | -.17**     | (.07) |
| Level of expert power exercised by officers     | -.07     | (.14) | -.13*      | (.06) |
| Level of referent power exercised by officers   | .29      | (.19) | .16*       | (.08) |
| Level of reward power exercised by officers     | -.05     | (.13) | -.00       | (.06) |
| Level of coercive power exercised by officers   | .59      | (.70) | .42        | (.35) |
| Akaike's information criterion (AIC)            | 1,844    |       | 9,901      |       |

NOTE: Robust maximum likelihood estimator.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (two-tailed).

in statistical significance between the models is a result of the more efficient estimate (smaller standard error) for nonviolent rule violations. In short, inmates' perceptions of officer legitimacy may only exert a modest impact on inmate rule breaking.

The next finding of theoretical interest is for the level of positional power exerted by officers at the prison level. The effect of positional power on each type of misconduct was in the predicted (inverse) direction and statistically significant. In contrast to the magnitude of the effect of officer legitimacy, the effect of positional power was stronger in the model of violent infractions. This was also the only significant level 2 predictor of violent rule violations, whereas expert power, the ratio of officers to inmates, and staff racial heterogeneity were significant predictors in the expected directions in the model of nonviolent infractions. Simply put, prisons with more officers relative to inmates, greater racial heterogeneity among staff, and with officers who generally rely more on the use of positional or expert power for inmate management tend to experience lower rates of nonviolent rule breaking.

The level of referent power exercised in prison was also a significant predictor of non-violent infractions but in the opposite direction to what might be expected based on

our earlier discussion. Greater exercise of referent power coincided with higher rates of nonviolent misconduct.

Regarding the separate models with one power base measure only (plus the two covariates), these models revealed that expert power was a significant predictor of *both* violent and nonviolent misconduct (in the expected direction), whereas it was a significant predictor of nonviolent infractions only in the model with all power base measures included. The separate models also indicated that greater use of reward power and coercive power each corresponded with significantly higher rates of violent infractions ( $p < .05$ ;  $b = .18$  and  $.24$ , respectively). Although these findings are consistent with predictions of more violence with greater officer reliance on either coercive or reward power at the prison level, each model did not control for the other power bases.

Regarding the other level 1 factors included as statistical controls, we see a higher incidence of both violent and nonviolent rule violations (postsurvey) among inmates who are younger, African American, with histories of incarceration, are housed in more secure units, have served less time in prison, work fewer hours at jobs each week, and who were victimized by assault during the previous 6 months. Violence was also more frequent among gang members, whereas nonviolent infractions were also more frequent among inmates lower on the index of social integration, who used drugs during the month prior to arrest, who spent fewer hours each week in recreation, who were victimized by theft during the previous 6 months, and who were confronted by staff for their last rule violation. Thus, the study findings pertaining to the control variables are in line with much of the extant research on prisoner rule breaking (see Steiner, Butler, and Ellison, 2014, for a review of this literature).

#### BI-LEVEL DIRECT AND INDIRECT EFFECTS ON INMATE RULE BREAKING: REDUCED SAMPLE

The findings from the analysis of inmates confronted by prison officers for rule violations (reduced sample) revealed the effects of their perceptions of 1) officer legitimacy, 2) fairness of the treatment they received from officers during their encounter for a rule violation, and 3) fairness of the outcome of the encounter on their subsequent incidence of rule violations. The findings for all direct effects are displayed in table 6, and those for the indirect effects of procedural justice (via legitimacy and distributive justice) and distributive justice (via legitimacy) are displayed in table 7.<sup>10</sup> Recall that the indirect effects were estimated for the prevalence of misconduct instead of for the incidence of misconduct because indirect effects involving counts estimated with Poisson or negative binomial regression are not interpretable (Muthén, 2012).

Procedural justice maintained a significant inverse effect on nonviolent infractions, as predicted, but it was not significantly related to violent misconduct. By contrast, inmates' perceptions of officer legitimacy did not directly influence either form of rule breaking. Procedural justice, however, displayed a significant *indirect* effect on the prevalence of nonviolent misconduct via legitimacy (table 7). Although the remaining findings displayed in table 7 reveal no other significant indirect effects on the odds of either violent or nonviolent misconduct, the significant and inverse direct and indirect

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10. We excluded outcome satisfaction from the analyses because it was strongly correlated with both procedural justice and distributive justice, such that multicollinearity became a problem.

**Table 6. Bi-level Negative Binomial Models of Misconduct Counts (During 6-Month Period) for the Reduced Sample**

| Variable  | Violent  |       | Nonviolent |       |
|---|----------|-------|------------|-------|
|   | <i>B</i> | (SE)  | <i>B</i>   | (SE)  |
| Level 1: Inmates ( $n_1 = 1,295$ )              |          |       |            |       |
| Prison officer legitimacy                       | -.09     | (.14) | -.04       | (.04) |
| Procedural justice                              | .01      | (.10) | -.13**     | (.05) |
| Distributive justice                            | .09      | (.10) | .06        | (.03) |
| Age at survey (in years)                        | -.52**   | (.16) | -.35***    | (.05) |
| Male  | .22      | (.14) | -.01       | (.05) |
| African American                                | .15      | (.13) | .11*       | (.05) |
| Other non-White                                 | .02      | (.09) | -.09       | (.07) |
| Social integration                              | .00      | (.12) | -.09       | (.06) |
| Gang member                                     | .12      | (.10) | .04        | (.04) |
| Used drugs within month before arrest           | -.24     | (.23) | .11        | (.09) |
| Incarcerated for violent crime                  | .14      | (.20) | -.03       | (.08) |
| Prior incarceration                             | .39**    | (.14) | .10        | (.09) |
| Security risk level                             | .32      | (.19) | .06        | (.05) |
| # months served in facility (natural log)       | -.29**   | (.12) | -.24***    | (.05) |
| # hrs. in education classes per week            | .00      | (.08) | -.01       | (.03) |
| # hrs. in job per week (natural log)            | -.14     | (.11) | -.04       | (.03) |
| # hrs. in recreation per week (natural log)     | -.09     | (.10) | -.06       | (.03) |
| Victim of theft past 6 months                   | -.10     | (.22) | .04        | (.09) |
| Victim of assault past 6 months                 | .10      | (.24) | .11        | (.11) |
| Issued a disciplinary ticket for incident       | .05      | (.09) | .09*       | (.04) |
| Level 2: Prisons ( $n_2 = 33$ )                 |          |       |            |       |
| Intercept                                       | -4.39    |       | -1.50      |       |
| Ratio of prison officers to inmates             | .91      | (.62) | -.50*      | (.26) |
| Staff racial heterogeneity                      | -3.34*** | (.90) | -1.48*     | (.59) |
| Level of positional power exercised by officers | -.47**   | (.18) | -.20**     | (.07) |
| Level of expert power exercised by officers     | -.10     | (.15) | -.17*      | (.07) |
| Level of referent power exercised by officers   | .66***   | (.17) | .19*       | (.10) |
| Level of reward power exercised by officers     | .26      | (.21) | .01        | (.07) |
| Level of coercive power exercised by officers   | .88      | (.78) | .87*       | (.39) |
| Akaike's information criterion (AIC)            | 795      |       | 4,243      |       |

NOTE: Robust maximum likelihood estimator.  
 \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$  (two-tailed).

**Table 7. Indirect Effects of Procedural Justice and Distributive Justice on the Prevalence of Misconduct (During 6-Month Period) for the Reduced Sample**

| Variable   | Violent  |       | Nonviolent |       |
|--|----------|-------|------------|-------|
|  | <i>B</i> | (SE)  | <i>B</i>   | (SE)  |
| Procedural justice                               |          |       |            |       |
| indirect via legitimacy                          | -.02     | (.03) | -.05*      | (.02) |
| indirect via distributive justice and legitimacy | .00      | (.00) | .00        | (.00) |
| Distributive justice                             |          |       |            |       |
| indirect via legitimacy                          | .00      | (.00) | .00        | (.00) |

NOTES: Comparative fit indices (CFI) = .923 (violent) and .928 (nonviolent); Tucker Lewis indices (TLI) = .872 (violent) and .879 (nonviolent); root mean square error of approximations (RMSEA) = .032 (violent) and .032 (nonviolent); bi-level model with direct effects included from table 6 ( $n_1 = 1,295$ ;  $n_2 = 33$ ); weighted least squares estimator.

\* $p < .05$  (two-tailed).

effects of procedural justice on nonviolent offenses suggests that procedural justice is relevant to an understanding of nonviolent rule violations in prison, both as a standalone effect and in conjunction with how it shapes inmates' perceptions of officer legitimacy.

The level of positional power exercised by officers at the facility level still mattered for subsequent rates of violent and nonviolent rule violations, which is consistent with results of the analysis of the full sample. Also consistent with the findings from the analysis of the full sample, the ratio of officers to inmates, racial heterogeneity of prison staff, and levels of both expert and referent power were significant predictors of nonviolent misconduct rates. In contrast to the results of the full sample, however, coercive power was a significant predictor of nonviolent misconduct rates in the expected direction; the racial heterogeneity of prison staff was a significant predictor of violent misconduct rates; and the effect of referent power on violent misconduct was significant but not intuitive in terms of its (positive) direction.

Only a handful of the level 1 covariates comprised significant predictors of rule breaking in the reduced sample, in contrast to the multitude of significant level 1 effects in table 5. The incidence of both violent and nonviolent rule violations was higher for younger inmates and those with less time served on their sentences. On the other hand, violence was more common among inmates with prior incarcerations, and non-violent infractions were more common among African Americans (relative to Whites), and among inmates who were issued disciplinary tickets for their last self-reported rule violations.

## DISCUSSION AND CONCLUSION

Power is the ability of one party to influence another (Hepburn, 1985). Scholars have argued that differences in how legal authorities exercise their power coincide with the degree of influence they have over recipients (Bottoms and Tankebe, 2012; Hepburn, 1985; Tyler, 2010). Researchers have found evidence that legal authorities' treatment of individuals during their encounters affects recipients' perceptions regarding the legitimacy of authorities and their odds of subsequent compliance with the law (Mazerolle et al., 2012; Paternoster et al., 1997; Tankebe, 2013; Tyler, 1990). Other researchers have found that how authorities exercise their power in general impacts the degree of compliance across ecological units (Bottoms and Tankebe, 2012; Liebling, 2004; Sparks, Bottoms and Hay, 1996). We assessed these ideas in a coercive environment—prison—by examining the effect of inmates' perceptions of prison officer legitimacy on subsequent rule breaking *within* Ohio prisons and the effects of how officers within a facility generally exercise their power over inmates on *rates* of rule violations *across* prisons.

Regarding a potential relationship between inmates' perception of officer legitimacy and rule breaking, we found evidence that, among inmates in general (i.e., the full sample), those who held stronger views regarding the legitimacy of prison officers subsequently committed fewer nonviolent infractions. Perceived legitimacy did not affect the number of violent offenses inmates committed. We also investigated whether the treatment received by a subsample of inmates during their encounters with prison staff directly or indirectly (through perceived legitimacy) affected their subsequent rule violations. We found no relationship between perceived legitimacy and rule breaking among these inmates, but we did find that inmates treated more fairly and with greater



respect during the encounter (i.e., procedural justice) perpetrated fewer subsequent nonviolent infractions—a finding consistent with Reisig and Mesko (2009) and with Beuersbergen et al. (2015). Inmates' perceptions of procedural justice also affected the odds of subsequent nonviolent infractions indirectly through perceived legitimacy. Neither the treatment inmates received during their encounters with staff nor the outcomes of the encounter affected the number of violent offenses committed. Inmates issued a disciplinary ticket for the incident also perpetrated a greater number of subsequent nonviolent rule violations.

A normative perspective on compliance holds that individuals who receive more fair treatment and outcomes from their encounters with legal authorities will hold stronger beliefs regarding the legitimacy of those authorities and subsequently will be more likely to comply with their directives and the rules they enforce (Bottoms and Tankebe, 2012; Tyler, 1990, 2010). An instrumental perspective on compliance holds that individuals whose encounters with authorities yield outcomes that are less favorable will have lower odds of rule breaking (Tyler, 1990). Our findings from this study of prison inmates' responses to encounters with prison staff revealed very little support for either of these perspectives, with a few notable exceptions such as the direct effects of legitimacy (full sample) and the direct and indirect effects of procedural justice (reduced sample) on nonviolent rule breaking, all favoring a normative perspective. Of course, these findings could be in part a result of our focus on a single interaction between inmates and prison staff. Although most citizens in the general population have few encounters with police officers and court officials during a study period (Tankebe, 2013; Tyler, 1990), in the close confines of a prison, inmates encounter prison staff more frequently for rule violations, and even more often for other matters (Sparks, Bottoms, and Hay, 1996). It is possible that all of these experiences coalesce to shape inmates' perceptions regarding officer legitimacy and, ultimately, their odds of compliance. Indeed, this might explain why we observed an inverse relationship between legitimacy and nonviolent rule violations in our analysis that included *all* inmates and not just those with a single (most recent) encounter with officers.

Long ago, Sparks, Bottoms, and Hay (1996: 60) observed that “*every* instance of brutality in prisons, *every* casual racist joke and demeaning remark, *every* ignored petition, *every* unwarranted bureaucratic delay, *every* inedible meal, *every* arbitrary decision to segregate or transfer without giving clear and well-founded reasons, *every* petty miscarriage of justice, *every* futile and inactive period of time—is delegitimizing” (emphases added). Bottoms and Tankebe (2012) also described an *ongoing* dialogue between power holders and recipients that cultivates legitimacy and fosters compliance. How officers exercise their authority and treat inmates in general may be more important for shaping inmates' perceptions of legitimacy and their compliance than officer–inmate interactions stemming from a single incident.

Our findings pertaining to the effects of prison officers' use of power on rates of rule violations across prisons also support the idea that how officers exercise their power *in general* might impact inmates' general perceptions of officer legitimacy and ultimately rule breaking. We found evidence in both the full and reduced samples that prisons in which officers exercised their authority more lawfully and fairly (positional power) or by relying more on their skills and expertise (expert power) had lower rates of nonviolent rule violations and that prisons in which officers relied more on positional power also had lower rates of violent infractions. In contrast, prisons in which officers relied more on

inmates' respect or admiration (referent power) to gain compliance had higher rates of nonviolent infractions (in the full and reduced samples) and violent infractions (reduced sample). In the reduced sample only, prisons with officers who relied more on coercion also had higher rates of nonviolent infractions.

The finding pertaining to referent power is inconsistent with our expectations. At the risk of post hoc hypothesizing, it is possible that prison officers garner more respect from inmates when they show greater discretion in rule enforcement (Irwin, 1980; Liebling, Price, and Shefer, 2011; Sykes, 1958), although this could also be an artifact of working in prisons with higher levels of inmate offending where full enforcement of the rules is not possible. Such a scenario might generate the co-occurrence of higher levels of referent power *and* nonviolent infractions. Regardless, further investigation of the referent power–rule-breaking relationship in prisons and other coercive settings might be a fruitful avenue for future inquiry.

An overreliance on coercion or force has been associated with defiance and resistance among inmates (Colvin, 1992; Kauffman, 1988). By contrast, Sparks, Bottoms, and Hay (1996) found that prisons in which officers relied less on coercion and more often treated inmates with respect and fairness experienced less violence than did prisons in which officers used coercion more frequently. Liebling (2004) observed that prisons with staff who were fairer with inmates also were more orderly and had better inmate–staff relations. The findings from this study of officers' use of power in Ohio prisons seem to be in line with the findings from these few existing studies.

The results and potential limitations of this study also offer several avenues for future research. First, our study was limited to Ohio prisons. Researchers may wish to replicate our analyses with data collected in other jurisdictions. Second, our outcome measures were based on official rule violations. Even though official measures of rule violations have been determined to be valid indicators of inmate misbehavior (Van Voorhis, 1994; Steiner and Wooldredge, 2014), readers should keep the limitations of these measures in mind when interpreting the findings. Future studies should also be aimed at investigating the relationships observed here using self-reported rule violations as outcomes. An additional avenue for future inquiry that seems fruitful based on the findings from this study could be the relevance of inmates' perception of the treatment they received from officers in encounters outside of those pertaining to rule violations. For instance, inmates who perceive that housing, work, and programming assignments are distributed fairly might perceive officers to be more legitimate, and consequently, they might be more likely to comply with the rules. Inmates who perceive the grievance procedures to be fair might hold stronger views regarding officer legitimacy. Inmates who perceive their overall conditions of confinement to be decent and humane might not hold officers responsible for those conditions, even though they are aware these conditions are often beyond officers' control. In other words, there may be several different ways in which prison officers cultivate legitimacy, and ultimately inmate compliance, and a better understanding of these processes could go a long way toward enhancing institutional and public safety (Bottoms, 1999; Cochran, 2013; Cochran et al., 2014).

The findings of this study and the notion of cultivating inmates' perceptions of fairness and legitimacy have policy ramifications for prison administrators. For instance, our results pertaining to the direct and indirect effects of procedural justice on nonviolent rule infractions are congruent with those from Reisig and Mesko (2009) and from Beuersbergen et al. (2015) and imply that treating inmates with dignity and respect

might reduce problems in prison. Training prison staff on the importance of treating inmates fairly and with respect for order maintenance within the institution, as well as reinforcing that training, could be an effective way to encourage staff to act in a procedurally just manner, not to mention promoting an officer culture that encourages such behavior.

Although we observed that neither fair treatment from staff during the handling of rule infractions (procedural or distributive justice) nor inmates' perceptions regarding officers' legitimacy impacted violent rule infractions, it may be that inmate violence is more an artifact of the situations presented to inmates (e.g., attacked or threatened by another inmate), rather than calculated choices to break the rules (e.g., hiding contraband). If this is the case, these offenses might be more amenable to prevention by reducing opportunities for conflicts via situational controls (e.g., Bottoms, 1999) as opposed to altering the way in which staff treat inmates. On the other hand, we did observe that prisons in which officers relied more on positional power (fairness and lawful authority) to achieve compliance had lower rates of violence, suggesting that promoting the fair and lawful treatment of inmates *in general* among the officer workforce might be a fruitful strategy for prison administrators seeking to reduce the level of violence in their institutions, assuming enough officers are both receptive to and capable of treating inmates in such a manner.

In sum, the findings from this study demonstrate the relevance of prison officers for shaping the degree of inmate rule breaking in prison, although these findings are more supportive of *general* officer effects (their exercise of power over the inmate population and inmates' general perceptions of their authority) as opposed to inmates' perceptions of specific interactions with officers (although the fairness of treatment by staff during particular incidents of misconduct may have some relevance). Scholars have argued that prison officers transmit prison policy and penal culture to the confined (Garland, 1990; Lipsky, 1980; Vuolo and Kruttschnitt, 2008). Consistent with this idea is the theme that emerged from our analysis regarding the impact of how officers exercise their authority on inmate misconduct. Prisons with officers who exercise their authority more lawfully and fairly or by relying more on their skills and expertise had lower infraction rates, whereas prisons with officers who relied more on coercion had higher infraction rates. Coupled with the impact of officer legitimacy and procedural justice on the odds of nonviolent infractions at the individual level, these findings suggest that an officer workforce committed to preserving inmates' dignity and helping inmates solve problems can have a significant impact on prison safety.

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