

A Bi-level Framework for Understanding Prisoner Victimization

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Abstract

Objectives To present and test an opportunity perspective on prison inmate victimization.

Methods Stratified random samples of inmates ($n_1 = 5,640$) were selected from Ohio and Kentucky prisons ($n_2 = 46$). Bi-level models of the prevalence of assaults and thefts were estimated. Predictors included indicators of inmate routines/guardianship, target antagonism, and target vulnerability at the individual level, and several indicators of guardianship at the facility level.

Results Assaults were more common among inmates with certain routines and characteristics that might have increased their odds of being victimized (e.g., less time spent in recreation; committed violence themselves during incarceration), and higher levels of assaults characterized environments with lower levels of guardianship (e.g., architectural designs with more “blind spots”, larger populations, and less rigorous rule enforcement as perceived by correctional officers). Similar findings emerged for thefts in addition to stronger individual level effects in prisons with weaker guardianship (e.g., ethnic group differences in the risk of theft were greater in facilities with larger populations and less rigorous rule enforcement).

Conclusions The study produced evidence favoring a bi-level opportunity perspective of inmate victimization, with some unique differences in the relevance of particular concepts between prison and non-prison contexts.

Keywords Inmate victimization · Opportunity theory · Inmates · Prisons

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Introduction

Violent and property victimization rates are much higher inside prison relative to these rates in the general population (Catalano 1995; Wolff et al. 2009; Wooldredge 1998). One might consider this situation to be intuitive given that prison environments are filled with motivated offenders. The literature on inmate gangs and “subcultures” underscores a theme that inmates differ in status among their peers, however, with some more vulnerable to victimization than others (e.g., Irwin 1980, 2005). Placing these individuals in close proximity to each other reflects a maximization of convergence in time and space of suitable targets and persons who are likely to offend given the opportunity.

To the end of providing greater insight into crime prevention inside prison, we examined inmate victimization within a bi-level opportunity framework borrowing from lifestyle/routine activities theories. Data collected from over 5,600 inmates confined within 46 Ohio and Kentucky prisons were examined. Analyses focused on both inmate and facility effects on the prevalence of inmate-on-inmate physical assault and theft of personal property.

A Framework for Understanding Inmate Victimization

A large body of research on inmate misconduct and crimes committed during incarceration has been compiled over the past 15 years while the number of studies of inmate victimization pales by comparison (for a review of the victimization studies, see Wolff et al. 2007c). Victimization studies involving specific contexts are important for developing the most effective crime prevention strategies for those environments (Clarke 1995).

Despite the much higher victimization rates inside prison relative to rates outside prison (Wolff et al. 2007c), Wolff and Shi (2009) found that a majority of inmates in the 14 prisons they examined actually felt safe. This observation suggests that victimization in prison is a non-random process, and findings from inmate victimization studies to date suggest that particular characteristics of *both* inmates and prison environments contribute to victimization risk (Blitz et al. 2008; Ireland 1999; James and Glaze 2006; Kerbs and Jolley 2007; Perez et al. 2010; Wolff et al. 2007a, b, 2008, 2009; Wooldredge 1994, 1998). Here, we consider the relevance of lifestyle/routine activities theories for understanding victimization in prison.

There are several developments in the evolution of these theories that are potentially relevant for an understanding of inmate victimization, including (a) Hindelang et al.’s (1978) original discussion of “lifestyle” factors that influence exposure to high risk situations, (b) Cohen and Felson’s (1979) original conceptualization of “absence of capable guardians”, (c) Finkelhor and Asdigian’s (1996) specification of Cohen and Felson’s (1979) concept of “target suitability” to reflect “vulnerability” and “antagonism”, (d) Garofalo’s (1986) discussion of individual differences in perceptions of vulnerability, and (e) recognition of the importance of both individual and environmental influences on victimization, as described by Miethe and Meier (1994), and Wilcox et al. (2003).

Inmate Lifestyles/Routines and the Absence of Capable Guardians

Hindelang et al. (1978) argued that an individual’s activities operate *indirectly* on their victimization risk based on how those activities increase or decrease exposure to high risk situations. Cohen and Felson (1979) similarly argued that victimization may be explained

by routines that reduce guardianship over suitable targets and allow offenders to be “successful” in their pursuits. This perspective may apply to prisoner victimization given (a) an offender population living in relatively small confines that place so many individuals in close physical proximity, (b) differences in daily routines that coincide with differences in guardianship and exposure to higher risk situations, (c) individuals who vary in their suitability as targets, and (d) between-prison differences in *levels* of guardianship over inmates.

Directly relevant to an opportunity perspective, an inmate’s level of participation in education classes, vocational training, work assignments, recreation, and visitation might influence his or her risk for victimization (Wooldredge 1998). Greater involvement in these activities might reduce the odds of assaults by other inmates because these activities are heavily monitored by custodial and non-custodial staff, thus increasing “guardianship” over one’s person. On the other hand, more structured activities necessarily take inmates away from their personal property, thus reducing guardianship over property and increasing opportunities for theft. Wooldredge (1998) found opposite effects of time spent in education classes on the risk of personal versus property victimizations in three Ohio prisons.

Also relevant to guardianship are an inmate’s custody level and whether s/he is placed in the general population. Assaults and thefts might be more common among inmates classified as lower custody and among those placed in the general population relative to other areas (protective custody, administrative segregation) because of the higher densities of these populations and weaker surveillance levels, similar to Wilcox et al.’s (2003) discussion of increased exposure to risky situations in areas with more dense residential populations and less comprehensive police surveillance.

Target Antagonism and Target Vulnerability

Cohen and Felson (1979) discussed how some potential property targets are more amenable to victimization based on their allure or value to motivated offenders. This idea has since been applied to violent victimization, and Finkelhor and Asdigian (1996) discussed the idea that certain individual attributes may “antagonize” others and increase the odds of attack. “Target antagonism” in prison may be greater among inmates who have been violent themselves if their actions provoke others to retaliation, and among those incarcerated for violence and/or who previously served time if these factors are tied to an inmate’s peer status. Higher peer status might increase the risk of assaults by others who wish to improve their own status and privileges (e.g., Irwin 1980, 2005). Males may also be more likely victims of assault compared to females because men are more apt to provoke fights with other inmates, if only because prisons for men house proportionately more volatile inmates compared to prisons for women (McClellan et al. 1997).

Some inmate attributes may also convey greater “target vulnerability” (Finkelhor and Asdigian 1996; Garofalo 1986; Wilcox et al. 2003). The close confines of imprisonment lead to face-to-face contacts between individuals who, based on their different backgrounds, may not otherwise interact. This context creates opportunities for physical confrontations between dissimilar inmates as well as opportunities to victimize those perceived as easier targets. Inmate demographics (age and race) and social backgrounds (education, employment history, and family status) might be tied to victimization if these factors make inmates appear to be more vulnerable targets. More likely victims may possess characteristics that differ from inmates who are more prone to *engaging* in deviance. Based on extant findings for inmate *offending*, more likely victims may include

inmates who are older, white non-Latino, not gang members, and with attributes reflecting greater conformity to conventional goals (more education, employed at arrest, and living with dependent children) (for a review of related studies, see Steiner and Wooldredge, in press). Some of these factors might also proxy property ownership, where inmates with more stakes in conformity (older, more education, employed at arrest, etc.) also tend to own more property, and, therefore, are more suitable targets for theft. (For analyses of one or more of these background factors, see Ireland 1999; Kerbs and Jolley 2007; Perez et al. 2010; Wolff et al. 2008, 2009; Wooldredge 1994, 1998). Also, inmates with less time spent in the same facility may be less knowledgeable about how to avoid violent victimization and to protect their personal property (McCorkle 1992).

Inmates' perceptions of correctional officers' job performance may also be relevant to target vulnerability. Garofalo (1986) proposed that victimization odds should be lower for persons with perceptions of greater vulnerability because they will take greater precautions to avoid risky situations, but inmates who perceive greater vulnerability might be at *greater* risk for victimization in prison because their options for avoiding offenders are limited. Therefore, inmates who place less confidence in officers to perform their jobs well and to treat inmates fairly may be at higher risk of victimization because they do not feel they can depend on officers to protect them (Liebling 2004; Sparks et al. 1996).

Macro Level Guardianship in Prison

Multi-level perspectives on victimization (e.g., Miethe and Meier 1994; Wilcox et al. 2003) have focused on the importance of specifying both individual and environmental level influences on victimization. In this regard, Cohen and Felson's (1979) concept of "guardianship" over oneself and one's property may be particularly relevant to *inmate* victimization given the priorities of corrections departments to enhance inmate safety. Felson subsequently argued that differences in the restraints placed on motivated offenders may also influence victimization risk (Felson 1986, 1995; Felson and Gottfredson 1984). DiIulio (1987) and Useem and Piehl (2006) have discussed macro level mechanisms designed to reduce prison violence, including prison architecture (DiIulio 1987; Morris and Worrall, in press; Useem and Piehl 2006) and management practices (DiIulio 1987). In short, controls over offenders may explain why "would be" offenders are unable to be successful, even in the presence of suitable targets (Felson 1986). In a prison setting, "guardianship" at the facility level serves to protect inmates by enhancing supervision and restraining motivated offenders. Macro level indicators of guardianship, such as architectural design and how vigorously rules are enforced, might influence an offender's chance for "success."

Architectural designs can inhibit or facilitate the effective supervision of inmates by officers (Irwin 2005). Particular designs may increase victimization rates by reducing restraints over offenders who are familiar with the blind spots of a prison and the travel time of officers to particular locations, and by reducing levels of guardianship over potential targets. Morris and Worrall (in press) compared inmate misconduct (not victimization per se) between Texas prisons with "telephone pole" versus "campus" designs, which are fairly common in most states, and found that these designs had no bearing on the odds of inmate violence, but the campus design was *more* conducive to property misconduct and security violations. Morris and Worrall discussed how the link between campus designs and property misconduct might be due to the "increased access to other inmates" (in press, p. 20) in campus environments. Greater freedom of movement in dormitory housing may also create opportunities for theft by bringing inmates in closer

proximity to each other's property. It may be more difficult for inmates housed in "telephone pole" units with rooms/cells to access property, let alone other inmates.

Regarding management practices, DiIulio (1987) argued that formal administrative controls (consistent with macro-level guardianship) are important for reducing inmate deviance. For example, facilities with larger populations may have higher victimization rates if larger numbers place greater strains on custodial staff to effectively supervise inmates. Facilities designed for larger populations typically have higher rule infraction rates (Wooldredge and Steiner 2009), suggesting that larger populations might also coincide with greater risk for inmate-on-inmate violence and theft of personal property. Strictness of rule enforcement might also be considered an indicator of guardianship at the facility level because lax rule enforcement could lead to more crimes. Inmates may absorb the "culture" of rule enforcement and may be more likely to take advantage of greater leniency shown by officers.

Conditioning Effects of Facility Guardianship

Wilcox et al. (2003) discussed the relevance of conditioning effects in multi-level victimization models, where neighborhood level factors might condition individual effects on victimization risk (often referred to as "cross-level interaction effects"). Their focus on "ambient opportunity" involved contextual influences on victimization opportunities at the individual level. A parallel might be drawn to prison environments, where weaker guardianship at the facility level might create opportunities for certain inmate level processes to manifest themselves. Prisons are necessarily coercive organizations (Hepburn 1985), which may increase the chance that the manifestation of lifestyle effects on victimization risk depends to some extent on the intensity of guardianship operating at the facility level. For example, as discussed by Morris and Worrall (in press), campus style prisons with primarily dorms provide greater freedom of movement relative to telephone pole designs with primarily cells, and a more open environment might generate stronger individual level effects of an inmate's daily activities on assault victimization due to greater opportunities for victimizing less active inmates.

In a perfect system, all inmates would be at zero risk for victimization regardless of their individual differences (i.e., the inmate level effects on victimization discussed earlier). Lower guardianship levels, however, might permit the effects of inmate attributes to manifest themselves, possibly increasing differences in victimization risk based on differences in inmates' daily routines, antagonism towards others, and vulnerability to victimization. Following this perspective, we expected lower levels of facility guardianship to coincide with stronger inmate effects on the risk of assault and theft victimizations.

Methods

The prevalence and incidence of victimization by assault and property theft during a 6-month period of incarceration were originally examined. Assaults and thefts were examined separately. Findings were very similar between the prevalence and incidence models, so only results for the prevalence outcomes are presented here.¹ These outcome measures are described in Table 1. The hypothesized relationships involving inmate and facility level effects are also displayed.

¹ The incidence models are available upon request from the first author.

Samples and Data Collection

Random samples of inmates and officers were selected from the 33 prisons in Ohio, and all 13 state operated prisons in Kentucky.² The size of the inmate samples varied across prisons because of differences in population size, the types of inmates held, and research parameters dictated by the Ohio Department of Rehabilitation and Correction (ODRC) and the Kentucky Department of Corrections (KDOC). We targeted either 130 inmates or 260 inmates per facility in Ohio, and *between* 100 and 200 inmates per facility in Kentucky.

A list of all inmates housed in each facility for at least 6 months was provided by ODRC and KDOC shortly before our visits. (The stipulation of at least 6 months in the facility was necessary to measure victimizations occurring during the previous 6 months.) These lists, supplemented with additional information for purposes of stratification, constituted our sampling frames.³ To adequately capture the experiences of first-time prisoners, we stratified each frame by whether inmates previously served prison time. Next, we randomly selected equal numbers of inmates from each stratum within each facility using SPSS 16.0. These procedures generated a sample of 7,294 inmates across the 46 facilities. These numbers were initially reduced to 6,997 because some inmates from each facility were not available on the survey day (e.g., transferred, on a visit, out to court). A total of 5,640 inmates, or 80 % of all eligible inmates, participated in the study and provided “usable” surveys (excluding those with key questions left unanswered, or those with false id numbers that prevented us from linking the survey data to official data). Cases were weighted to reflect each facility’s population, and comparisons between the weighted samples and the respective inmate populations with at least 6 months served revealed no significant differences in age, sex, race, committing offense, number of prior incarcerations, sentence length, or time served (based on population data provided by ODRC and KDOC).

Administration of the inmate self-report surveys in most facilities involved surveying general population inmates in designated areas such as the gymnasium, visiting area, or chapel, and then surveying inmates in segregation or protective custody in their cells. Confidentiality of the inmates’ responses was enhanced by having inmates complete the surveys outside the direct view of security staff and away from surveillance cameras. After briefly describing the study, a member of the research team gave each inmate a survey and a voluntary consent form that was approved by the University of Cincinnati Institutional Review Board. Each survey was collected by one of the researchers. Inmates were not compensated for their participation.

² Kentucky also has three privately operated facilities for adult offenders. Those facilities were not included in the study per the wishes of the KDOC. With two exceptions, inmates housed in correctional camps, mental health units, reception units, or youthful offender units were excluded due to practical constraints and unmeasured structural and managerial differences that exist between those units and the primary facilities in which these units exist. Inmates housed in the correctional camp at the Ohio State Penitentiary (Ohio’s supermax facility) were included for theoretical reasons dictated by the larger project. Inmates housed in the correctional camp for females at the Trumbull Correctional Institution were also included. Ohio has three other facilities for women, but two of those facilities are pre-release centers, which typically do not house inmates longer than one year. The camp for females at Trumbull Correctional Institution is the most similar institution to the Ohio Reformatory for Women, which is the primary facility for women in Ohio. The camp for females at Trumbull Correctional Institution, which is physically separate from the main facility, was treated as a separate facility in all of the analyses.

³ Non-English speaking inmates were excluded from the sampling frames. The numbers of these inmates were very small and, for the vast majority of prisons, fell below ten inmates per facility in each state.

Table 1 Description of weighted samples and hypothesized effects on victimization odds

	$\bar{x}$	s	Assault	Theft
Outcomes				
Victim of assault during last 6 months	.07	.26	n.a.	n.a.
Victim of property theft during last 6 months	.25	.44	n.a.	n.a.
<i>Level-1: Inmates ($n_1 = 5,640$)</i>				
Activities/guardianship				
# hrs. in recreation per week (natural log)	.17	3.02	–	+
# hrs. in education or vocational training per week (natural log)	–2.22	3.33	–	+
# hrs. in job per week (natural log)	.80	3.24	–	+
# visits during preceding month	.86	1.40	–	+
Custody level (min., med., close, max./supermax.)	1.98	.80	–	–
General population inmate	.94	.24	+	+
Target antagonism				
Male	.94	.24	+	+
Incarcerated for violent crime	.42	.49	+	+
Incarcerated for property crime	.14	.35	–	–
Served prison time before current sentence	.45	.50	–	–
Engaged in violent misconduct during last 6 months	.04	.21	+	+
Engaged in theft during last 6 months	.05	.22	+	+
Target vulnerability				
Age at survey (in years)	37.36	11.66	+	+
African American	.43	.49	–	–
Latino	.02	.14	–	–
High school degree or more	.38	.49	+	+
Employed at arrest	.71	.45	+	+
Lived with children at arrest	.56	.50	+	+
Gang member	.16	.36	–	–
Months served in this facility (natural log)	3.12	.82	–	–
Officer legitimacy #1: good at job, fair to inmates, equitable to me	.00	1.00	–	–
Officer legitimacy #2: other inmates complain, favoritism (reverse coded)	.00	1.00	–	–
<i>Level-2: Facilities ($n_2 = 46$)</i>				
Guardianship (measures explored for inclusion in final models)				
Kentucky prison	.28	.46	–	–
Years in operation	36.37	32.79	+	+
Campus style design with primarily celled housing	.37	.49	–	–
Campus style design with primarily dormitory housing	.17	.38	+	+
Telephone pole style with primarily celled housing	.07	.25	–	–
Telephone pole style with primarily dormitory housing	.09	.29	+	+
Proportion inmates housed in dormitories	.42	.45	+	+
Design capacity	875.30	464.79	+	+
Inmate population on day of survey	1,339.87	833.38	+	+

Table 1 continued

	$\bar{x}$	<i>s</i>	Assault	Theft
Ratio correctional officers: inmates	.22	.31	–	–
Officer perceptions of under-enforcement of rules (factor means)	–.01	.23	+	+

Level-1 measures dummy coded except age, custody level, months served, officer legitimacy. Level-2 dummy variables include Kentucky prison and all architectural design measures

Measures based on official data include age, sex, race, ethnicity, education, offense incarcerated for, prior prison term, custody level, gang membership, misconduct (violence and theft), months served, and inmate population. All other measures based on survey data

Random samples of correctional officers were also drawn, with sample sizes varying based on the size of the officer populations and the wishes of ODRC and KDOC. A list of all line officers and sergeants with direct contact with inmates was provided by each facility, and we employed either simple random sampling or systematic sampling with a random start (depending on the electronic format of the lists provided). Samples ranged from 29 to 178 custodial staff per facility in Ohio, and from 19 to 100 custodial staff in Kentucky. Sample sizes for the Ohio facilities were determined using probabilities proportionate to size, with an oversample of 50 % in anticipation of refusals and incomplete surveys. In Kentucky, we were permitted to include all officers in facilities with fewer than 100 officers, and to randomly select 100 officers from each of the remaining facilities. Officer participation rates were comparable between the two states with 50 % participation overall (1,841 usable surveys), typical of extant studies of correctional officer survey data (Hepburn 1985). Officers in the samples were weighted inversely to their odds of selection. The Ohio sample was not significantly different from the target population regarding officers' sex, race/ethnicity, rank, or length of service. The sample was, however, slightly older than the target population ($\bar{x} = 42.42$ vs. $\mu = 41.34$). The Kentucky sample was not significantly different from the target population on sex, race/ethnicity, and rank. The parameters for length of service and age were unavailable from KDOC for comparisons.

The officer survey packages (including surveys, self-addressed, postage paid return envelopes, and a letter explaining the purposes of the study and voluntary consent to participate) were distributed directly to officers at all roll calls. Two waves of follow-up surveys were distributed to non-respondents in Ohio (3 and 7 weeks following the initial survey), and one follow-up was distributed in Kentucky (6 weeks after the initial survey). Differences in follow-up procedures were based on our assessment that the second follow up in Ohio was not worth the added expense.

Measures and Statistical Analysis

A description of measures is provided in Table 1. The outcome measures examined here included the prevalence of victimization by inmate-on-inmate assault, and by theft of personal property. Inmates were asked how many times each of the following happened to them in the past 6 months: Someone took something that belonged to you when you were not around and without your permission; physically assaulted by an inmate for reasons other than because you tried to hurt him/her first; stabbed by another inmate for reasons other than because you tried to hurt him/her first. The last two items were combined into "assaults" for the analysis. Victimizations were restricted to the 6 months prior to the survey date in order to minimize recall error (Sudman and Bradburn 1982).

Combining all three victimization items into one outcome measure would not have been fruitful because the alpha reliability between property thefts and stabbings was only .02. The low reliability suggests that the two groups of victims are very distinct, raising the possibility that the magnitude of each relationship examined could differ between the two groups. On the other hand, 62 % of the sampled inmates who were stabbed by other inmates were also physically assaulted in separate incidents, suggesting greater overlap in the experiences of these two groups of violently victimized inmates and indicating a relatively high level of internal consistency for the measure of assaults.

The predictors reflected measures constructed from either survey or official data (identified at the base of Table 1). Following our framework for the analysis, the inmate level predictors were divided into *activities/guardianship*, *target antagonism*, and *target vulnerability*. All facility level predictors explored for the analysis reflected *guardianship*. The operationalization of these independent variables is described in the “Appendix”.

The limited number of facilities at level-2 prohibited the inclusion of all the prison level predictors described in Table 1. Therefore, we discuss the zero-order relationships between each of these predictors and the outcome measures in addition to presenting multivariate models including a subset of these predictors. The subset of predictors was determined based on a series of means-as-outcomes models. Each predictor was entered along with a second predictor in order to see which one (if not both) remained significant. Predictors continued to be added and were kept only if they remained statistically significant at $p \leq .10$. (A liberal critical region was chosen based on the sample of 46 prisons.)

Following Morris and Worrall’s (in press) call for analyses of more specific measures of prison architecture, we explored four measures that basically reflect finer distinctions in their original dichotomy. Specifically, each of the campus style and telephone pole style facilities in our sample can be broken down into those with primarily celled housing versus those with primarily dormitory housing. These four styles constitute 70 % of the sampled facilities, with the remaining facilities falling into a residual category of much older “warehouse” prisons, other linear designs, and camps. We also examined the proportion of inmates housed in dormitories, which might also be considered a “design” measure. Also consistent with Morris and Worrall, the age of the facility was examined.

Noticeably absent from the level-2 predictors are sex of the population housed and facility security level. Grand mean-centering the level-1 predictors *male* and *custody level*, however, served to control for compositional differences in these factors across the facilities examined (Raudenbush and Bryk 2002), which accomplishes the same goal as adding aggregated measures to the facility model but without losing degrees of freedom at level-2.

Bi-level models of inmate (level-1) and facility (level-2) effects on the prevalence of victimization were estimated using HLM 7.0 (Raudenbush et al. 2011).⁴ Bernoulli (binary logistic) regression models were estimated for the dichotomous outcome measures. Level-1

⁴ Tri-level modeling, with facilities nested within states, was deemed unnecessary based on estimates of all empirical relationships derived from state-specific bi-level models. That is, all level-1 estimates for Kentucky fell within 95 % confidence intervals for the respective estimates for Ohio. When pooling the data across states and statistically controlling for state location at level-2, all facility estimates were virtually identical with and without the control variable included. Finally, although state location maintained significant zero-order relationships with both outcome measures, where the prevalence of both assaults and thefts were lower in Kentucky, these relationships were rendered nonsignificant when grand mean-centering the level-1 predictors. In other words, it appears that between-state differences in inmate populations accounted for the observed differences in victimization rates across Ohio and Kentucky. For these reasons, data were pooled across states in order to generate the most efficient estimates of level-2 effects.

PRE values cannot be computed for multi-level Bernoulli models in HLM 7.0 (see Raudenbush et al. 2011), so these level-1 estimates were derived using procedures described in Hox (2010: ch. 6). Both level-2 variance estimates were significant ($p < .001$), indicating significant differences in levels of assaults and thefts across facilities.

Random coefficient models were estimated in order to determine whether the magnitude of inmate effects differed significantly across facilities. Significantly varying level-1 effects ($p \leq .05$) were kept as random whereas nonsignificantly varying effects were fixed. Next, intercepts-as-outcomes models were estimated in order to assess the main facility effects on the outcomes at level-2 while controlling for compositional effects based on the level-1 predictors. Level-1 predictors were grand mean-centered in order to permit examination of compositional effects (e.g., whether differences in *levels* of victimization across prisons are due, in part, to differences in the *mean* age of inmate populations).⁵ Finally, slopes-as-outcomes models were estimated in order to determine whether any of the significantly varying level-1 relationships differed in magnitude across prisons due to differences in architecture, inmate population size, and rule enforcement.⁶

The variance estimates in HGLM are derived under the assumption that the level-1 random effects conform to a logistic distribution. Therefore, the distributions of the effects treated as random (including the level-1 intercepts and any significantly varying level-1 effects) were examined using the level-2 residual files produced in HLM 7.0. For each of the effects treated as random, the Kolmogorov–Smirnov test of normality was not statistically significant ($p > .10$), thus failing to refute the assumption that each distribution can be treated as normal.

Level-2 models in HGLM are still linear models based on the ratio outcome at level-2 (i.e., the level-1 intercept for each prison becomes the value of the dependent variable modeled at level-2). The underlying assumptions of linear models were also evaluated using the level-2 residual files produced in HLM 7.0. Inspection of added variable plots (Fox 2008: 256) did not identify any prisons that may have exerted undue influence on the multivariate model statistics. Using the technique developed by Anscombe and Tukey (1963) for identifying potentially problematic outliers, none of the 46 facilities produced standardized residuals that exceeded the minimum threshold determined by their method. Also, partial-residual plots with a nonparametric-regression smoother (Fox 2008: 279) did not reveal non-linearity. Finally, plots of studentized residuals versus predicted values from the multivariate models revealed an ellipse of positive and negative residuals along the scale of predicted values.

Results and Discussion

The percentage of inmates victimized by physical assaults or stabbings across all 46 facilities during the 6-month study period was 7 %, and 25 % were victimized by thefts

⁵ An argument could be made to use group mean-centering with these types of models because some compositional effects could be spurious with unmeasured facility effects. The estimates were very similar using both group mean- and grand mean-centering, so we chose the latter in order to provide more rigorous tests of the level-2 effects examined.

⁶ Models were derived with Laplace estimation using HLM 7.0, which produces coefficients very similar to maximum likelihood estimation while also enabling Chi-square tests of model fit (Raudenbush et al. 2011). The value of Chi-square for model fit is the difference in the Deviance statistic between two models. We compared the fit of each level-1 model relative to the corresponding null (unconditional) model, and each full model (with both level-1 and level-2 predictors) relative to the corresponding level-1 model.

(see Table 1). These figures are considerably higher than the respective rates of assaults and thefts in the general population, which were roughly .23 % and 2 %, respectively, in 2010 (U.S. Department of Justice 2011). Estimates also varied considerably across the 46 facilities, ranging from 1 to 17 % for assaults, and from 7 to 54 % for thefts.

Inmate Level Effects on the Prevalence of Assault

The inmate level models of the odds of each type of victimization are displayed in Table 2.

Inmate Activities and Guardianship

Odds of assault were higher for inmates spending *less* time in recreation yet *more* time working at their jobs, but other activities (education, vocational training, visitation) were irrelevant for predicting these odds. This offers some support for the relevance of particular activities for influencing the risk of assault, but the positive effect of time at work is inconsistent with our original prediction that more time spent in *any* structured activities would reduce the odds of physical victimization. Previous victimization research with general population samples reveal higher odds of physical victimizations for individuals spending more time in less “structured” settings with lower levels of guardianship (as discussed by Wilcox et al. 2003), and this is consistent with the findings for time spent in recreation. Higher odds of assault among persons spending more time at work, however, might be unique to the prison context. Certain jobs in prison may actually increase exposure to higher risk situations without the necessary safety provided by officers. Some jobs require inmates to communicate with potentially volatile individuals, such as telling others to move so they can clean an area, refusing certain requests in the cafeteria, etc. We also observed many inmates working in areas supervised by only one or two officers, and some of these areas in the older prisons (especially around the cafeterias, laundry areas, and gymnasiums) seemed outside officers’ range of vision. Inmate activities are therefore relevant for understanding the risk of physical assault, but perhaps not in ways that are intuitive for populations outside of prison.

Despite higher levels of guardianship over inmates with higher custody scores and those housed in segregation units, the risk of assault was actually *higher* for these inmates. Other aspects of the prison context may operate to undermine the effectiveness of higher custody, such as greater strains placed on higher custody inmates as a consequence of greater deprivations associated with those environments (Blevins et al. 2010). Morris et al. (2012) found that the odds of prisoner misconduct were higher in prisons with greater environmental strains (including larger proportions of higher security inmates), and so the odds of assault victimizations may also be higher in these environments if correctional officers cannot effectively protect inmates from motivated offenders. Also noted by Morris et al. (2012) is the larger number of more violent inmates in these environments, which fits better with the idea of target antagonism. Inmates classified as higher security may run a higher risk of violent victimization as an artifact of being housed with other dangerous offenders, and this “selective migration” increases any one inmate’s exposure to the most violent offenders due to the higher concentrations of these individuals in the same physical space. In short, there is no evidence to suggest that higher custody levels and segregation serve to effectively “guard” prisoners against violent victimization.

Table 2 Level-1 Bernoulli models of victimization odds ($n_1 = 5,640$)

Predictors	Assaults			Thefts		
	β	s.e. $_{\beta}$	e^{β}	β	s.e. $_{\beta}$	e^{β}
<i>Activities/guardianship</i>						
# hrs. in recreation	-.06**	.02	.94	-.04**	.01	.96
# hrs. in education or vocational training	-.03	.02	.97	.01	.01	1.01
# hrs. in job per week	.07**	.02	1.07	.01	.02	1.01
# visits during preceding month	.05	.04	1.05	.03	.03	1.03
Custody level	.50**	.09	1.65	.10*	.04	1.10
General population inmate	-.42*	.18	.66	.11	.15	1.11
<i>Target antagonism</i>						
Male	.02	.29	1.02	-.72**	.21	.49
Incarcerated for violent crime	-.57**	.16	.57	-.20*	.10	.81
Incarcerated for property crime	.10	.21	1.11	.22*	.09	1.24
Served prison time before current sentence	-.23	.15	.80	-.15	.11	.86
Engaged in violent misconduct last 6 months	1.77**	.14	5.88	.48*	.21	1.61
Engaged in theft last 6 months	.48*	.24	1.62	.13	.16	1.13
<i>Target vulnerability</i>						
Age at survey (in years)	-.01	.01	.99	.002	.004	1.00
African American	-.24	.17	.78	-.40**	.08	.67
Latino	.21	.46	1.23	-.42*	.18	.66
High school degree or more	.17	.11	1.18	.20*	.10	1.22
Employed at arrest	.42*	.20	1.52	.17*	.07	1.18
Lived with children at arrest	-.23	.14	.79	.09	.09	1.09
Gang member	.07	.20	1.08	-.30*	.12	.74
Months served in facility	.21*	.10	1.24	-.15**	.04	.86
Officer legitimacy #1	-.17*	.07	.84	-.14**	.03	.87
Officer legitimacy #2	-.15*	.06	.86	-.07*	.03	.93
χ^2 improvement in fit over null model	282.6**			239.7**		
Proportion within-facility variance explained	.22			.37		
Proportion between-facility variance explained	.64			.22		

Laplace estimation used to provide model fit statistics while providing approximations to maximum likelihood coefficients (Raudenbush et al. 2011)

Randomly varying effects at level-2 for the model of assault victimizations include the level-1 y-intercepts and slope estimates for age, with all other effects fixed. Randomly varying effects at level-2 for the model of theft victimizations include the level-1 y-intercepts and slope estimates for African American, Latino, served prison time before current sentence, # hrs. in job per week, and # visits during preceding month, with all other effects fixed

* $p \leq .05$; ** $p \leq .01$

Target Antagonism

Assault victimizations were less likely among inmates incarcerated for violent crimes, yet more likely among those who engaged in either violence or theft during the previous 6 months. Violent inmates were almost six times more likely than non-violent inmates to be victimized, consistent with the idea that these inmates may “antagonize” and provoke others. This particular finding is consistent with the violent offender/victim overlap found

in the general population (e.g., Hough 1987; Lauritsen and Laub 2007). In prison, this overlap might result from retaliations for past actions or from generally “unruly” lifestyles while incarcerated. The positive effect of having engaged in property theft during the previous 6 months is also consistent with the idea that some violent victimization in prison may be a response to previous crimes committed by the victims, although this effect was not nearly as strong as for violent misconduct.

The finding of *lower* odds of assault victimization among inmates incarcerated for violent crimes counters our prediction. In conjunction with the null effects of an inmate’s sex, incarceration for property crimes, and prior imprisonment, these four measures may *not* fit with the idea of “antagonistic” characteristics that provoke others to commit violence.

Target Vulnerability

Findings were mixed for the applicability of target vulnerability to an understanding of assault victimizations, with higher odds for inmates who were employed at arrest, had spent more time at the same facility, and were less likely to perceive officers as equitable and good at their job. Findings for pre-prison employment and officer legitimacy are consistent with predictions, but the positive effect of time at the same facility refutes the idea that more time would coincide with *less* vulnerability. More time at the same facility could make one *more* vulnerable to assault, however, if these inmates hold a higher status in the population and face the risk of being challenged by others who wish to improve their own status (e.g., Irwin 1980, 2005).

The remaining background factors and gang membership were unrelated to assault odds. Victimization studies of non-prison populations often underscore the relevance of demographic and social demographic correlates to victimization risk (for examples, see Wilcox et al. 2003). Zero-order correlations (not shown) revealed significant total effects of an inmate’s race and family status on assault, but the null higher-order effects suggest that the more proximate effects on individual level victimization risk lie in other factors that are correlated with these attributes. This observation is consistent with Lynch (1987), who argued that controls for lifestyle factors may render null direct effects for demographics such as age, race and sex if the latter only proxy unmeasured (more proximate) effects on victimization risk. As in studies of non-prison populations, more direct measures of inmate lifestyles may render some of the demographic correlates of victimization nonsignificant in prison populations.

Inmate Level Effects on the Prevalence of Property Theft

Inmate Activities and Guardianship

Activities and guardianship were less relevant for predicting thefts compared to assaults, and the two significant effects in this group were opposite to those hypothesized (see Table 2). We found higher odds of theft among inmates spending *less* time in recreation and for those with *higher* custody scores. From a lifestyle perspective, more time spent in recreation should leave an inmate’s property less guarded for longer periods, potentially increasing opportunities for theft. On the other hand, if time spent in recreation included recreation hours spent in cell blocks, inmates might actually be in a better position to guard their property during this time.

In conjunction with significantly higher odds of theft among inmates with *higher* security classifications, there is no evidence to suggest that lower custody scores and greater involvement in structured activities serve to *increase* the odds of theft victimization.

Target Antagonism

In contrast to the above, indicators of target antagonism were equally relevant for predicting both thefts and assaults. Some of these effects were inconsistent with our predictions, however, based on the idea of “antagonism.” Theft odds were higher for females, inmates incarcerated for property crimes (vs. *lower* odds for those incarcerated for violence), and among those who engaged in violence while incarcerated.

Consistent with findings for assaults were the inverse effect of incarceration for violence on the odds of property theft, and the positive effect of violent misconduct while incarcerated. Although we predicted *lower* odds of theft victimization among those incarcerated for property crimes, assuming these inmates are less “antagonistic” than others, it is possible that property offenders constitute a different class of inmates who are not quite as economically disadvantaged relative to violent and drug offenders. As such, they may possess more personal property.

Violent misconduct might be linked to both assault and theft victimizations if violent behaviors reflect a more general “antagonism” in prison that place these inmates on the periphery of any network that might effectively insulate them from either form of victimization. On the other hand, committing theft while incarcerated coincided with higher odds of assault victimization but not higher odds of theft victimization. This may be due to the nature of retaliation in prison which more often comes in the form of violence as opposed to property theft, regardless of how the inmate is provoked (whether by violence or theft).

The finding of *lower* odds of theft for males relative to females does not support the idea that male inmates might be more “antagonistic” than female inmates. (Sex was also a nonsignificant predictor of assaults). This finding might have more to do with the greater extent to which female inmates borrow particular items that are never returned. In the prisons examined here, we observed a more “communal” exchange of toilet articles and certain pieces of clothing in facilities for women. This type of environment could lead to situations where women are more apt to simply take items from others’ living space without fear of repercussions.

Target Vulnerability

Indicators of target vulnerability were more relevant for predicting thefts relative to assaults. All significant effects were in the predicted directions, with higher odds of theft among white Anglo inmates (compared to both African Americans and Latinos), those more educated and those employed at arrest, non-gang members, inmates with less time spent in the present facility, and those with weaker beliefs in the legitimacy of correctional officers. Time served in the same facility was also a significant predictor of assaults but in the opposite direction, suggesting that the odds of assault versus property theft might vary inversely based on time served.

Of the individual level concepts considered here, target vulnerability may be the most applicable to an understanding of theft victimization in prison. The same cannot be

concluded for an understanding of assault victimization, for which elements of daily routines, antagonism, and vulnerability appear to be equally relevant.

Facility Effects on Assaults and Thefts

The analysis of facility effects began with an exploration of zero-order effects which, in turn, helped to target significant predictors for the multivariate analysis. These zero-order coefficients are not displayed but are discussed here.⁷

Both assault and theft levels were significantly higher in Ohio compared to Kentucky. These state differences were nonsignificant when controlling for population size, possibly due to Ohio's much larger populations which sometime exceed design capacities by a factor of two or more. (The zero-order effect of population size was significant at $p < .001$.) A positive relationship between capacity and assault levels and an inverse relationship between officer:inmate ratios and theft levels also became nonsignificant when controlling for population size.

Architectural design also appeared to influence victimization levels, in particular the telephone pole style design with primarily celled housing which positively influenced assault victimizations ($p < .01$) yet negatively influenced theft victimizations ($p < .01$). Both campus style designs (primarily cells vs. dorms) were significant predictors of theft victimizations. Including all three measures in the same model yielded significant results only for telephone pole style with primarily celled housing and campus style with primarily dorm housing. The significant effect of proportion inmates housed in dorms on theft victimizations ($p < .01$) was nonsignificant when controlling for the two significant design measures and population size.

Officer perceptions of rule under-enforcement maintained the strongest and most significant effects on both forms of victimization regardless of controls for population size and architectural design. Age of the prison, on the other hand, was not a significant predictor of either outcome ($p > .10$). These findings led to inclusion of the two design measures, population size, and officer perceptions of rule under-enforcement in the level-2 model.

Multivariate Findings for Macro-Level Guardianship

Table 3 displays the level-2 models of assault and theft victimizations. Population size and rule under-enforcement were significant in both models, with larger proportions of inmates victimized by assault and theft in facilities with larger populations and more agreement among officers that facility rules were under-enforced. Larger populations may provide more opportunities for victimization due to practical constraints on effectively monitoring all inmates. Larger populations may also coincide with higher population densities and closer proximities to larger numbers of potential offenders (similar to Wilcox et al.'s 2003 discussion of increased exposure to risky situations in more dense residential populations). Regarding rule enforcement, inmates observe the strictness of rule enforcement and may take advantage of leniency shown by officers. These findings reflect higher victimization rates in places with lower levels of guardianship.

Findings for architectural design differed across the two models. The telephone pole style with primarily cells coincided with higher levels of assaults yet lower levels of thefts whereas the campus style with primarily dorms coincided with lower levels of assaults yet

⁷ A table of the level-2 zero-order effects is available upon request from the first author.

Table 3 Level-2 intercepts-as-outcomes models of adjusted mean odds of victimization ($n_2 = 46$)

Predictors	Assaults			Thefts		
	γ	s.e. $\cdot\gamma$	e^γ	γ	s.e. $\cdot\gamma$	e^γ
Intercept	−3.45			−1.77		
<i>Guardianship</i>						
Campus style with primarily dorms	−.21 [†]	.12	.81	.34**	.11	1.38
Telephone pole style with primarily cells	.33 [†]	.20	1.39	−.16 [†]	.10	.86
Inmate population on day of survey	3.0×10^{-4} **	9.0×10^{-5}	1.0003	3.3×10^{-4} **	6.8×10^{-5}	1.0003
CO perceptions of rule under-enforcement	.92**	.29	2.50	.87**	.14	2.28
χ^2 improvement in fit over level-1 model	17.4**			40.0**		
Proportion between-facility variance explained by level-1 and level-2 effects	.84			.75		

Laplace estimation used to provide model fit statistics while providing approximations to maximum likelihood coefficients (Raudenbush et al. 2011)

[†] $p < .10$; * $p \leq .05$; ** $p \leq .01$

higher levels of theft. Both findings for theft are consistent with our hypotheses, assuming greater opportunities for theft in dormitory settings (also consistent with Morris and Worrall's (in press) finding for telephone pole style facilities). The finding of higher assault levels in telephone pole style facilities is also compatible with guardianship in that there are more blind spots in these facilities where offenders may be successful in their attacks on inmates. On the other hand, Morris and Worrall (in press) discussed how the telephone pole style offers less freedom of movement compared to dorms, and so *lower* odds of assault might be expected in those facilities. Texas prisons may differ from those examined here, however, in that we did not observe controlled (group) movement in the telephone pole style prisons. This greater freedom of movement might account for our finding. On the other hand, the inverse effect of campus style designs on assaults could reflect fewer blind spots *or* unmeasured differences in the populations of these facilities compared to others (as opposed to more effective supervision over inmates). For example, some of the campus style designs with primarily dormitory housing were pre-release facilities where low risk inmates are placed one or 2 years prior to their release. The price of engaging in violence in these facilities is transferal to a more secure prison.

Conditioning Effects of Guardianship at the Facility Level

Table 4 displays the effects of facility guardianship on the magnitude of significantly varying inmate effects on victimization. An inmate's age was the only level-1 effect on assaults that varied significantly in magnitude across facilities ($p < .05$). Variance in the age effect coincided with differences in architecture and officers' perceptions of rule enforcement. The inverse age effect (Table 2) was stronger in campus style facilities with primarily dormitory housing, and in prisons where officers were more likely to agree that

Table 4 Level-2 slopes-as-outcomes models for the prevalence of victimization ($n_2 = 46$)

Predictors	Assaults		Thefts	
	γ	S.E. γ	γ	S.E. γ
<i>Level-1 age effect as outcome</i>			n.a.	
Campus style with primarily dorms	-.03*	.01		
Telephone pole style with primarily cells	-.004	.01		
Inmate population on day of survey	3.0×10^{-6}	7.0×10^{-6}		
CO perceptions of rule under-enforcement	-.05*	.02		
<i>Level-1 African American effect as outcome</i>	n.a.			
Campus style with primarily dorms			.24 [†]	.18
Telephone pole style with primarily cells			-.04	.23
Inmate population on day of survey			2.8×10^{-5}	1.1×10^{-4}
CO perceptions of rule under-enforcement			-.11	.37
<i>Level-1 Latino effect as outcome</i>	n.a.			
Campus style with primarily dorms			-.46	.72
Telephone pole style with primarily cells			.28	.77
Inmate population on day of survey			$-1.6 \times 10^{-3**}$	5.2×10^{-4}
CO perceptions of rule under-enforcement			-1.90 [†]	1.42
<i>Level-1 prior prison effect as outcome</i>	n.a.			
Campus style with primarily dorms			-.05	.23
Telephone pole style with primarily cells			.37 [†]	.29
Inmate population on day of survey			-.0002	.0001
CO perceptions of rule under-enforcement			.19	.45
<i>Level-1 # job hours effect as outcome</i>	n.a.			
Campus style with primarily dorms			-.04	.03
Telephone pole style with primarily cells			-.05	.04
Inmate population on day of survey			-1.0×10^{-6}	2.1×10^{-5}
CO perceptions of rule under-enforcement			.08	.07
<i>Level-1 # visits effect as outcome</i>	n.a.			
Campus style with primarily dorms			.11 [†]	.07
Telephone pole style with primarily cells			.08	.08
Inmate population on day of survey			$5.9 \times 10^{-5†}$	3.7×10^{-5}
CO perceptions of rule under-enforcement			.25*	.12

[†] $p < .10$; * $p \leq .05$; ** $p \leq .01$

rules were under-enforced. Younger inmates were more likely to be assaulted in these environments. Greater freedom of movement in campus style designs might generate a stronger link between age and victimization risk due to greater opportunities to victimize younger inmates (for a discussion of the higher risk of sexual victimization among younger inmates, see Felson et al. 2012).

Different findings emerged for the prevalence of theft, where the level-1 race and ethnicity effects both varied significantly across prisons, as did the effects of prior prison sentences, time spent at jobs, and the number of visitors an inmate received during the preceding month. Even so, the effects of race, prior imprisonment, and job hours did not vary with any of the level-2 factors. On the other hand, the inverse ethnicity effect

involving lower odds of theft among Latinos (Table 2) was stronger in prisons with larger populations and in prisons where officers were more likely to perceive rule under-enforcement. An inmate's ethnicity mattered more in environments with lower levels of guardianship, suggesting that ethnic disparities in victimization experiences might be reduced with refinements to supervision and control.

Inmates with more visits during the preceding month were also more likely to be victimized by theft in prisons with less strict rule enforcement. Time away from one's property might create greater opportunities for theft in environments where officers are less strict. The effect of visitations was also stronger in campus style facilities with primarily dormitory housing, also consistent with the idea that weaker guardianship over property serves as an additional disadvantage to inmates who are removed from their housing units for longer periods of time.

These findings offer some support for the idea that weaker guardianship at the facility level might generate stronger level-1 effects on victimization, but only for particular effects (age, ethnicity, and visitations) on specific forms of victimization (assaults vs. theft). Given the sheer number of non-conditioning effects in these models, indicators of guardianship appear to matter primarily as direct rather than conditioning effects on victimization risk.

Implications and Refinement of a Bi-level Opportunity Perspective

Here we discussed and examined the applicability of a bi-level opportunity framework for understanding prisoner victimization. This perspective not only offers a more unified framework for understanding the possible relevance of many of the inmate and facility factors that have been examined in previous studies (inmate demographics, social demographics, criminal history and risk factors, and facility climate and management), it also underscores the importance of inmate routines during confinement that more directly reflect "lifestyle" factors that may influence exposure to high risk situations in prison while also providing a possible explanation for why certain effects operating at the inmate level may vary across prisons (due to differences in guardianship at the facility level).

Findings from the analysis of 5,640 inmates from 46 prisons across Ohio and Kentucky provided evidence favoring the applicability of main effects under this perspective, thus offering support for the applicability of lifestyle/routine activities theory to an understanding of victimization in the prison context. The applicability of a bi-level perspective may be limited to main effects only, however, based on limited evidence that guardianship at the facility level *conditioned* inmate level effects on victimization. Our findings also suggest that, *if* cross-level effects are relevant for an understanding of inmate victimization, these effects might be restricted to property crimes as opposed to violent crimes. Additional research on both main and cross-level interaction effects is necessary in order to verify these observations, however, and analyses of larger prison samples with additional macro level indicators of guardianship may actually provide support for the relevance of cross-level interactions. Larger prison samples would also support finer measures of architectural designs, as advocated by Morris and Worrall (in press).

A synthesis of findings leads to some refinements of the bi-level perspective in order to make it more applicable to an understanding of victimization in a prison context. First, the applicability of "guardianship" appears limited to the macro level for both types of victimization. Guardianship effects at the individual level (i.e., higher inmate custody scores and placement in segregation vs. general population) were counterintuitive in that greater

guardianship coincided with *higher* victimization odds. Unlike non-prison populations, guardianship in prison is tied directly to an inmate's risk of *offending*. Knowledge that some inmates are more heavily "guarded" might say more about the composition of the population in which an inmate is placed rather than about the level of meaningful protection provided by prison staff.

Second, inmate activities and daily routines *overall* may be less relevant than indicators of target antagonism and vulnerability to an understanding of inmate victimization. Life-style factors are often found to be significant predictors of victimization in non-prison populations (Wilcox et al. 2003), but the more restricted movement of inmates in prison may restrict the variation in daily routines necessary for significant links to victimization risk. Short of dividing the activities examined into finer groups (e.g., active vs. inactive forms of recreation), a more fruitful approach might involve expanding measures of target suitability (e.g., whether an inmate owns property considered valuable by others).

Third, the distinction between target antagonism and target vulnerability (Finkelhor and Asdigian 1996) appears useful in the prison context. Target antagonism was more important for understanding violent victimizations (based on the magnitude of the violent misconduct effect), whereas target vulnerability was more relevant to theft victimizations (based on the sheer number of significant effects, all in the predicted directions). "Vulnerability" to violence in prison may have more to do with one's placement in a social hierarchy as opposed to the background factors examined here that may or may not be related to an inmate's status. By contrast, target vulnerability may be more relevant to property theft if it encompasses indicators of both the worth of an inmate's property as well as his or her potential for retaliation. The close proximity of prisoners breeds familiarity that does not exist in non-confined populations, providing most anyone with knowledge of the more "vulnerable" targets for theft.

Finally, macro level indicators of guardianship in prison might be more relevant for explaining level-2 variance in victimization compared to multi-level studies of neighborhoods with macro level indicators of exposure to higher risk situations. We are not aware of any multi-level neighborhood study of routine activities that has uncovered a comparable estimate of explained variance at the macro level relative to our estimates. Here we found that the level-2 model explained an additional 50 % of the between-prison variance in theft victimization beyond the compositional effects, and an additional 20 % of the between-prison variance in assault victimization. Also noteworthy in this regard, the between-prison variance in both assault and theft victimizations was reduced to non-significance in each full model (with both level-1 and level-2 predictors included).

In sum, and as a possible guide for future research, our refinements suggest that a bi-level opportunity framework for understanding inmate victimization place heavier emphases on (a) "target suitability" effects overall, (b) the role of target antagonism (relative to target vulnerability) for understanding violent victimization, (c) the role of target vulnerability (relative to target antagonism) for understanding theft victimization, (d) macro-level guardianship factors including a focus on architectural design, and (e) main (relative to conditioning) effects of macro-level guardianship. These observations are based on only one study, however, and future studies may underscore a greater relevance of cross-level interactions. Future research may also reveal that certain macro level factors are important primarily as main effects whereas others are more important as conditioning effects.

The primary limitation to this study was the analysis of only 46 prisons which restricted the number of possible facility effects that could be examined, both as main and cross-level interaction effects. Nonetheless, regarding cross-level interactions, the finding that certain

inmate effects are stronger in some prisons than others suggests that particular characteristics of inmates and their daily routines might be relevant for influencing victimization risk *only* in prisons with weaker levels of facility guardianship. Evidence favoring this idea, such as the finding that the number of visits received by inmates maintained a stronger effect on theft victimizations in prisons where facility rules were under-enforced, would underscore the relevance of understanding how individual and facility characteristics interact to enhance opportunities for victimization among inmates with particular lifestyles in certain types of prisons.

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Appendix: Operationalization of Independent Variables

Indicators of inmate activities and guardianship included average number of hours per week in recreation, weekly hours in education classes and/or vocational training, weekly hours working at a job, number of visits an inmate received during the preceding month, custody level, and residence in the general inmate population. The metric scales of weekly hours in various activities, each capped at 40 h, and months served were logged (natural log) due to over-dispersion on the original scales.

Indicators of target antagonism included an inmate's sex, primary offense incarcerated for (violent or property, with drug and public order crimes as the reference), prior imprisonment for a separate offense, whether an inmate was officially charged with committing violence during the previous 6 months, and whether s/he was charged with committing theft during same period. Measures of target vulnerability included other inmate demographics (age, African American, Latino), social backgrounds at arrest (high school degree or greater, excluding GED, employment status, whether the inmate lived with dependent children), known gang affiliation(s), time served in the current facility, and perceptions of correctional officers.

Inmate perceptions of officers were operationalized as two orthogonal factors from a principal components analysis of five survey questions asking the extent to which inmates agreed that (a) Overall, the correctional officers here do a good job; (b) The correctional officers are generally fair to inmates; (c) Officers treat me the same as any other inmate here; (d) Inmates often complain about being treated unfairly here; and (e) Officers treat some inmates better than others ($KMO = .69$). Items (d) and (e) were reverse coded. Inverse relationships between these factors and victimization reflect lower victimization odds corresponding with greater officer legitimacy.

Regarding facility measures explored for the multivariate models, aside from those reflecting Morris and Worrall's (in press) recommendations (architecture, proportion inmates housed in dorms, and age of facility), we examined a few other indicators of guardianship over inmate populations. These measures included whether a facility was in Ohio or Kentucky (Ohio prisons are often crowded while all Kentucky prisons operate at capacity), design capacity, population size at time of study, ratio of officers to inmates, and a facility's average score on a factor capturing officers' perceptions of rule enforcement, with higher values reflecting more agreement that rules are typically *under*-enforced in the

facility. This measure was derived from a principle components analysis of the officer data and four items asking the extent to which they agreed that (a) The rules for inmates are under-enforced in this facility; (b) It is impossible to issue disciplinary tickets to inmates for all rule violations we are aware of; (c) The warden usually supports my decisions regarding when to issue disciplinary tickets (reverse coded); and (d) When I question inmates about a rule violation they may have committed they often verbally attack me. A single factor emerged from the analysis ($KMO = .63$). The small number of facilities ($n = 46$) restricted the number of facility measures included in the multivariate model.

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