

# Inmate Assaults on Prison Staff

## A Multilevel Examination of an Overlooked Form of Prison Violence

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Most of the extant literature on prison violence has explored inmate-on-inmate assaultive behaviors rather than inmate-on-staff assaults. In addition, the bulk of this past literature considered only one level of an analysis, the inmate or the prison, while ignoring the importance of prison context on inmate behavior. This study enhances past research by combining both inmate- and prison-level data into a multilevel model predicting the likelihood of inmate-on-staff assaults. Self-report data from more than 1,000 inmates and 30 prisons revealed that, at the inmate level, age and aggression were the most robust predictors of inmate-on-staff assaults. In terms of contextual effects, inmates housed in prisons with a greater proportion of non-White inmates and a larger staff-to-inmate ratio were more likely to assault prison staff members. Policy implications and suggestions for future research are discussed.

**Keywords:** *prison violence; inmate assaults; prison staff assaults*

Most of the prior research on prison violence coalesces the violent and general misconduct behaviors of inmates into one global variable. Although this treatment of the data has provided vital information to prison officials and policy makers, it has failed to provide correlates for specific behaviors, such as inmate assaults on staff members. It is quite possible that the predictors of inmate-on-staff assaults could vary considerably as compared with the predictors of other types of inmate assaultive behavior

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and misconduct. Hepburn (1989) has pointed out that “The very nature of the prison guard’s role—the exercise of authority over an involuntary clientele—means that prisoners and guards have a potentially fraught relationship” (as cited in Wortley, 2002, p. 117). Thus, it was the goal of the current study to explore this often-overlooked phenomenon of inmate-on-staff assaults. Moreover, it adds to existing research in this area by using multilevel modeling that simultaneously takes into consideration the impact of both inmate and prison-level variables on staff assault victimization.

The most recent Census of State and Federal Correctional Facilities by Stephan and Karberg (2003) showed that inmate assaults on staff members were up 27% from 1995 to 2000. Likewise, Useem and Piehl (2006) reported that in state prisons, inmate assault rates on staff were up as well from 1995 to 2000 (i.e., 13.2/1,000 to 15.3/1,000). Despite these increases, fewer prison staff were actually killed in such attacks (i.e., 14 in 1995 and 5 in 2000) over that 5-year period (Stephan & Karberg, 2003). Taken together, these studies indicate that assaults on prison staff are still occurring, but fewer of these attacks result in serious injury or death to correctional staff. Thus, it appears that U.S. prisons are still violent places for correctional personnel, they are not as deadly as in decades past. Combining this rise in staff assaults with ever-increasing prison populations, loss of programs, and longer mandatory sentences could create a context for more assaultive behavior on prison staff in the future. Moreover, at the highest security levels for example, supermax prisons, the prison staff member is usually the only other person in contact with an inmate. Thus, if inmates are going to lash out violently the most likely target is the prison staff member.

The majority of prior research that has examined inmate assaults on prison staff has been conducted at a single level of analysis, focusing on either individual-level staff assaults or staff assault rates of prisons. From a statistical perspective, these studies have failed to take into account the “nested” nature of inmates in prisons. Rather, they have focused on either the individual or the prison without taking the possible interaction between these two levels into consideration. To fill this gap, the current study uses multilevel statistical analysis to reveal the main effects of both individual- and contextual-level variables associated with inmate-on-staff assaults as well as the potential interaction effects between these levels. Implementing this methodological technique adds to the less-than-comprehensive understanding of inmate-on-staff assaults that currently exists.

## Literature Review

### Inmate-on-Staff Assaults: What We Currently Know

Past research that specifically examined aggression toward prison staff members is quite scarce when compared to investigations of inmate-on-inmate assaultive behavior. One study by Kratcoski (1988) explored the effects of seven factors related to assaults on prison staff. These factors were location, shift of occurrence, officer work experience, sex of the officer, age of the inmate, presence of staff during the assault, and assaults on officers after being threatened. Incident data on both minor and serious assaults were collected from one state and one federal facility. Only two variables were significant. Both age and officer experience both proved to be negatively related to inmate assaults on prison staff. A total of 75% of the assaulters in the federal prison were younger than age 25, whereas 56% of the assaulters in the state prison were younger than age 25. In addition, newer trainees were the most likely targets of inmate assault.

Another study by Light (1991) examined the motivation behind inmate-on-staff assaults. A total of 694 incident reports from 31 New York state prisons indicated that the majority of assaults on staff (26%) were random acts of violence. The second most frequent reason (13%) for assaulting a prison staff member occurred as a response to a prison officer's direct command, for example, commands to enter or leave an area, requests for prisoner identification, and so on. Another 11% of the staff assaults by inmates were categorized as protests. In these cases, the inmates felt they were treated unfairly by the prison staff member and retaliated against him or her. Other inmate-on-staff assaults resulted from person and cell searches, intervention between inmate fights, movement of inmates, and confiscation of prohibited articles from inmates. The lowest percentage of staff assaults by inmates occurred as a result of inmate emotional instability or the influence of drugs and/or alcohol.

At the macro level of analysis, Gaes and McGuire (1985) undertook a study of prison violence rates. These researchers gathered data from official reports of misconduct from 19 federal prisons. This study was unique in that it examined both inmate-on-staff weapon and non-weapon assault rates. Some of the predictor variables included: mean age of the population, preprison work experience, type of crime, previous commitment record, prior alcohol or drug use, racial composition of the population, average time remaining on inmates' sentences, staff-to-inmate ratio, and percentage of staff

who were correctional officers. Also included in the analysis were indicators of crowding, security level, turnover rates, and program participation.

The results of their analyses indicated that among all the structural variables examined, crowding (average daily population to the design capacity) was the most influential variable on staff assault rates. Crowding was significantly and positively related to inmate-on-staff assault rates both with and without a weapon. Other previous studies showed that crowding had no effect on staff assaults (Ekland-Olson, 1986; McCorkle, Miethe, & Drass, 1995; Nacci, Teitelbaum, & Prather, 1977).

In addition, Gaes and McGuire (1985) found that institutions with a greater percentage of non-White population had more inmate-on-staff assaults with weapons. Moreover, mean inmate age showed a significant negative relationship to inmate-on-staff no-weapon assaults only. Finally, prison size, total staff-to-inmate-ratio, turnover, and the average number of previous commitments had null effects on staff assault rates. In a similar vein, a British study by Ditchfield and Harries (1996) also found increases in assaults on staff as the proportion of Black inmates increased and as the mean age of inmates decreased.

McCorkle et al. (1995) also conducted a macro-level examination of staff assault rates. This study used data from more than 371 state prisons to test the effects of structural, managerial, and environmental determinants of inmate-on-staff assaults. Some of the variables examined were crowding, security level, guard-to-inmate ratio, program involvement (number of inmates involved in programs), size of the institution, unemployment rate of the community, and White-Black income ratio of the community where the prison was located. This study found that there were only three significant predictors of inmate-on-staff assault rates. They were White-Black guard ratio, program involvement, and security level of the institution. Program involvement was negatively related to assault rates, whereas White-Black guard ratio and security level were positively related to higher inmate-on-staff assault rates. Overall, this study suggested that poor prison management may promote violence in prison.

Briggs, Sundt, and Castellano (2003) conducted a more recent macro-level examination of staff assaults. These researchers examined the effects of supermax prison conditions on prison violence rates. Data from three states revealed that the highest security levels had positive, negative, and null effects on inmate-on-staff assaults. These mixed results encouraged the continued examination of security level in the current study.

Combining inmate- and prison-level variables, a study by Light (1990) examined 10 prisoner-level variables and 25 contextual (prison) variables

as predictors of the *severity* of assaults on prison staff across 15 prisons and 471 prisoners. Prisoner variables included age, race, criminal history (crime type, seriousness of crime, drug abuse history, recidivism, and previous arrests), time served, and sentence length. Prison-level variables included aggregate measures of the prisoner-level variables plus information on crowding, correctional staff, size of the institution, inmate satisfaction or dissatisfaction, and correction officer satisfaction or dissatisfaction.

Light's (1990) findings indicated that prisoner-level characteristics had little effect on the severity of assaults on staff. More important, the author suggested "the severity of reported assaults is in large part determined by attributes of the prison environment rather than by prisoner characteristics" (Light, 1990, p. 281). This research showed that once the inmate got involved in an assaultive incident the prison characteristics (contextual factors) were the most important predictors of assault severity not the prisoner-level characteristics. Even when prisoner-level age was controlled for, it was the aggregate measure of mean inmate age that had the most robust effect on inmate assaultive behavior.

Harer and Steffensmeier (1996) also examined the effects of inmate- and prison-level variables on prison violence. They examined disciplinary hearing reports from 58 federal prisons. Their study found that once all of the inmate and structural variables were entered into a model that Black inmates, inmates with a determinate sentence, and inmates with a history of violence were more likely to engage in prison violence. Also, inmates who were older and who maintained outside relationships were less likely to engage in prison violence. At the contextual level, Southern prisons and higher security prisons experienced more prison violence.

Although informative, Harer and Steffensmeier (1996) conceptualized prison violence with only one variable consisting of both inmate assaults on prison staff and inmate assaults on other inmates. Thus, the sole correlates of inmate-on-staff assaults were not parceled out uniquely.

A recent study by Jiang and Fisher-Giorlando (2002) tested the efficacy of more than 25 prison-level, prisoner-level, and situational variables in explaining inmate-on-staff assaults. The authors examined 431 disciplinary reports involved in both violent and nonviolent assaults against prison staff. It was found that, inmates serving longer sentences were less likely to assault prison staff. Also, inmates were more likely to assault unmarried correctional officers than married correctional officers. More assaults on correctional staff took place in lock-down units and in cells rather than in other locations in the prison. Finally, fewer staff assaults took place during the inmate's free time or work time than during movement time. All in all,

this study indicated that situational predictors were the most useful in predicting inmate-on-staff assaults.

### **Inmate-on-Staff Assaults: What the Current Study Adds**

Three conclusions can be drawn from the existing literature: (a) there is a significant lack of research regarding inmate-on-staff assaults, (b) the studies that do exist were usually conducted at either the micro level (prisoner) or the macro level (prison) while ignoring the influence of prison context on individual behavior, and (c) the few studies that did employ multilevel modeling relied solely on traditional ordinary least squares (OLS)/logistic regression techniques, making their findings somewhat problematic. These traditional techniques ignored the nested nature of inmates in prisons. By employing the latest multilevel logistic regression techniques, the current study is able to examine prison structural characteristics and individual-level characteristics simultaneously to see how they affect individual violence.

## **Methods**

### **Data**

The data for this study came from various sources. The Level-1 data (information about inmates) came from self-report surveys, which were administered to 1,054 inmates in 30 prisons across three states (Kentucky = 11, Tennessee = 8, and Ohio = 11). Self-report questionnaires, rather than incident reports, were used because disciplinary reports have the potential of being biased or problematic. Reisig (1998) suggested that a large amount of prison misconduct goes unnoticed by prison staff. Likewise, some of the incidents between correctional officers and inmates were simply ignored and went unreported by correctional staff. Woolredge (1998) implied that some correctional personnel were unwilling or unmotivated to report inmate deviance given the characteristics of the inmates involved. Additionally, prior literature using disciplinary reports to ascertain assault information typically obtained data from prisons in only *one* state or the federal prison system. Given this, their disciplinary were uniform in nature. In opposition, the current study collected data across *several* states. Unfortunately, there was much inconsistency between the states' incident reports, as to the format and information collected on these instruments.

Therefore, the author opted for self-report surveys rather than incident reports. Also of interest, is that some of the state disciplinary reports did not contain all of the inmate-level variables required by the author for this analysis, such as number of visits, aggression level of the inmate, or prior violent history. Although self-report data does have obvious drawbacks, there has been no definitive research indicating that self-report surveys from inmates are any more or less valid than prison disciplinary reports when assessing inmate misconduct. This research adds to the continuing debate.

Besides self-administered questionnaires, Level-2 data (information about prisons) came from each state's Department of Correction or from prison officials during the time of survey administration. All of the data were collected in 2001.<sup>1,2</sup>

## **Sampling**

At the macro level, Kentucky volunteered all 11 of their men's prisons for research. In Ohio and Tennessee, 11 prisons and 8 prisons, respectively, agreed to be included in the research. In Kentucky and Tennessee, the Departments of Correction generated a list of inmates who had resided at each facility for at least 6 months. This time restriction was necessary as it was important to gather inmates who had had time to absorb prison context. The size of the sampling frames for each prison varied anywhere from 33 to more than 2,000 inmates. From these lists, inmates were randomly selected, via systematic random sampling, for inclusion. No more than 400 inmates were included from the larger facilities. At some of the smaller facilities, all inmates were selected for study. Inmates were then sent recruitment letters asking for their participation in the survey. In Ohio inmate lists were unable to be generated, so inmates were recruited via use of sign-up sheets placed in common areas like dorms and day rooms, in each of the prisons. The final number of inmates who participated in the survey from each of the states was Ohio, 366; Tennessee, 300; and Kentucky, 388.

## **Measures of Variables**

The key micro-level dependent variable for this project was inmate-on-staff (nonserious or nondeadly) assaultive behavior. Each inmate was asked to report if they had engaged in an assault (physical attack with force that did not result in serious injury or death) on a prison staff member in the past 12 months. The response categories formed a dichotomous variable with attributes

**Table 1**  
**Variables and Descriptive Statistics**

	<i>M</i>	<i>SD</i>	Range
Dependent variable			
Inmate-on-staff assault	0.04	0.19	0-1
Explanatory variables			
Age (inmate characteristics)	35.89	10.02	18-71
Race	0.44	0.50	0-1
Violent offense	0.67	0.47	0-1
Prior violence	0.26	0.44	0-1
Time served	7.33	5.94	0.16-0.54
Time served squared	89.09	161.44	0.03-2916
Sentence length	22.94	23.91	0.50-263
Visits	2.73	1.56	1-5
Aggression	11.23	3.35	4-20
Security level (prison characteristics)	0.13	0.35	0-1
Programs	8.10	4.16	2-18
Custodial staff/inmate ratio	0.22	0.07	0.22-0.48
Crowding	1.00	0.11	0.83-1.39
Proportion non-White	0.43	0.13	0.08-0.67
Proportion younger than age 25	0.18	0.10	0.06-0.51
Population size	1372.25	586.52	190-2281

Note: The total sample size is 1,054 inmates and 30 prisons.

0 = *no* and 1 = *yes*. Table 1 reveals that 4% of the sample inmates engaged in an assault on a staff member.

*Micro-level variables.* The individual-level explanatory variables consisted of measures used in prior research that have shown to be strong predictors of violent behavior or misconduct (e.g., Ellis, Grasmick, & Gilman, 1974; Flanagan, 1983; Harer & Steffensmeier, 1996; Kratcoski, 1988). Age was measured as a continuous variable by asking inmates to report their current age in years. As Table 1 indicates, the average age of inmates in the sample was 35.89 years. Race was measured as a dichotomous dummy variable 0 (*White*) or (1) *non-White*. According to Table 1, on average across prisons 44% of the sample was non-White.

Current violent offense was also measured with a single dummy variable. Inmates were asked if they were currently serving time for a violent offense (0 = *no*; 1 = *yes*). Table 1 shows that 67% of the sample were currently

serving time for a violent offense. In comparison, 44% of the 1.3 million state prisoners across the United States in 2001 were serving time for a violent offense, 18% were serving time for a drug offense, 19% for property offenses, and the remainder were incarcerated for other offenses (Beck & Harrison, 2002). All in all, the data for the current study shows that violent offenders were overrepresented in the sample when compared to violent offenders nationally. Of the violent offenders in this sample, more than 50% were serving time for robbery. It is sufficient to say that the current sample overrepresents violent inmates even though all attempts were made to get as random of a sample of inmates as possible.

The final dummy variable at the inmate level was history of prior violent criminal behavior. This variable was measured by asking inmates if they had ever served time for a prior violent offense. Table 1 shows that 26% of the sample had served some time for a prior violent offense.

Other variables such as sentence length and time served were measured as continuous variables. Table 1 shows that the average sentence length was 23 years and the average time served for this sample was about 7 years. Time served squared was also included as a control variable to test for a possible curvilinear effect. The overrepresentation of violent inmates in this sample accounts for the increased sentence length and time served. For example, in the current study, the average time served (8.61 years) and sentence length (27.78 years) for current violent offenders was much higher than that for property offenders (5.86 and 15.16 years), drug offenders (4.23 years and 12.04 years), and other offenders (5.68 and 14.58 years) offenders. Again, it is important to reiterate that the sample overrepresents violent inmates even though all attempts were made to get a random sample. As is often the case, prison sampling was limited to those inmates who are available and allowed to participate on the day of data collection. Thus, the findings of this study are generalizable only to the inmates in the sample and not to the population of inmates across the country.

To determine the status of each inmate's outside relationships, the respondents were asked how often they had received visits from family and friends during the past twelve months. Aday and Webster's (1979) model of institutional dependence was used to create a scale of 12 ordinal categories ranging from never to more than 12 times. As Table 1 shows, the mean frequency of visits was 2.73, which is between the categories one to two times and three to six times in the past year.

The final individual-level variable was a control variable for aggression. This variable was included because past research indicated that personality

and emotional stability were significant predictors of violent behavior during incarceration (Adams, 1983; Toch & Adams, 1986; Wright, 1991). Buss and Perry (1992) developed the rating scale used here to measure aggression. The initial scale was 16 items long and contained 4 subscales or aggression factors: physical aggression, verbal aggression, anger, and hostility. Given the space constraints of this survey, only one item from each subscale was included. Inmates were asked to describe how characteristic it was for them to engage in certain aggressive behaviors. Ratings ranged from 1 (*very much unlike me*) to 5 (*very much like me*). The indicators were combined into one aggression scale with an alpha reliability of .63. Table 1 reveals that the average aggression score was 11.22 with a low score of 4 and a high score of 20.

*Macro-level variables.* At this level, the following variables were included in the analysis because they were used in previous research as correlates of inmate violence rates. Security level was measured with a dichotomous dummy variable with 0 = *nonmaximum* and 1 = *maximum*. As Table 1 indicates, on average 13% of the prisons in the sample were maximum-security institutions. Crowding was measured by dividing the average daily population by the institution's operational capacity. According to Table 1, the mean crowding ratio of 1.00 indicates that the prisons in the sample were not overcrowded. Rather, most of the sample prisons were at capacity.

Akin to crowding, population or size of each institution was also measured. This variable has typically been used in past research as structural/management-style control variable (McCorkle et al., 1995). As Table 1 shows, the average population across these institutions was about 1,300 inmates. Institutional populations ranged from 190 to more than 2,200.

Also examined was the custodial staff-to-inmate ratio. This variable was ascertained by dividing the total number of correctional (custodial) staff, not the total number of all staff, by the inmate population. Table 1 shows that the mean custodial staff-to-inmate ratio across prisons was 0.22, which is similar to saying for every five inmates there is one custodial staff member. Finally, the combined number of vocational and educational programs was measured as a continuous variable. The recent work of French and Gendreau (2006) showed that inmates who participated in programs had lower rates of prison misconduct. According to Table 1, the average number of combined educational and vocational programs across prisons was 8.10.

The final two structural variables were proportion non-White and proportion of inmates younger than age 25. Table 1 indicates that on

**Table 2**  
**Null Model for Inmate-on-Staff Assaults (Nonserious/Nondeadly)**

Fixed Effects	Coefficient	SE
Level 1		
Mean log odds of staff assault	-3.222	0.226*
Random Effects		
	Variance Component	z-Score
Level-2 variance (prison-level error) (Mean assaults)	0.695	1.980*
Level-1 variance (inmate-level error) (Level-1 extra binomial error)	0.987	22.953*

Note:  $n = 1,054$  at the individual level;  $n = 30$  at the prison level.

\* $p < .05$ .

average across prisons, the proportion of non-White inmates is 0.43 (43%) and the proportion of inmates younger than age 25 is 0.18 (18%). Interestingly, the proportion of young inmates in the sample prisons ranged from 0.06 to 0.51.

## Analysis and Results

The first step of multilevel modeling involves creating a null model. The result of this model reveals whether or not the dependent variable, inmate-on-staff assaults, varies across the sample prisons. Specifically, Table 2 shows that the variance component for mean level of assaults on staff (intercept = 0.695) is significant ( $z = 1.980$ ) suggesting that inmate-on-staff assaults do vary across prison contexts. This finding justified the use of multilevel modeling.

Next, a random-coefficient regression model was estimated in Table 3. The objective of the random-coefficient regression model is to determine whether or not inmate-level coefficients, ( $\beta_{ij}$ s) varied across the 30 sample prisons. In other words, does the relationship between inmate-level variables (age, race, aggression, etc.) and assault likelihood vary across prisons? Presented in Table 3 are the results from the reduced random-coefficient regression model. In this case, all of the inmate-level coefficients had insignificant variation across prisons. So, they were specified as fixed at Level 2. On completion of this step, the Level-1 and Level-2 models were specified as

$$\begin{aligned}
\text{Logit}(\text{STAFFASSLT}_{ij}) = & \beta_{0j} + \beta_{1j}(\text{Age})_{ij} + \beta_{2j}(\text{Race})_{ij} \\
& + \beta_{3j}(\text{Violent Offense})_{ij} \\
& + \beta_{4j}(\text{Time Served for Prior Violent Offense})_{ij} \\
& + \beta_{5j}(\text{Time Served})_{ij} + \beta_{6j}(\text{Time Served Squared})_{ij} \\
& + \beta_{7j}(\text{Sentence Length})_{ij} + \beta_{8j}(\text{Visits})_{ij} \\
& + \beta_{9j}(\text{Aggression})_{ij} + \dots + e_{ij}
\end{aligned} \tag{1}$$

The Level-2 model looked as follows:

$$\begin{aligned}
\beta_{0j} &= \theta_{00} + U_{0j}, \\
\beta_{kj} &= \theta_{k0} \quad \text{for } k = 1, \dots, 9
\end{aligned} \tag{2}$$

As the random-effects panel of Table 3 suggests, the variance component for the intercept or constant term (the mean log odds of assault) did decrease from its original value in the null model from 0.695 to 0.418. This is a 40% decline in the Level-2 variance for the intercept ( $1 - [0.418/0.695] \times 100$ ). There were no estimated variance components in the random-effects panel of Table 3 for any of the inmate-level coefficients from the Level-1 model because all of them were specified as fixed across prisons.

The fixed-effects portion of Table 3 shows the main effects of all of the inmate-level explanatory variables on the individual log odds of committing an assault on a prison staff member. As is usual in logistic regression analyses, the exponentiated coefficients are subject to interpretations in terms of odds ratios, which are more readily understandable than the coefficients themselves. From Table 3, age, aggression, and time served squared appear to be the only variables to have a significant effect on the log odds of an inmate assaulting a prison staff member. As inmates get older (by 1 year) they have 8% ( $[1 - \text{Exp. } B] \times 100$ ) or  $[1 - 0.920] \times 100$ ) lower odds of assaulting a prison staff member. Also, as an inmate's aggression score increases by one unit he has 18% greater odds of assaulting a prison staff member. Finally, the significance of the quadratic term (time served squared) suggests the presence of a curvilinear relationship. With every unit increase in time served (for each year served) the slope or its effect increases significantly. In terms of imagery, this relationship would start out as a relatively flat line and then slightly begin to curve upward for each additional year served. Imagine the right-hand side of a "U."

The next step in the estimation process was to run a contextual model, which assessed the main effects of Level-2 (prison) variables, while

**Table 3**  
**Random-Coefficient Regression Model for**  
**Assaults on Staff (Nonserious/Nondeadly)**

Fixed Effects	Coefficient	SE	Exp. (Coefficient)	<i>t</i> Ratio <sup>a</sup>
Mean log odds of assault	-3.728	0.301	0.024	12.385*
Age	-0.085	0.025	0.920	3.400*
Race	0.381	0.357	1.464	1.070
Violent offense	-0.029	0.388	0.971	0.075
Time served (prior violent)	0.301	0.372	1.351	0.809
Time served	0.000	0.009	1.000	0.000
Time served squared	0.002	0.001	1.002	2.000*
Sentence length	0.000	0.000	1.000	0.000
Visits	-0.074	0.112	0.929	0.661
Aggression	0.164	0.054	1.178	3.037*
Random Effects	Variance Component	<i>z</i> Score		
Mean log odds of assault (prison-level error)	0.418	1.300		
Level 1 extra binomial error (inmate-level error)	0.975	22.670*		

Note:  $n = 1,054$  at the individual level;  $n = 30$  at the prison level.

a. *t* Ratios are based on full estimates for coefficients and standard errors. Estimates provided here.

\* $p < .05$ .

controlling for Level-1 (inmate) variables.<sup>3</sup> This step of the multilevel modeling adds to the past literature on prison violence, which typically analyzed only one level, either inmate or prison analysis, while ignoring the other. Some contextual models may also contain interaction terms, such as age  $\times$  crowding or race  $\times$  security level. Because none of the variance components for individual-level variables in the Level-1 model were significant, no interaction terms were computed. Therefore, Level-2 variables were entered into the model to try to account for the variation in the average log odds of an inmate committing an assault on a prison staff member. In terms of Level-2 multilevel hierarchical modeling notation, forming a full contextual model corresponds to combining prison-level specification with that of Equation (1) at the individual level. Two significant contextual variables emerged, thus the final Level-2 contextual model was specified as

**Table 4**  
**Effects of Contextual Variables for Assaults**  
**on Staff (Nonserious/Nondeadly)**

Fixed Effects	Coefficient	SE	Exp. (Coefficient)	t Ratio <sup>a</sup>
Mean log odds of assault	-3.904	0.263	0.020	14.844*
Staff/inmate ratio	3.783	1.770	43.948	2.137*
Proportion non-White	4.593	1.570	98.790	2.925*
Age	-0.077	0.025	0.926	3.080*
Race	0.195	0.364	1.215	0.536
Violent offense	-0.107	0.383	0.899	0.279
Time served (prior violent)	0.331	0.368	1.392	0.899
Time served	0.000	0.000	1.000	0.000
Time served squared	0.002	0.001	1.002	2.000*
Sentence length	0.003	0.008	1.003	0.375
Visits	-0.076	0.113	0.927	0.673
Aggression	0.170	0.055	1.185	3.091*
Random Effects	Variance Component	z Score		
Mean log odds of assault (prison-level error)	0.073	0.399		
Level 1 extra binomial error (inmate-level error)	0.973	22.630*		

Note: v = 1,054 at the individual level; n = 30 at the prison level.

a. t Ratios are based on full estimates for coefficients and standard errors, not rounded. Estimates provided here.

\*p < .05.

$$\beta_{0j} = \theta_{00} + \theta_{01}(\text{Custodial staff to inmate ratio}) + \theta_{02}(\text{Proportion non-White}) + U_{0j},$$

$$\beta_{kj} = \theta_{k0} \quad \text{for } k = 1, \dots, 9 \tag{3}$$

Results for the full contextual model are presented in Table 4. By looking at the random-effects panel first, it is evident that the contextual variables are successful in further reducing the variance component (0.418 to 0.073) associated with the average log odds of an inmate committing an assault on a staff member by almost 83%. Comparison of the variance component for mean log odds of assault across Tables 2, 3, and 4 (0.695, 0.418, 0.073, respectively) suggest that the Level-2 variables account for most of

the variation in the mean occurrence of assaults on staff across the sample prisons. Though close to 1.0, the significance of the Level-1 extra binomial error term indicates that unexplained heterogeneity still remains at the individual-level.

The fixed-effects portion of Table 4 provides some evidence as to which contextual variables are most important in accounting for the reduction in variation in the log odds of a staff assault occurring. The staff-to-inmate ratio variable and the proportion of non-White inmates are the only statistically significant contextual effects. As the staff-to-inmate ratio and the proportion non-White prisoners increases by one unit, an inmate's log odds of assaulting a prison employee increases significantly.

The individual-level effects shown in Table 4 are very similar to those in Table 3. Controlling for prison contextual factors, age and aggression continue to have significant effects on inmate assaults. Younger inmates and more aggressive inmates have greater log odds of assaulting prison staff members, even when controlling for prison context. Also, the quadratic term for time served continues to have a positive effect on the likelihood that inmates will assault a prison employee, net of all contextual variables.

## Discussion

Overall, this study has made some contributions to our understanding of inmate-on-staff assaults. First, inmate age and aggression maintained their significance even when prison-level variables were taken into consideration. This suggests that, despite the harshness of prison context, assaults on staff are still very personal and psychological in nature. The importance of individual-level age may force prison officials to rethink the current policies regarding the placement of juveniles in both adult and youth facilities. Placing younger inmates in either adult prisons or juvenile correctional facilities seems to create a more violent atmosphere for prison staff. Prison officials may be forced to track the number of young inmates that they place in both types of facilities with the hopes of maintaining staff safety. Also, overly aggressive inmates may require more secure settings. Prison officials may also need to develop new classification instruments that seek to measure an inmate's individual aggression, as it appears to be a significant factor contributing to inmate assaultive behavior.

The significance of the time serve squared variable, although only contributing a slight increase in assault likelihood, also adds to our knowledge of prison violence. This finding suggests that the likelihood of an

inmate assaulting a staff member increases as the inmate nears the end of his or her sentence. This begins to contradict the idea that long-term inmates just “settle in for the long haul” and engage in less misconduct. That notion may hold true for the middle part of their sentence, but not as the inmate gets closer to release. Some inmates may be so accustomed to institutional life that engaging in an assaultive behavior prior to release may be a way for them to add time onto their sentence, thus avoiding the harsh reality awaiting them outside of prison. Prison officials may want to increase reentry/prerelease training programs near the end of an inmate’s sentence, not only to keep the inmate busy but also to foster a smoother transition to the outside world.

The lack of significance for the other individual-level variables in the full contextual model is also of interest. The null effects of race, prior violence, and current violent offense indicate a lack of support for the idea that prisoners who were violent outside of prison will be violent towards staff on the inside of prison (importation theory). Moreover, the lack of significance for time served, program involvement, and number of visits indicates a lack of support for the deprivation theory of prison violence. It appears that having fewer or greater of these opportunities in prison does not affect the likelihood that an inmate will assault a prison staff member. This calls into question those who suggest that prisons are “deprived” environments that promote violence. This raises important questions regarding the actual negative effects of mandatory sentencing and recent policies that cut inmate programming opportunities.

In terms of contextual effects, the significance of staff-to-inmate ratio and proportion of non-White inmates suggests that prison context can affect individual inmate behavior. That finding, in and of itself, adds to the prison violence literature, as past research did not test for the effects of prison context upon individual behavior. Rather, it focused on the effects of prison variables upon macro-level violence rates. This could possibly make the appropriate placement of inmates in prisons a much longer, more tedious process than that which currently exists. To keep prison staff safe, officials will need to play closer attention to the actual balance of guards to inmates and the racial composition of their inmate populations.

Despite these contributions, this project does suffer from some limitations and its findings should be viewed with caution. First, the sample institutions were in close geographic location to one another, so the results are not generalizable to other prisons across the country. It is quite possible that regional differences between prison contexts may exist, thus examination of more contexts are needed to verify specific differences.

The final sample of inmates was also problematic. As is typical with prison research, not all inmates were given the opportunity to participate. Some inmates were simply not allowed to participate because of safety risks, etc. Some of the most violent inmates were not included, because they were in segregation at the time. Thus, this research may not accurately reflect the “real” violent prison inmate, but rather the more motivated, bored, or opportunistic inmate in the general population who chose to take the survey.

This sample was clearly overrepresented with violent offenders (67%) who in turn, were serving very long sentences. Recent research by Jiang and Fisher-Giorlando, (2002) suggested that inmates who served longer sentences engaged in less violent misconduct. This overrepresentation of violent inmates, with their longer sentences, could have accounted for the low incidence of violence among the sample inmates in this study. However, the significance of the time served squared variable indicated that inmate behavior changes as inmates near the end of their sentences. Future research should try to secure a more representative sample to see if this new relationship holds up. The results of this research extend only to those subjects under investigation and not to the rest of the American prison population.

Despite its limitations, this research serves as a beginning for future multilevel work on prison violence. First, this project needs to be expanded to different parts of the country and include as many more inmates and prisons as possible. Examining more prison contexts will contribute to a better understanding of the interactive effects between individuals and context. In addition, future studies on inmate assaults should be expanded to women inmates. Women’s prisons present a very different context for examination. Regarding misconduct, the conditions of women’s prisons have been practically overlooked because women tend to engage in less violent behavior than males (Harer & Langan, 2001). As the context of women’s prisons continues to change, in the form of more crowding, loss of programs, and so on, then women inmates may alter their behavior in response to changing prison environments.

This study provides an impetus for future researchers to include more Level-1 and Level-2 variables in their analysis. Variables such as inmate attitudes and beliefs, gang presence, the availability of other types of rehabilitation programs, participation in prison programs, prison architecture, housing design, and prison staff characteristics (age, race, gender), may influence inmate-on-staff assault as well. Many of these additional management-style variables were omitted from this analysis as increasing

the number of variables in multilevel models, given the small number of Level-2 units, increases the chances of statistical errors. In sum, the continued use of multilevel analysis is needed to develop a more complete understanding of inmate violence than what currently exists.

Finally, future research on inmate deviance needs to start combining self-report measures with other measures of assaults, such as incident reports or data from a sample of correctional personnel. This change will serve to increase the reliability and validity of the data involved, and help prison officials implement realistic policies to keep correctional personnel and inmates safe. Studies seeking information from correctional staff about issues such as inmate threats, safety issues, severity of injury, reporting or lack of completing incident reports, and so on are long overdue. Also of import are studies examining the relationship between prison context and the well being of correctional officers not just inmates.

The results of this study have begun to show penologists that explaining inmate-on-staff assaults from one level of analysis does not provide the most accurate picture. Simply put, not all types of prison misbehavior should be collapsed into one "global" violence variable, but rather should start to be examined separately. The causes of misconduct and violent behavior, whether they be inmate-on-staff, inmate-on-inmate, or staff-on-inmate, deserve their own special attention as the correlates of each can be very different. Prison researchers who study prison violence must collect more data on both the inmate and the context in which the inmate resides. This will make data collection for prison researchers much more time and labor intensive because they will need to collect information from multiple sources of data, more inmates, and several prisons. Although there were no significant multilevel effects in this study, prison researchers will need to continue to employ multilevel techniques to analyze their prison violence data because single-level analyses mask the crucial interplay between inmate and prison context. The excuse that all prisons are equally "bad" no longer can be used as a valid reason to ignore the importance of prison context upon inmate-on-staff assaults.

## Notes

1. Missing data were substituted for with the appropriate measure of central tendency. All variables were centered on their grand means.

2. Bivariate correlations were obtained for all levels of independent and dependent variables. None of the correlations were greater than .50. Also, variance inflation factors were less than 4; thus, indicating that multicollinearity was not an issue.

3. To test for the stability of Level-2 coefficients, Level-2 variables were entered into this model alone as well as in pairs. The coefficients for the variables indicated as significant remained stable throughout this process.

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