Intelligence xxx (2012) xxx–xxx

Contents lists available at SciVerse ScienceDirect

Intelligence

journal homepage:

Individual and group IQ predict inmate violence

Brie Diamond *, Robert G. Morris, J.C. Barnes

University of Texas at Dallas, United States

ARTICLE INFO

Article history:
Received 28 March 2011
Received in revised form 26 December 2011
Accepted 24 January 2012
Available online xxxx

Keywords:
Corrections
Prison misconduct
Multilevel modeling

ABSTRACT

There is a long tradition of theoretical and empirical research linking intelligence to criminal activity. At the same time, the extant literature has been slow to examine this relationship in other settings. One such setting in which this relationship may also manifest is the prison environment, where knowledge on the determinants of prison misconduct has important implications for prison management and security. Drawing from a representative sample of inmates from a large Southern state in the US, the current study presents the first assessment of the relationship between intelligence and prison misconduct. The effect of intelligence, measured via the WAIS-R, on violent prison misconduct is analyzed controlling for inmate and prison-level factors. Results indicated that the individual's IQ, as well as the average IQ of the prison unit, was significantly and negatively related to violent prison misconduct. Implications and directions for future research are highlighted.

© 2012 Elsevier Inc. All rights reserved.

1. Introduction

Control of prison misconduct, especially violent misconduct, is integral to the overall safety and security of penal institutions. Over time, researchers have identified several important correlates of such behavior (see Camp, Gaes, Langan, & Saylor, 2003; Wooldredge, Griffin, & Pratt, 2001). While the influence of cognitive ability on prison misconduct has been proffered as an important factor (see Adams, 1992; Camp et al., 2003), no study to date has examined this relationship. Cognitive ability, often measured by IQ score, shows a consistent negative effect on criminal involvement (for a review see Hirschi & Hindelang, 1977; Moffitt, 1990; McGloin & Pratt, 2003); therefore, it is likely that a similar relationship may exist in the prison environment, which surprisingly has not been investigated.

2. IQ and crime

There are three different, though interconnected, lines of research that have linked IQ to criminal activity. First, much research has explored the link between IQ and crime among the general (i.e., non-incarcerated) population (Moffitt, Lynam, & Silva, 1994; Wilson & Herrnstein, 1985). Hirschi and Hindelang (1977) assessed the state of the literature in 1977 and concluded that IQ was a powerful individual-level predictor of criminal behavior. A longitudinal study of high-risk Danish males revealed that individuals with high IQ were "protected" from criminal involvement (Kandel et al., 1988). McGloin and Pratt (2003) reported that individuals with lower levels of IQ tended to have longer criminal careers characterized by an earlier onset of offending. Similar results were reported by Piquero and White (2003).

A second line of inquiry has directly examined IQ scores among samples of known offenders. This research has shown that offenders score approximately 8 points lower, on average, on standard IQ tests as compared to the general population (Herrnstein & Murray, 1994; Wilson & Herrnstein, 1985; Wolfgang, Figlio, & Sellin, 1972). Herrnstein and Murray (1994) reported that White males who had been sentenced to a correctional facility had an average IQ of 93, roughly 7 points lower than the population average.

A third stream of evidence flows from macro-level research. To be specific, there is a wealth of research linking macro-level IQ scores with local crime rates (Bartels, Ryan, Urban, & Glass, 2010; McDaniel, 2006; Pesta, McDaniel, &

* Corresponding author at: Program in Criminology, University of Texas at Dallas, Richardson, TX 75080, United States.
E-mail address: Diamond@utdallas.edu (B. Diamond).

0160-2896/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.intell.2012.01.010

Bertsch, 2010; Templer & Rushton, 2011). Rushton and Templer (2009), for example, showed that nations with higher average IQs exhibit lower rates of violent crime. Another example comes from a study of county-level crime rates and the prevailing average IQ levels in those counties. Drawing on a nationally representative sample of adolescents, Beaver and Wright (2011) reported that county-level IQ was strongly negatively correlated with county-level crime rates.

Taken together, the literature suggests that IQ – at the individual and macro-level – is negatively correlated with crime and this effect remains after controlling for possible confounds such as age, race, gender, and socioeconomic status (Herrnstein & Murray, 1994; Lynam, Moffitt, & Stouthamer-Loeber, 1993; Moffitt, Gabrielli, & Mednick, 1981; Wilson & Herrnstein, 1985; Wolfgang et al., 1972). This had led some scholars to investigate the underlying processes that lead from IQ to criminal behavior (Herrnstein & Murray, 1994; Moffitt et al., 1994; Wilson & Herrnstein, 1985). Scholars have attributed the association between IQ and crime to a detection effect (Murchison, 1926; Sutherland, 1931), arguing that criminals of lower intelligence are more likely to be caught by authorities. This claim, however, has failed to hold up to empirical scrutiny (Herrnstein & Murray, 1994). For instance, Moffitt and Silva (1988) found no significant differences in IQ score between offenders who were known and unknown to law enforcement. These findings suggest that IQ is not related to the risk of criminal apprehension and provides support for the use of official reports in studying IQ (i.e., official records are unlikely to be biased toward criminals of lower intelligence due their greater likelihood of apprehension).

In sum, although there is a link between cognitive abilities and criminal activity, no research has examined the impact of IQ on prison misconduct. This neglect is unfortunate given that prior researchers have focused on samples of known offenders and even samples of known recidivists (e.g., Goring, 1913; Wolfgang et al., 1972). The present study attempts to fill this gap in the literature by assessing the impact of IQ on violent prison misconduct. Before reviewing our analytic strategy and study findings, we provide a brief review of the research on prison misconduct.

3. Theories and correlates of violent prison misconduct

There are three hypotheses that have been set forth to explain and organize research on inmate misconduct: the situational perspective, the importation perspective and the deprivation perspective. Each perspective represents a different form of influence over an inmate that can be said to increase the likelihood of prison misconduct. As Wooldredge (2003) explains, each of the three perspectives must be considered in tandem so as to explicate the reciprocal relationship between them. As will be discussed below, the impact of IQ score on prison misconduct most likely operates within the importation and deprivation perspectives.

3.1. The situational perspective

The situational perspective of prison misconduct focuses on the dynamic factors of prison life that may be present during any given misconduct incident. Situational explanations of misconduct suggest that the specific context in which an event occurs may be more important than stable inmate characteristics. Certain areas of prisons seem to promote violent misconduct more than others: incidents occur most often in places of unstructured congregation such as work and recreation areas (Jiang & Fisher-Giorlando, 2002; Steinke, 1991). Further, Steinke (1991) uncovered a relationship between ambient temperature and violent misconduct, with incidences more likely to occur during times of high temperatures. Situational factors such as these may create environments favorable to aggression, resulting in violent misconduct.

3.2. The importation perspective

The importation perspective posits that misconduct occurs due to individual characteristics that inmates possess prior to their incarceration (Irwin & Cressey, 1962). In this sense, inmates are viewed as "importing" their individual traits into the prison environment. Demographics, social status, criminal background and a variety of learned behaviors and attitudes follow an individual into prison and influence his/her involvement in misconduct. The literature has consistently revealed, for example, that inmates entering prison at a younger age are more likely to commit violent prison misconduct as compared to older inmates (Berk, Kriegler, & Baek, 2006; Camp et al., 2003; DeLisi, Berg, & Hochstetler, 2004; Gendreau, Goggin, & Law, 1997; Sorensen & Wrinkle, 1996; Wooldredge et al., 2001).

Minority status has been linked with a prisoner's risk for violent misconduct (Ellis, Grasmick, & Gilman, 1974; Flanagan, 1983; Myers & Levy, 1978; Petersilia & Honig, 1980; Ramirez, 1983; Sorensen & Wrinkle, 1996; Wooldredge et al., 2001). Similarly, the influence of serving a sentence for a violent offense (DeLisi et al., 2004; Gendreau et al., 1997; Porporino, 1986; Sorensen & Cunningham, 2010; Wooldredge et al., 2001) appears to be relevant. Research also suggests that married inmates are less likely to be involved in misconduct (Jiang & Winfree, 2006; Myers & Levy, 1978). Interestingly, mixed findings surround the effect of educational attainment on violent misconduct (Cao, Zhao, & Van Dine, 1997; Cunningham & Sorensen, 2006a). A final predictor of violent misconduct related to the importation model concerns the effect of prior incarceration. Some have reported that prior incarcerations increased the likelihood of misconduct (Cunningham & Sorensen, 2006a; 2007; Griffin & Hepburn, 2006; Jiang & Winfree, 2006; Lahm, 2008; Sorensen & Pilgrim, 2000; Wooldredge et al., 2001) while others have found a negative or null effect for certain types of inmates (Cao et al., 1997; Morris, Longmire, Buffington-Vollum, & Vollum, 2010; Wolfgang, 1961; Wooldredge, 1994).

As can be seen, a rich body of evidence informs the importation model. Missing from this literature, however, are studies linking IQ with prison misconduct. IQ can clearly be categorized as reflective of the importation perspective. An individual's IQ represents a stable attribute (Deary, Whiteman, Starr, Whalley, & Fox, 2004) that the inmate brings into the penal institution. Given the above findings of a negative relationship between IQ and criminal activity in the general population, it is likely that IQ will have a similar effect within the prison environment.

Please cite this article as: Diamond, B., et al., Individual and group IQ predict inmate violence, *Intelligence* (2012), doi:10.1016/j.intell.2012.01.010

3.3. The deprivation perspective

The deprivation perspective addresses the possibility that certain aspects of the prison environment may foster misconduct. Due to the confined and dispossessed nature of prison life, inmates may turn to misconduct to fulfill their various social, emotional and materialistic needs (Sykes, 1958). The most consistent predictor indicative of the deprivation perspective is prison gang membership. Repeatedly, researchers have shown that prison gang membership predicts violent behavior in prison (Cunningham & Sorensen, 2006b; 2007; DeLisi et al., 2004; Drury & DeLisi, 2011; Gaes, Wallace, Gilman, Klein-Saffran & Suppa, 2002).

The effects of other predictors have proven less consistent. Some studies have shown higher custody-level facilities to be positively related to violent misconduct (Camp et al., 2003; Morris et al., 2010), while others fail to find an effect of custody type (Bench & Allen, 2003; Camp & Gaes, 2005; Cunningham & Sorensen, 2006a). Finally, sentence length is often studied as a potential predictor of misconduct. Vast differences exist in how sentence length is categorized across studies, which makes generalization precarious. With that in mind, Camp et al. (2003) showed that longer sentence lengths were associated with a decreased likelihood of violent misconduct. Other researchers, however, have found opposite (Cunningham & Sorensen, 2006a; Morris et al., 2010) or even null (DeLisi et al., 2004) effects.

IQ score could potentially operate via deprivation processes. Separate from the effects of individual IQ scores, this factor may have an aggregate influence on violent misconduct. In other words, the average IQ score of all inmates within a particular prison may have an impact on an individual's involvement in misconduct. It may be the case that individual-level IQ has little or no impact on misconduct. Instead, the average IQ of all inmates within a particular prison may be a better predictor of the likelihood of an incident occurring. Alternatively, both individual-level IQ and prison-average IQ may emerge as important.

4. Methods

Data for this study were gleaned from the correctional agency of a large Southern U.S. state. The agency provided detailed behavioral histories along with individual specific data on all male inmates sentenced to state prisons between August 2004 and June 2006. Research indicates that misconduct is most likely to occur within the first three years of incarceration (Adams, 1992; Bottoms, 1999; Flanagan, 1980; Griffin & Hepburn, 2006; Zamble, 1992). Therefore, inmates who served a prison sentence of less than three years were removed from the sample. Given the unique circumstances of inmates serving a death sentence or a sentence of life without the possibility of parole, these inmates were also omitted. Finally, the sample was limited to inmates housed in a traditional prison facility (as opposed to a private prison, state jail, transfer facility or substance abuse unit). After omitting these cases, 12,981 inmates were available for analysis. From these cases, a simple-random-sample of 2500 inmates, housed across 30 different prison units, was drawn and analyzed for the current study. Eighty-two inmates were omitted from the analyses due to missing IQ scores.

4.1. Outcome measure

The present study assessed the impact of IQ score on violent prison misconduct. Violent misconduct was modeled as a dichotomous outcome (0 = no violent misconduct, 1 = violent misconduct) indicating whether each inmate engaged in violent misconduct against another inmate or against a prison staff member that resulted in at least minor injury (verbal threats of violence were not considered violent misconduct). A complete list of infractions defined as violence is presented in Appendix A.

4.2. Individual-level covariates

4.2.1. IQ score

All inmates completed an IQ test (Wechsler Adult Intelligence Scale-Revised, WAIS-R) upon entry to the prison system. Submitting to this test is mandated as part of the intake assessment procedures for all facilities in the state. Thus, each inmate's IQ score was measured as a continuous variable. Scores on the IQ test were standardized to meet the distribution found in the general population.[1] The general population values range from 50 to 150 with a mean of 100 and standard deviation of 15 (Neisser et al., 1996). As shown in Fig. 1, however, the average IQ score for these inmates was 90, 10 points below the national average. Additionally, the variation in scores was slightly less than that for the nation: the standard deviation was around 13 points compared to 15 for the general population (see Table 1).

4.2.2. Controls

Inmate-level predictors included a number of factors that have been shown in previous research to predict violent misconduct. These included age at admission (a continuous variable), prior incarceration (0 = first incarceration in state, 1 = incarcerated in state before) and prison gang membership status (0 = nonmember, 1 = member). Additionally, controls were included for the inmate's marital status at admission (0 = not married, 1 = married), race/ethnicity (a series of binary variables for Black and Hispanic, with White/Other as the reference category) and education level (a continuous measure reflecting the functional grade level of the inmate – respondents ranged from 1st grade [=1] to college level [=13]).

The state from which data were drawn houses inmates of various security levels within each prison facility (i.e., prison units are not security level specific). Therefore, a measure indicating whether the inmate was on high security status was included (0 = not high security, 1 = high security). The type of offense for which the inmate was currently sentenced was

[1] IQ was assessed as both a grand-mean- and group-mean-centered indicator. No substantive differences in the results were found. The group-mean-centered measure was included in this analysis for ease of interpretation and reflects the impact of an inmate's IQ relative to the mean IQ level of other inmates within the same prison unit. Further, this measure was standardized (Mean = 0.00, SD = 1.00).

Please cite this article as: Diamond, B., et al., Individual and group IQ predict inmate violence, *Intelligence* (2012), doi:10.1016/j.intell.2012.01.010

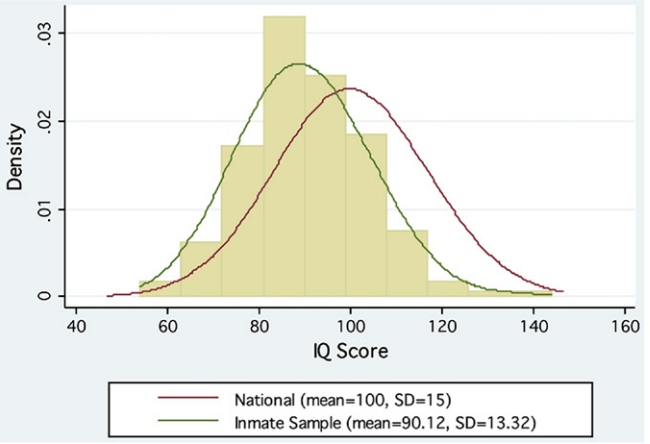

Fig. 1. Distribution of inmate IQ scores compared to national distribution.

operationalized by a series of binary variables indicating whether the inmate was incarcerated for a violent offense (0 = no, 1 = yes), a drug offense (0 = no, 1 = yes), or a property offense (0 = no, 1 = yes). The property offense variable served as the reference category. Also, sentence length (total years sentenced to prison at conviction) was included and was transformed by taking the natural log of the sentence length in years (to correct positive skew).

4.3. Unit-level covariates

Certain prison-specific factors were included in the analysis. These factors include the age (in years) of the prison facility (i.e., years of operation; included to account for regional and cultural variation in prison administration), the percentage of inmates within the facility with prior incarcerations, and the average IQ of the inmates in a unit.[2] An index indicating exposure to danger in a prison unit was created (see Morris & Worrall, 2010).[3] As a result of a factor analysis, this index combined the proportion of inmates in a unit who were serving time for a violent offense, the proportion of inmates who were confirmed gang members, the proportion of high-security inmates, the maximum capacity of the unit and a representation of the relative presence of competing gangs in a unit. Higher scores on the exposure to danger index indicate an increase in the danger level of a particular unit. This index may reflect strain as outlined in deprivation theory.

Descriptive statistics for all variables/scales utilized in the analyses can be found in Table 1.[4]

Table 1
Descriptive statistics for individual- and unit-level predictors.

Variables	Mean	Std dev	Min	Max
Outcome measure				
Violent prison misconduct	0.50	0.50	0	1
Individual-level covariates				
IQ	90.12	13.32	54	144
Admission age	31.92	11.36	16.20	78.77
Prior incarceration	0.33	0.47	0	1
Prison gang member	0.10	0.30	0	1
Married	0.16	0.37	0	1
Sentence length (natural log)	8.05	1.34	6.59	16.12
Violent offense	0.51	0.50	0	1
Drug offense	0.17	0.37	0	1
Black	0.34	0.46	0	1
Hispanic	0.36	0.48	0	1
White	0.30	0.46	0	1
Other	0.01	0.46	0	1
High security	0.08	0.27	0	1
Education level	6.86	3.92	0	12.9
Unit-level covariates				
Unit IQ	90.12	1.48	87.85	93.36
Age of prison	41.04	34.03	14	126
Percent with priors	0.35	0.12	0.17	0.56
Exposure to danger	−0.04	0.84	−1.12	1.71

5. Analytical procedure

Luke (2004) outlines a procedure for building multilevel models, which was followed for this study. The first step was to estimate a null model (with no predictors) to assess the amount of variance in violent misconduct that existed between the different prison units (this portion of the analysis is essentially an ANOVA procedure that determines whether between-prison variation exists in the mean level of misconduct). This analysis revealed that approximately 11% of the variance in violent misconduct existed between the different prisons, illustrating support for a multilevel model.[5] The second step incorporated all individual-level predictors in the multilevel model and assessed random-effects for individual-level covariates individually. None of the predictors included showed evidence of a random-effect; therefore, all were specified as fixed in the final model. Finally, unit-level

[2] Average unit IQ was grand-mean-centered and standardized.

[3] Morris and Worrall report that the index was internally consistent ($\alpha = .87$) and representative of a single construct, with an eigenvalue of 2.19.

[4] Multicollinearity was assessed via VIF statistics and bivariate correlations. No evidence of multicollinearity between individual- and prison-level indicators was found.

[5] Raudenbush and Byrk (2002, p. 334) suggest a variation on the ICC equation specific to binary models: $\rho = \tau_{00}/(\tau_{00} + \pi^2/3)$.

predictors were added to the model. Ultimately, the final multilevel logistic equation was specified as follows.

$$\text{Level 1}: \text{Logit}(\text{Misconduct}_{ij}) = \beta_{0j} + \beta_{1j}(\text{Age}) + \beta_{2j}(\text{Prior ncarceration}) + \beta_{3j}(\text{Gang Member}) + \beta_{4j}(\text{Married}) + \beta_{5j}(\text{Sentence Length}) + \beta_{6j}(\text{Violent Offense}) + \beta_{7j}(\text{Drug Offense}) + \beta_{8j}(\text{Black}) + \beta_{9j}(\text{Hispanic}) + \beta_{10j}(\text{High Security}) + \beta_{11j}(\text{Education Level}) + \beta_{12j}(IQ) + e_{it}$$

$$\text{Level 2}: \beta_{0j} = \theta_{k0} + \theta_{k1}(\text{Age of Prison}) + \theta_{k2}(\%\,\text{with Priors}) + \theta_{k3}(\text{Exposure to Danger}) + \theta_{k4}(\text{Unit IQ}) + U_{kj}\beta_{kj} = \theta_{k0} \text{ for k} = \text{specified as fixed.}$$

6. Results

The results of the logistic regression can be found in Table 2.[6] Before discussing the results from the IQ variables, it is informative to consider the effects of the other predictors. The results from the Base Model reveal that older and married inmates all exhibited decreased odds of committing violent misconduct. Meanwhile, being incarcerated for a violent offense was associated with a fifty percent increase in the odds of receiving an infraction for violent misconduct. Minority status predicted violent misconduct in that Black and Hispanic inmates were at increased odds of violent misconduct compared to White/Other inmates. Regarding the prison-level predictors, only the age of the prison unit reached statistical significance as inmates housed in older facilities had decreased odds of committing violent misconduct.

Turning to the findings from the IQ Model, three points deserve attention. First, individual-level IQ differences were significantly related to violent misconduct. Inmates with above average IQ scores (relative to other inmates housed in the same facility) were at decreased risk of being involved in a violent incident. A one standard deviation increase in IQ score (as compared to other inmates within the same prison unit) was associated with a ten percent reduction in the odds of committing violent misconduct. The second finding of interest was that the introduction of the IQ variables led to a slight attenuation of the relationship between race/ethnicity and misconduct.[7] Finally, the average IQ of the prisoners within each of the 30 different prison units was found to have a significant effect on the likelihood of an inmate committing violent misconduct. Simply stated, individuals housed in a unit with a higher average IQ score were significantly less likely to engage in violent misconduct.[8]

Table 2
Multilevel logit equations with violent prison misconduct as the outcome variable.

Individual-level covariates	Base model			IQ		
	OR	*b*	SE	OR	*b*	SE
IQ				0.90*	−0.10	0.05
Admission age	0.47***	−0.76	0.04	0.47***	−0.76	0.09
Prior incarceration	0.85	−0.16	0.11	0.85	−0.16	0.13
Prison gang member	0.97	−0.03	0.23	0.98	−0.02	0.24
Married	0.71*	−0.34	0.09	0.72*	−0.33	0.13
Sentence length	0.98	−0.02	0.05	0.98	−0.02	0.05
Violent offense[a]	1.50***	0.41	0.14	1.49***	0.40	0.09
Drug offense[a]	0.84	−0.17	0.12	0.84	−0.17	0.14
Black[b]	1.69***	0.52	0.25	1.60**	0.47	0.15
Hispanic[b]	1.31*	0.27	0.15	1.26	0.23	0.12
High security	0.78	−0.25	0.18	0.79	−0.23	0.23
Education level	0.93	−0.07	0.04	0.97	−0.03	0.05
Unit-level covariates						
Unit IQ				0.84**	−0.18	0.06
Age of prison	0.86**	−0.15	0.05	0.83**	−0.19	0.06
Percent with priors	0.87	−0.14	0.06	0.90	−0.10	0.08
Exposure to danger	1.14	0.13	0.10	1.07	0.07	0.08

[a] Property offense is reference category.
[b] White/other is reference category.
* $p<.05$.
** $p<.01$.
*** $p<.001$ (two-tailed).

7. Discussion

Researchers of prison misconduct have stressed the importance of understanding the role that cognitive ability plays in such behavior (Adams, 1992; Camp et al., 2003), but there has been little empirical investigation of this relationship. As such, the current study presented the first assessment of the relationship between IQ and violent prison misconduct. Analyses uncovered that IQ was a significant predictor of violent misconduct even after controlling for race/ethnicity, age, and educational attainment. Interestingly, results also showed that the average IQ score of the prison unit was a significant predictor of infractions for violent misconduct. These findings deserve further attention.

The finding that individual – as well as collective (i.e., prison-unit) – IQ influences an individual's likelihood for violent misconduct may be explained through a dynamic and multi-theoretical lens.[9] Consistent with the importation perspective, low-IQ individuals enter prison with limited proficiency in navigating their social environment, thus leaving them more susceptible to violence-inducing situations. This latter point suggests an interaction between the three theoretical perspectives of prison misconduct wherein individual characteristics make an inmate more or less prone to prison factors and contextual features conducive to violence.

[6] Robust standard errors were estimated in each model.
[7] A correlation table is provided in Appendix B.
[8] Prior research on inmate misconduct suggests that a binary indicator of misconduct is more appropriate than a frequency measure (Steiner & Wooldredge, 2009). Since reporting a misconduct infraction lies at the discretion of prison guards, frequency counts are prone to over- or under-inflation by reporting practices. This notwithstanding, the analyses were also estimated as multi-level count models (negative binomial, to account for overdispersion in the outcomes) with no substantive changes in the results.

[9] We would like to thank an anonymous reviewer for his/her commentary on the following discussion.

Please cite this article as: Diamond, B., et al., Individual and group IQ predict inmate violence, *Intelligence* (2012), doi:10.1016/j.intell.2012.01.010

The present analysis represents a rare opportunity to assess the importance of collective IQ in an individual's immediate social context (Gordon, 1997). Numerous studies have established a link between national, state and county-level average IQ and crime rates (Bartels et al., 2010; Beaver & Wright, 2011; McDaniel, 2006; Pesta et al., 2010; Rushton & Templer, 2009). However, the influence of the average IQ of those individuals that make up a person's daily social environment has not been assessed with respect to criminal activity. Gordon (1997, p. 224) explains that the "intelligence of the social surround" can have an important influence, beyond that of the individual, on a range of behavioral outcomes. In the prison context, the average IQ of the unit may greatly affect the prison environment and one's probability of engaging in misconduct. A large proportion of low-IQ inmates may have a substantial influence on the prison atmosphere via the congregation of individuals who have limited ability to successfully interpret and respond to social signals. Further, such a unit may provide additional challenges to correctional personnel in controlling inmate behavior.

In the end, we agree with the argument made by Wooldredge (2003) that inmate behavior is best understood by considering multiple theoretical explanations in tandem. Rare would be the case that an individual's characteristics, those of the prison environment or a specific situation would be the sole determinant in the commission of violent misconduct. Undoubtedly, these factors converge in a dynamic interplay of person and context to influence inmate behavior. Future studies of inmate behavior should account for IQ – at the individual and group level – as it may play a unique role in explaining this phenomenon.

Limitations to the present study need to be addressed. First, the data contained official reports of violent misconduct from a single state. As with any archival data, they do not provide insight as to unreported infractions. It is possible that these surreptitious incidents would provide a different perspective on the relationships assessed here. However, keeping in mind the similarities between the IQ scores of known and unknown criminals reported by Moffitt and Silva (1988), it may be reasonable to assume that this influence has only a minimal (if any) effect within the prison environment as well. But it is ultimately an empirical question.

Second, all inmates were required to take the IQ test upon entry into the prison system. As such, it may be that some inmates were reticent, or even defiant, towards the test and as a result scored well below their actual IQ. To the extent that this occurred, the prisoners' IQ scores may be subject to more measurement error than is typical among the general population. Because measurement error tends to attenuate relationships, the regression coefficients for IQ may be conservative estimates. Though, the opposite may be true if an inmate's propensity to display violent misconduct is correlated with his/her propensity to be defiant towards the intelligence test (see Wicherts & Zand Scholten, 2010) — an interesting hypothesis for future research to consider.

Third, due to data constraints, we were unable to capture other potentially relevant individual differences – such as personality, psychopathology and socio-emotional adjustment – that likely influence an inmate's propensity toward violent misconduct. It would be advantageous to our understanding of prison misconduct to measure these fundamental differences, as well as self-reported misconduct, in order to develop a more holistic description of prison misconduct.

With these limitations in mind, the current results provide support for the influence of intelligence in understanding violent prison misconduct. In the interest of using all available resources to manage prison misconduct, it appears that the average IQ of a prison unit may also be useful in limiting such behavior. Prison officials take multiple factors into consideration during intake as to the classification and placement of inmates within particular facilities. Perhaps the average IQ of the potential unit of assignment should be of additional concern during these decision-making processes. Maintaining a higher average IQ within a unit may be a simple consideration that significantly alters the social environment of the unit, requiring less direct control by guards and an ultimate decrease in violent misconduct.

Acknowledgments

The authors wish to thank Alex Piquero for his comments on an earlier draft of this manuscript.

Appendix A. Specific infractions defined as violent prison misconduct

Misconduct code
Fighting/assaulting an offender with a weapon, resulting in a non-serious injury
Fighting/assaulting an offender with a weapon, resulting in a serious injury
Fighting/assaulting an offender without a weapon, resulting in a non-serious injury
Fighting/assaulting an offender without a weapon, resulting in a serious injury
Fighting/assaulting an officer with a weapon, resulting in a non-serious injury
Fighting/assaulting an officer with a weapon, resulting in a serious injury
Fighting/assaulting an officer without a weapon, resulting in a non-serious injury
Fighting/assaulting an officer without a weapon, resulting in a serious injury
Extortion of money, property, other (from offender)
Sexual abuse
Rioting
Possession of a weapon
Abusive treatment of an animal
Gang recruiting
Exert authority over another offender

Appendix B. Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	IQ	1																
2	Admission age	.04	1															
3	Prior incarceration	−.01	.28	1														
4	Prison gang member	−.03	−.09	.18	1													
5	Married	.05	.18	.03	−.02	1												
6	Sentence length	.08	.14	.01	−.04	.07	1											
7	Violent offense	−.05	−.15	−.25	−.05	−.02	.22	1										
8	Drug offense	.01	.05	.11	.06	.03	−.06	−.46	1									
9	Black	−.19	−.10	.09	.03	−.04	−.02	.04	.08	1								
10	Hispanic	−.10	−.12	−.08	.04	.00	−.03	.03	−.03	−.53	1							
11	White	.29	.23	−.01	−.07	.04	.04	−.08	−.06	−.48	−.48	1						
12	High security	−.02	−.09	.10	.47	−.02	−.03	−.04	.01	−.06	.08	−.02	1					
13	Education level	.42	−.14	−.09	−.07	.00	.05	.08	−.02	−.06	−.14	.21	−.11	1				
14	Unit IQ	.11	.19	.05	−.07	.10	.03	−.01	−.01	−.06	−.01	.07	−.13	.05	1			
15	Age of prison	−.01	.05	.13	.04	−.02	.01	−.08	.06	.06	−.04	−.02	.03	−.04	−.13	1		
16	Percent with priors	.02	.47	.29	−.01	.11	.08	−.17	.08	−.02	−.08	.10	.00	−.11	.22	.34	1	
17	Exposure to danger	−.04	−.15	.06	.23	−.07	.06	−.03	.03	.03	.01	−.03	.39	−.03	−.38	.04	−.04	1

Note: all correlations greater than .20 were statistically significant at $p<.05$ (two-tailed)

References

Adams, K. (1992). Adjusting to prison life. *Crime and Justice: A Review of Research*, *16*, 275–359.

Bartels, J. M., Ryan, J. J., Urban, L. S., & Glass, L. A. (2010). Correlations between estimates of state IQ and FBI crime statistics. *Personality and Individual Differences*, *48*, 579–583.

Beaver, K. M., & Wright, J. P. (2011). The association between county-level IQ and county-level crime rates. *Intelligence*, *39*(4), 193–197.

Bench, L. L., & Allen, T. D. (2003). Investigating the stigma of prison classification: An experimental design. *Prison Journal*, *83*(4), 367–382.

Berk, R. A., Kriegler, B., & Baek, J. (2006). Forecasting dangerous inmate misconduct: An application of ensemble statistical procedures. *Journal of Quantitative Criminology*, *22*, 131–145.

Bottoms, A. E. (1999). Interpersonal violence and social order in prisons. *Crime and Justice: A Review of Research*, *26*, 205–281.

Camp, S. D., & Gaes, G. G. (2005). Criminogenic effects of the prison environment on inmate behavior: Some experimental evidence. *Crime and Delinquency*, *51*(3), 425–442.

Camp, S. D., Gaes, G. G., Langan, N. P., & Saylor, W. G. (2003). The influence of prisons on inmate misconduct: A multilevel investigation. *Justice Quarterly*, *20*, 501–533.

Cao, L., Zhao, J., & Van Dine, S. (1997). Prison disciplinary tickets: A test of the deprivation and importation models. *Journal of Criminal Justice*, *25*, 103–113.

Cunningham, M. D., & Sorensen, J. (2006). Actuarial models for assessment of prison violence risk: Revisions and extensions of the Risk Assessment Scale for Prison (RASP). *Assessment*, *13*, 253–265.

Cunningham, M. D., & Sorensen, J. (2006). Nothing to lose? A comparative examination of prison misconduct rates among life-without-parole and other long-term high-security inmates. *Criminal Justice and Behavior*, *33*(6), 683–705.

Cunningham, M. D., & Sorensen, J. (2007). Predictive factors for violent misconduct in close custody. *The Prison Journal*, *87*(2), 241–253.

DeLisi, M., Berg, M. T., & Hochstetler, A. (2004). Gang members, career criminals and prison violence: Further specification of the importation model of inmate behavior. *Criminal Justice Studies*, *17*, 369–383.

Deary, I. J., Whiteman, M. C., Starr, J. M., Whalley, L. J., & Fox, H. C. (2004). The impact of childhood intelligence on later life: Following up the Scottish mental surveys of 1932 and 1947. *Journal of Personality and Social Psychology*, *86*(1), 130–147.

Drury, A. J., & DeLisi, M. (2011). Gangkill: An exploratory empirical assessment of gang membership, homicide offending and prison misconduct. *Crime and Delinquency*, *57*(1), 130–146.

Ellis, D., Grasmick, H., & Gilman, B. (1974). Violence in prisons: A sociological analysis. *The American Journal of Sociology*, *80*, 16–43.

Flanagan, T. J. (1980). Time served and institutional misconduct: Patterns of involvement in disciplinary infractions among long-term and short-term inmates. *Journal of Criminal Justice*, *8*, 357–367.

Flanagan, T. J. (1983). Correlates of institutional misconduct among state prisoners: A research note. *Criminology*, *21*, 41–65.

Gaes, G. G., Wallace, S., Gilman, E., Klein-Saffran, J., & Suppa, S. (2002). The influence of prison gang affiliation on violence and other prison misconduct. *The Prison Journal*, *82*, 359–385.

Gendreau, P., Goggin, C. E., & Law, M. A. (1997). Predicting prison misconducts. *Criminal Justice & Behavior*, *24*, 414–431.

Gordon, R. A. (1997). Everyday life as an intelligence test: Effects of intelligence and intelligence context. *Intelligence*, *24*(1), 203–320.

Goring, C. (1913). *The English convict: A statistical study*. London: Darling and Son.

Griffin, M. L., & Hepburn, J. R. (2006). The effect of gang affiliation on violent misconduct among inmates during the early years of confinement. *Criminal Justice and Behavior*, *33*, 419–448.

Herrnstein, R. J., & Murray, C. (1994). *The Bell curve: Intelligence and class structure in American Life*. New York: Free Press.

Hirschi, T., & Hindelang, M. J. (1977). Intelligence and delinquency: A revisionist review. *American Sociological Review*, *42*(August), 571–587.

Irwin, J. K., & Cressey, D. R. (1962). Thieves, convicts and the inmate culture. *Social Problems*, *10*, 142–155.

Jiang, S., & Fisher-Giorlando, M. (2002). Inmate misconduct: A test of the deprivation, importation, and situational models. *The Prison Journal*, *82*, 335–358.

Jiang, S., & Winfree, L. T. (2006). Social support and the adjustment to prison life: Insights from a national sample. *Prison Journal*, *86*(1), 32–55.

Lahm, K. F. (2008). Inmate-on-inmate assault: A multilevel examination of prison violence. *Criminal Justice and Behavior*, *35*, 120–137.

Luke, D. A. (2004). *Multilevel modeling*. Thousand Oaks, CA: Sage.

Lynam, D., Moffitt, T., & Stouthamer-Loeber, M. (1993). Explaining the relation between IQ and delinquency: Class, race, test-motivation, school failure or self-control? *Journal of Abnormal Psychology*, *102*(2), 187–196.

Kandel, E., Mednick, S. A., Kirkegaard-Sorensen, L., Hutchings, B., Knop, J., Rosenberg, R., et al. (1988). IQ as a protective factor for subjects at high-risk for antisocial behavior. *Journal of Consulting and Clinical Psychology*, *56*(2), 224–226.

McDaniel, M. A. (2006). Estimating state IQ: Measurement challenges and preliminary correlates. *Intelligence*, *34*, 607–619.

McGloin, J. M., & Pratt, T. C. (2003). Cognitive ability and delinquent behavior among inner-city youth: A life-course analysis of main, mediating and interaction effects. *International Journal of Offender Therapy and Comparative Criminology*, *47*(3), 253–271.

Moffitt, T. E. (1990). The neuropsychology of juvenile delinquency: A critical review. In M. Tonry, & N. Morris (Eds.), *Crime and justice: An annual*

Please cite this article as: Diamond, B., et al., Individual and group IQ predict inmate violence, *Intelligence* (2012), doi:10.1016/j.intell.2012.01.010

ARTICLE IN PRESS

review of research, *vol. 12*. (pp. 99–169)Chicago: University of Chicago Press.
Moffitt, T. E., Gabrielli, W. F., & Mednick, S. A. (1981). Socioeconomic status, IQ, and delinquency. *Journal of Abnormal Psychology*, *90*(2), 152–156.
Moffitt, T. E., Lynam, D. R., & Silva, P. A. (1994). Neuropsychological tests predicting persistent male delinquency. *Criminology*, *32*(2), 277–300.
Moffitt, T. E., & Silva, P. A. (1988). IQ and delinquency: A direct test of the differential detection hypothesis. *Journal of Abnormal Psychology*, *97*(3), 330–333.
Morris, R. G., Longmire, D. R., Buffington-Vollum, J., & Vollum, S. (2010). Institutional misconduct and differential parole eligibility among capital inmates. *Criminal Justice and Behavior*, *37*, 413–438.
Morris, R. G., & Worrall, J. L. (2010). Prison architecture and institutional misconduct. *Crime and Delinquency*, doi:10.1177/0011128710386204 OnlineFirst, published on November 7, 2010 as.
Murchison, C. (1926). *Criminal intelligence.* Worcester, MA: Clark University Press.
Myers, L., & Levy, G. (1978). Description and prediction of the intractable inmate. *Crime and Delinquency*, *15*, 214–228.
Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., et al. (1996). Intelligence: Knowns and unknowns. *American Psychologist*, *51*(2), 77–101.
Pesta, B. J., McDaniel, M. A., & Bertsch, S. (2010). Toward an index of well-being for the fifty U.S. states. *Intelligence*, *38*, 160–168.
Petersilia, J., & Honig, P. K. (1980). *The prison experience of career criminals.* Santa Monica, CA: RAND.
Piquero, A. R., & White, N. A. (2003). On the relationship between cognitive abilities and life-course-persistent offending among a sample of African Americans: A longitudinal test of Moffitt's hypothesis. *Journal of Criminal Justice*, *31*, 399–409.
Porporino, F. J. (1986). Managing violent individuals in correctional settings. *Journal of Interpersonal Violence*, *1*, 213–237.
Ramirez, J. (1983). Race and the apprehension of inmate misconduct. *Journal of Criminal Justice*, *11*, 413–427.
Raudenbush, S. W., & Byrk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods.* Newbury Park, CA: SAGE.
Rushton, J. P., & Templer, D. I. (2009). National differences in intelligence, crime, income and skin color. *Intelligence*, *37*(4), 341–346.
Sorensen, J., & Cunningham, M. D. (2010). Conviction offense and prison violence: A comparative study of murderers and other offenders. *Crime and Delinquency*, *56*(1), 103–125.
Sorensen, J., & Pilgrim, R. L. (2000). An actuarial risk assessment of violence posed by capital murder defendants. *The Journal of Criminal Law and Criminology*, *90*, 1251–1270.
Sorensen, J., & Wrinkle, R. D. (1996). No hope for parole: Disciplinary infractions among death-sentenced and life without parole inmates. *Criminal Justice and Behavior*, *23*, 542–552.
Steiner, B., & Wooldredge, J. (2009). Implications of different outcome measures for an understanding of inmate misconduct. *Crime and Delinquency*, doi:10.1177/0011128709335151 OnlineFirst, published on April 28, 2009 as.
Steinke, P. (1991). Using situational factors to predict types of prison violence. *Journal of Offender Rehabilitation*, *17*, 119–132.
Sutherland, E. H. (1931). Mental deficiency and crime. In K. Young (Ed.), *Social Attitudes*. New York: Holt, Rinehart & Winston.
Sykes, G. M. (1958). *The society of captives: A study of a maximum security prison.* Princeton, NJ: Princeton University Press.
Templer, D. I., & Rushton, J. P. (2011). IQ, skin color, crime, HIV/AIDS, and income in 50 U.S. states. *Intelligence*, *39*(6), 437–442.
Wicherts, J. M., & Zand Scholten, A. (2010). Test anxiety and the validity of cognitive tests: A confirmatory factor analysis perspective and some empirical findings. *Intelligence*, *38*, 169–178.
Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature: The definitive study of the causes of crime.* New York: The Free Press.
Wolfgang, M. E. (1961). Quantitative analysis of adjustments to the prison community. *Journal of Criminal Law, Criminology and Police Science*, *51*, 607–618.
Wolfgang, M. E., Figlio, R. M., & Sellin, T. (1972). *Delinquency in a birth cohort.* Chicago: University of Chicago Press.
Wooldredge, J. D. (1994). Correlates of deviant behavior among inmates of U.S. correctional facilities. *Journal of Crime and Justice*, *14*, 1–25.
Wooldredge, J., Griffin, T., & Pratt, T. (2001). Considering hierarchical models for research on inmate behavior: Predicting misconduct with multilevel data. *Justice Quarterly*, *18*, 203–231.
Wooldredge, J. (2003). Keeping pace with evolving prison populations for effective management. *Criminology & Public Policy*, *2*(2), 253–258.
Zamble, E. (1992). Behavior and adaptation in long-term prison inmates: Descriptive longitudinal results. *Criminal Justice and Behavior*, *19*, 409–425.

Please cite this article as: Diamond, B., et al., Individual and group IQ predict inmate violence, *Intelligence* (2012), doi:10.1016/j.intell.2012.01.010