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Correlations between estimates of state IQ and FBI crime statistics

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ABSTRACT

Previous research suggests that crime is negatively associated with IQ at the individual level and the aggregate state level. The purpose of the present study was to further explore the relationship between state IQ estimates and various categories of violent and property crimes. State demographic information including the gross state product, pupil/teacher ratio, and percent Black, Asian, and Hispanic were included in the correlational analyses. State IQ was significantly and negatively correlated with the violent crimes of murder, aggravated assault and robbery as well as the property crimes of motor vehicle theft, theft and burglary. Additionally, regression analyses were conducted for each crime significantly related to state IQ, controlling for significant state demographic variables. In general, results suggest that the prevalence of both violent and property crimes is associated with lower state IQs.

1. Introduction

A great deal of research has examined the relationship between cognitive ability and crime. Studies have assessed the role of IQ in delinquency (Hirschi & Hindelang, 1977; Lynam, Moffitt, & Stouthamer-Loeber, 1993), adult offending (Gendreau, Little, & Goggin, 1996), in regards to offenders versus non–offenders (Lynam et al., 1993; Wilson & Herrnstein, 1985), as well as differences for specific crimes such as sexual offenders (Beggs & Grace, 2008; Guay, Ouimet, & Proulx, 2005). Each of these studies has focused on IQ measured at the individual level. Recently researchers have examined this relationship at the aggregate level, estimating the IQ of states and examining the correlation with several other measures, including crime statistics (McDaniel, 2006).

One aspect of the issue that has garnered significant attention is the association of IQ with particular crimes. It has been suggested that engaging in violent crime as compared to property and "white collar" crimes may itself be characteristic of a less intelligent offender (Wilson & Herrnstein, 1985). That is, violent crimes, in addition to being riskier with respect to arrest probability, tend to reflect more impulsive, less well-planned crimes than, for example, fraud which may be beyond the capabilities of those with lower IQs. Recent research by Fergusson, Horwood, and Ridder (2005) also revealed IQ in middle childhood to be predictive of violent as well as property crimes committed in early adulthood, though this relationship was partially explained via early conduct problems. Another subcategory of crime that currently holds public attention involves sexual offenders. While research has primarily focused on the personalities rather than intellectual abilities/deficits of rapists, results of studies that have assessed IQ have been inconsistent.

Though aggregate levels of IQ have garnered less attention, several researchers have examined the relationship between it and a number of variables. A recent study by Rushton and Templer (2009) for example, examined the relationship between national IQs and crime finding significant correlations between IQ, serious assault, rape and murder. Likewise, Lynn & Vanhanen (2002) estimated national-level IQ using averages from a number of sources, and demonstrated a strong and statistically significant correlation with gross domestic product. At the state level Kanazawa (2006) provided a method of estimating IQ that utilized Scholastic Aptitude Test (SAT) scores, and found a significant correlation between state IQ and gross state product (GSP). Using an alternative method of state IQ estimation (National Assessment of Educational Progress (NAEP) data), McDaniel (2006) examined the relationship between state IQ and gross state product, school expenditure per student, pupil/teacher ratio, percent Black, Hispanic, or Asian, low birth weight, percent receiving no prenatal care, and violent crime (for an explanation of all variables and their sources, see McDaniel (2006), pp. 609–610). Bivariate correlations indicated that IQ was moderately to strongly negatively correlated to percent black (−0.51), percent receiving no prenatal care (−0.58), violent crime (−0.58), percent low birth weight (−.71), and state health (−.75). Additionally, results indicated a significant negative linear correlation ($r = -0.58$) between state IQ and overall rate of violent crime.

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As McDaniel suggests, and as has been done at the individual level, it may be informative to examine the association of different categories of violent crime and state IQ. However, McDaniel provided only the correlation between violent crime and state IQ, without regard to crime subtypes (e.g., property crime, murder, etc.). Therefore, the purpose of the present study is to replicate and extend the work of McDaniel (2006) by examining the relationship between his estimated state IQs and subcategories of both violent and property crimes. Specifically, our aim is to offer a more fine-grained analysis of state IQ and crime and examine whether the relationship reported by McDaniel (2006) between state IQ estimates and violent crime is consistent across categories of violent crime and extends to property crimes. Also of interest is whether property crime will demonstrate a less robust relationship with IQ than do violent offences (Wilson & Herrnstein, 1985).

2. Method

2.1. Measurement of key variables

2.1.1. IQ estimates

The present study utilized the state IQ estimates of McDaniel (2006; see his Table 3, p. 612). He used National Assessment of Educational Progress (NAEP) reading and math standardized test scores in calculating IQ estimates. The NAEP is administered in all 50 states to 4th, 8th, and 12th grade public school students, and has been collected for a number of years. Only the data for 4th and 8th grades are available by state. Specifically, the reading and math scores for these grades were standardized and averaged across years to obtain state level IQ estimates.

State level IQ was estimated using several years of data. Fourth grade reading data was collected for six years, math for four years, while 8th grade reading data was collected for four years, and math for five years. These years were variable, and ranged from 1990 to 2005. McDaniel (2006) conducted reliability tests for state IQ, and an alpha of 0.99 is reported, although only 16 states reported information for all tests for all years to be included in the reliability analysis.

2.1.2. Pupil/teacher ratio

As per McDaniel (2006), the pupil/teacher ratio for elementary and secondary schools in each state (2006–2007) was used as a measure of class size.

2.1.3. Percent Black, Asian and Hispanic in the state

Details from the author.

2.1.4. Gross state product

The gross state product data, as reported by McDaniel (2006), was included as a measure of state productivity. As noted by McDaniel, this represents the per capita gross state product averaged across 2000 to 2004.

2.1.5. Crime

Offense statistics were drawn from the Uniform Crime Reports published by the Federal Bureau of Investigation (details from the author). The overall violent and property crime rates for each state were obtained, as well as the rates for the individual crimes examined. Data were collected for the years 2005–2006 and all offenses were averaged. The mean for each offense category was included in the data analysis. This technique is similar to McDaniel, and covers the same years as his study.

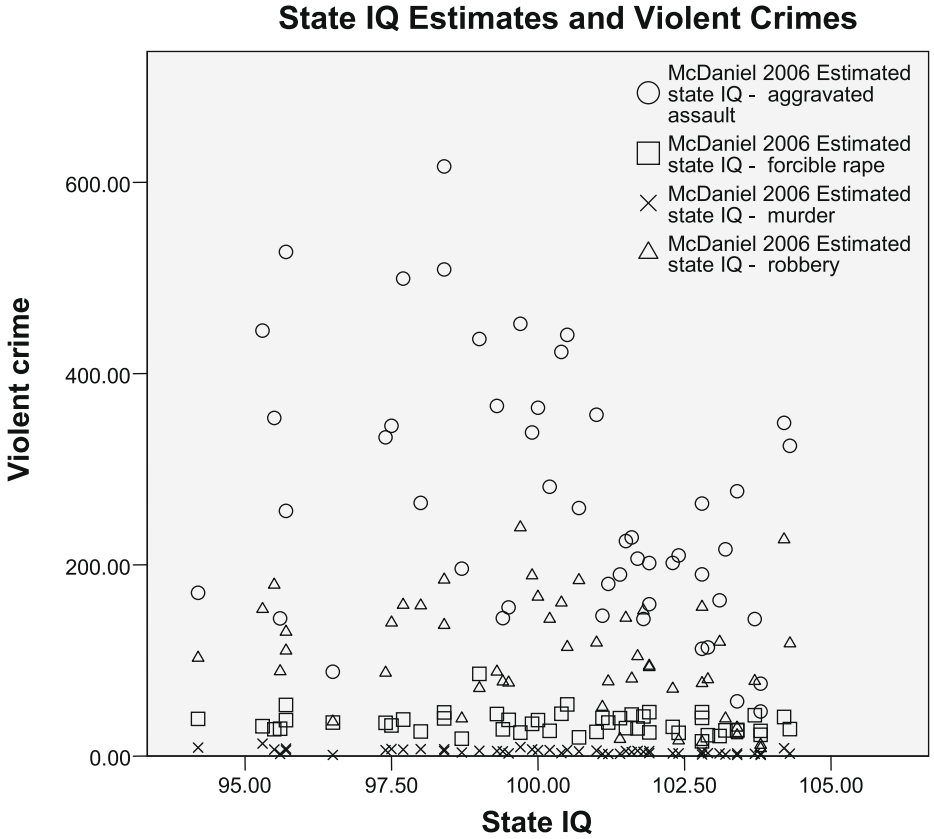

Fig. 1. State IQ estimates and violent crime.

2.2. Data analysis

McDaniel (2006) used only one, overall measure of the violent crime rate, and the subsequent analysis and discussion was thus underdeveloped. This study reports Pearson product-moment correlations between McDaniel's IQ estimates, state demographic information and subcategories, as well as overall, crime statistics.

3. Results

Figs. 1 and 2 presents the mean state IQ estimates in relation to violent and property crimes, respectively. Table 1 provides the correlations among all the variables. With respect to the relationship between state IQ estimates and crime, the estimates were significantly and negatively correlated with the violent crimes of murder ($r = -.57$), aggravated assault ($r = -.41$) and robbery ($r = -.29$). The property crimes of burglary ($r = -.57$), theft ($r = -.36$), and motor vehicle theft ($r = -.29$) were also significantly and negatively correlated with state IQ estimates. Likewise, race was also significantly correlated with state IQ estimates and several of the categories of crimes. In order to further examine the relationship between the demographic variables, state IQ estimates and crime a series of multiple regressions were conducted using each category of crime that was significantly correlated with state IQ. Variables that were also significantly correlated with each crime were included in the analyses ($p < .01$).

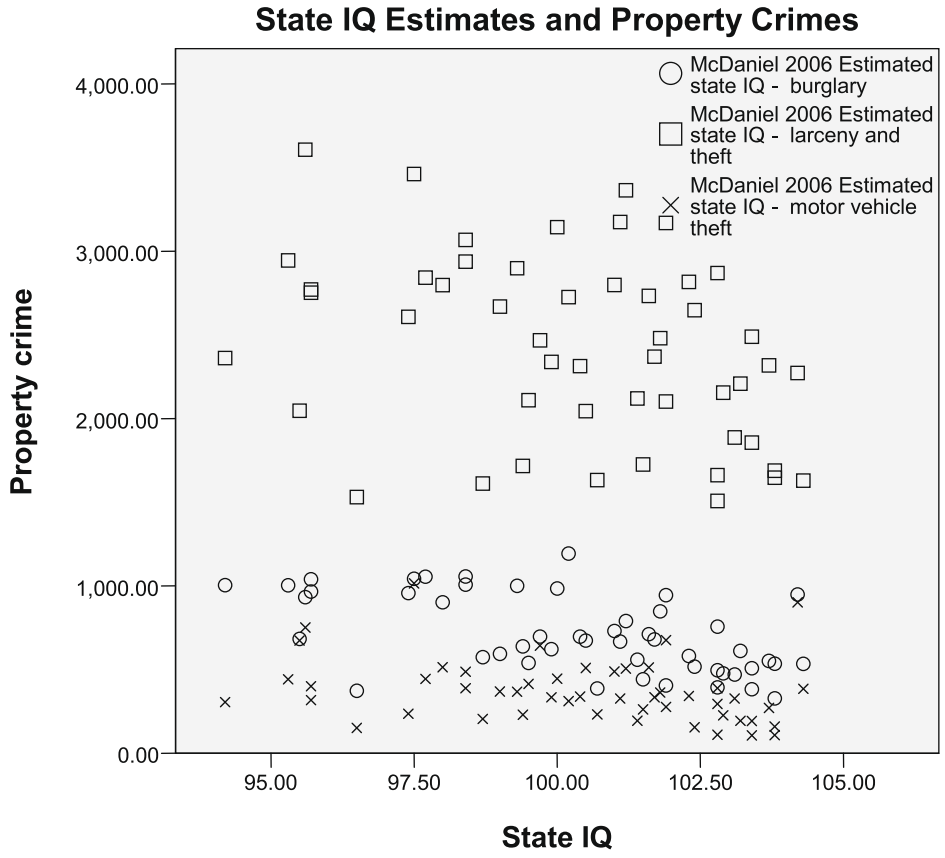

Fig. 2. State IQ estimates and property crime.

Table 1
Correlational matrix of measures.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. GSP	–	.18	.27**	−.03	.01	.28*	.14	−.19	.26	.19*	.08	−.20	−.31*	−.20	.06*
2. Asian	–	–	−.09	.14	.15	−.28**	-.03**	−.13**	.08**	−.08	−.10**	.26	.08**	.25	.36*
3. Black	–	–	–	−.12	−.18*	−.51*	.55**	.71**	.60**	−.07	.43**	.27	.44**	.18	.19
4. Hispanic	–	–	–	–	.35*	-.35*	.39**	.13	.21	.11*	.27	.14*	.16	.11*	.13
5. Pupil	–	–	–	–	–	−.32	.20**	−.01**	.03*	.35*	.09**	.30**	.20**	.31*	.21*
6. IQ	–	–	–	–	–	–	−.58**	−.57**	−.29**	−.20*	−.41**	−.45**	−.57**	−.29**	−.29*
7. Violent	–	–	–	–	–	–	–	.60**	.61**	.32*	.86**	.42**	.35**	.48**	.32*
8. Murder	–	–	–	–	–	–	–	–	.70**	.13	.67**	.46**	.61**	.30*	.46**
9. Robbery	–	–	–	–	–	–	–	–	–	−.02	.61**	.40*	.47*	.21*	.61**
10. Rape	–	–	–	–	–	–	–	–	–	–	.40**	.31**	.28**	.31**	.16**
11. Assault	–	–	–	–	–	–	–	–	–	–	–	.51**	.57**	.41**	.43**
12. Property	–	–	–	–	–	–	–	–	–	–	–	–	.86**	.96**	.72**
13. Burglary	–	–	–	–	–	–	–	–	–	–	–	–	–	.73**	.55**
14. Theft	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.55**
15. MVT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

* $p = .05$.
** $p = .01$.

Table 2
Regression for subcategories of crime.

Measure	β	t	p
Aggravated assault (N = 50)			
IQ	−.26	−1.74	NS
% Black	.30	2.00	NS
Robbery (N = 50)			
IQ	.02	0.13	NS
% Black	.61	4.51	<.01
Murder (N = 50)			
IQ	−.27	−2.44	<.05
% Black	.57	5.10	<.01
Burglary (N = 50)			
IQ	−.46	−3.38	<.01
% Black	.20	1.48	NS

Results of each regression are displayed in Table 2. For the crime of aggravated assault results revealed that while the overall model was significant, $F(2, 47) = 7.12$, $p < .01$, $R^2 = .23$, neither state IQ nor percent Black in the state were significant independent predictors. For the crime of robbery, $F(2, 47) = 13.33$, $p < .01$, $R^2 = .36$, only percent Black in the state was a significant independent predictor. For murder, $F(2, 47) = 7.12$, $p < .01$, $R^2 = .23$, state IQ and percent Black in the state were both significant predictors. The regression for burglary was significant, $F(2, 47) = 12.69$, $p < .01$, $R^2 = .35$, with only state IQ emerging as a significant independent predictor.

4. Discussion

Results of the present study reveal state IQ estimates to be significantly and negatively associated with violent crime including aggravated assault, robbery, and murder. Correlations between state IQ and violent crimes ranged from −.29 to −.57 among the subcategories of violent crime, with the correlation between state IQ and total violent crime replicating the correlation obtained by McDaniel (i.e., $r = -.58$). It is interesting that the present correlation and that of McDaniel did not differ in light of the fact that we used crime statistics from 2005 to 2006, whereas McDaniel used statistics from 2002 to 2004. Moreover, the present results correspond to those reported at the individual level of analysis suggesting that as IQ declines the prevalence of violent crime increases (Herrnstein & Murray, 1994; Wilson & Herrnstein, 1985). Results with respect to the crime of rape, however, suggest that lower IQs are more prevalent among those committing other violent crimes, particularly murder.

Evolutionary theorists (Quinsey & Lalumière, 1995; Rushton, 1985; Thornhill & Thornhill, 1983) suggest that rape may be an evolved capacity most prevalent among those lower in intelligence. Mating strategies exist on a continuum pertaining to the number of offspring and the investment in the offspring. That is, at one end is a large number of offspring and little investment (r-strategy) and few offspring but greater investment (K-strategy) at the other (Rushton, 1985). With respect to humans, individual differences in reproductive strategies exist and are in part explained by personality and intelligence. With respect to the latter, less intelligent people adopt a strategy of maximizing the number of offspring. Rape may be a perturbation of an unsuccessful short-term mating approach (i.e., the pursuit of brief, uncommitted sexual relationships; Quinsey & Lalumière, 1995) and, in general, a "last resort" within the unsuccessful male's behavioral repertoire (Thornhill & Thornhill, 1983). Rape, despite the risk involved and low probability of conception, is a viable alternative to those unsuccessful at attracting mates due to their difficulty in "climbing the social ladder" (Thornhill & Thornhill, 1983, p. 141); lower intelligence being an impediment to climbing the ladder. While a recent study by Rushton and Templer (2009) found rape to be negatively correlated with national IQ, previous research (e.g., Cantor, Blanchard, Robichaud, & Christensen, 2005) reported no significant association between IQ and rape.

A possible explanation for these contradictory results and thus lack of consistent support for the evolutionary hypothesis is the nature of the crime itself. Palmer (1988) suggests that the crime of rape is a predominantly aggressive rather than sexual act with the ultimate goal being dominance/violence. A recent meta-analysis by Cantor, Blanchard, Robinchaud, and Christensen (2005) suggests that lower IQ is uniquely related to pedophilia and not other sexual offenses such as rape; Cantor et al. postulate a common biological underpinning, developmental brain abnormalities, to both lower IQ and pedophilia. While a study by Guay et al. (2005) suggests significant differences between sex offenders and non-sex offenders in certain aspects of IQ (e.g., vocabulary and comprehension), the researchers did not distinguish among sexual offences (i.e., rape and other sexual offences such as pedophilia). If rape is distinguishable from other sexual offences in that it is principally a violent not a sexual act, such an explanation is still at odds with our results. If rape is hardly distinguishable from other violent crimes, one would not expect to find significant differences among rapists and other violent offenders. Our results, however, suggest IQ differences, with rape being the only crime in which a significant negative correlation did not materialize.

At the individual level, Wilson and Herrnstein (1985) suggest a distinction in IQ and the type of crime with lower IQs more characteristic of violent offenders relative to those committing property offenses. Our results reveal similar significant and negative correlations between state IQ and property crime as was the case with violent crime. Specifically, IQ was negatively correlated with motor vehicle theft, theft and burglary. While the primary focus of our study was the relationship between state IQ estimates and crime we did include state demographic variables including the gross state product, teacher/pupil ratio and percent Black, Asian and Hispanic in the state. Percent Black in the state emerged as a significant predictor of a number of property and violent crimes and in an attempt to control for the influence of this variable, separate regression analyses were conducted for each crime. While for the violent crime of robbery, state IQ was no longer a significant predictor when controlling for percent Black in the state, the opposite was true for the property crime of burglary (i.e., only state IQ emerged as a significant independent predictor). Such results would suggest that the percent Black in the state may be a mediating variable for some crimes (e.g., robbery) and not for others (e.g., burglary). However, there is a complex relationship between race, IQ and crime, the adequate elucidation of which is beyond the scope of this article. At the individual level there are certainly important variables that help explain the relationship between IQ and crime, not the least of which being socioeconomic status (SES).

A recent study by Fergusson et al. (2005) examined the relationship between IQ at ages 8–9 and property crime at ages 21–25. Results suggested that IQ was a negative predictor of property crimes but that this association was no longer significant when controlling for conduct disorder, and a host of social and family variables (e.g., family instability, socioeconomic disadvantage). The results are interpreted by the authors as suggesting that IQ is unrelated to later crime and is instead explained by such mediating variables. However, IQ and SES are highly correlated. As Wilson and Herrnstein (1985) explain: "...it is fallacious to conclude that the SES difference is essential and the IQ incidental as it would be to conclude the reverse, that IQ is essential and SES incidental... It is a curious, and common, lapse in the logic of criminology to assume that merely controlling for a variable, such as SES, endows it with explanatory power" (pp. 156–157). Fergusson et al. did find IQ predictive of educational attainment and occupational success, a plausible mediator in the relationship between IQ and crime.

This is the first study to examine the relationship between state IQ and the subcategories of crime as the McDaniel (2006) study included only one measure of overall violent crime. The results suggest a significant correlation between state IQ and crime, but it is important to note that the relationship between IQ and violent crime may not hold at the extreme low and high ends of the ability spectrum (i.e., curvilinear relationship; Herrnstein & Murray, 1994; Wilson & Herrnstein, 1985). Future research is needed to clarify this possibility. There are several other limitations worthy of note. First, the present study is correlational and thus precludes any interpretation of causation. Furthermore, there are a number of additional factors including SES (Guay et al., 2005), that while not negating the relationship between IQ and crime, has been shown to attenuate the association (Wilson & Herrnstein, 1985). While socioeconomic factors should be a focus of public policy aimed at lowering crime, policies would further benefit from a focus on what may also be an underlying precursor (i.e., intellectual deficits; Herrnstein & Murray, 1994). It should also be noted that, in general, the inclusion of such variables at the individual but not state level make the generalizations across these two levels tenuous.

With respect to the state IQ estimates, there are several specific weaknesses that must be addressed. The estimates of McDaniel which rely on standardized elementary and secondary level math and reading test scores were selected over the estimates of Kanazawa (2006) due to the issue of selection bias acknowledged by Kanazawa. That is, the SAT is a test exclusive to college-bound high school seniors, whereas more representative data can be expected from the less selective NAEP estimates of state IQ (which include all public school students). This method of estimation may be criticized on the grounds that it underestimates state IQ by including public but not private school students (see McDaniel, 2006). However, the extent of the selection bias associated with this method was less egregious than that associated with comparable estimation methods (e.g., Kanazawa, 2006; for an extensive discussion on the weaknesses of NAEP data, see McDaniel, 2006). Thus, the McDaniel (2006) estimates were selected for use in the present study. It should also be noted, with respect to the correlational analyses, that the populations of states differ substantially and any assumption of identically distributed data points was likely violated.

The source of offending data also contains well known weaknesses. In addition to the problems of underreporting (specifically for rape for the current study), hierarchical reporting, and the myriad of special circumstances and reporting issues per year (details from the author), there are fundamental differences between the measures used for this study. For example, IQ data is estimated for a juvenile population, while offense data covers all age groups. Again, this study was not intended to identify a causal relationship between IQ and crime, but to assess the utility of the aggregate level IQ measure.

As noted, the relationship between IQ and criminal activity is highly complex and a variety of other factors have been introduced to the argument. A few of the most prevalent are race, class, school performance, and impulsivity. Any policy recommendations must take the complex nature of the relationship of IQ and crime into account. McDaniel (2006) addresses a number of policy efforts including attempts by state governments to retain those with high IQs in their states, raise the IQ of persons residing in their states, and attract individuals with high IQs to relocate to their states (McDaniel, 2006).

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