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Is intelligence associated with mortality from lethal force by law enforcement?

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ABSTRACT

Intelligence (IQ) has emerged as an important determinant of many social and health outcomes, and is associated with criminal behavior. This ecological study tested whether IQ was associated with the use of lethal force by law enforcement by examining estimates of state IQ and mortality from lethal force in 50 U.S. states. These data were obtained from a variety of sources freely available on the Internet, including information about mortality from lethal force from a database compiled by a news website, *The Guardian*. State IQ was negatively correlated with the rate of people killed by law enforcement ($r = -0.50$, $p < .01$). This association persisted even after adjusting for numerous demographic and social characteristics; each point increase in state IQ was associated with a 6% reduction in the rate ratio of deaths from lethal force (IRR = 0.94 [95% CI = 0.90, 0.98]). States with higher IQs may have safer communities, and law enforcement officers may act less confrontationally or hostilely during police-suspect encounters in these areas. However, this hypothesis needs to be investigated in future studies using smaller aggregate units for IQ and include more information about neighborhood, law enforcement, and suspect characteristics.

1. Introduction

Intelligence (IQ) has emerged as an important determinant of many social and health outcomes, including but not limited to poverty, all-cause mortality, and obesity (Calvin et al., 2011; Gottfredson, 2004; Kanazawa, 2013; Wraw, Deary, Gale, & Der, 2015; Yu, Han, Cao, & Guo, 2010). Also, recent investigations have found that IQ is linked to criminal behavior, including burglary, assault, and rape (Bartels, Ryan, Urban, & Glass, 2010; Beaver & Wright, 2011; Burhan, Kurniawan, Sidek, & Mohamad, 2014). Criminal behavior is disruptive within society and decreases economic prosperity within communities (Collins & Margo, 2007; Detotto & Pulina, 2013; Mauro & Carmeci, 2007; Mehlum, Moene, & Torvik, 2005).

Law enforcement officers have been authorized by local, state, and federal governments to use force to prevent and respond to criminal behavior. Lethal force occurs when officers choose to use force that creates a substantial risk of causing death, serious bodily harm, or injury to a criminal or suspect. The decision to use lethal force depends on a confluence of factors that span from the characteristics and behavior of suspects and law enforcement officers to the circumstances of an encounter with the law enforcement officer and the features of the surrounding environment (Klahm & Tillyer, 2010). Regarding the demographic characteristics of the suspect, law enforcement officers are more likely to use lethal force against male rather than female suspects; less likely to use lethal force against older suspects; and more likely to use force against individuals with mental disorders compared to those without mental disorders (DeGue, Fowler, & Calkins, 2016; Feldman, Chen, Waterman, & Krieger, 2016; Klahm & Tillyer, 2010). There is limited empirical support for race, ethnicity, and social class (DeGue et al., 2016; Fryer, 2016; Klahm & Tillyer, 2010).

Concerning the demographic characteristics of the police officer, research has shown that male law enforcement officers are more likely to use lethal force than female police officers (Klahm & Tillyer, 2010). Notably, law enforcement officers with a college education are less likely to use lethal force than law enforcement personnel without a college education (Chapman, 2012), and senior officers are less likely to use lethal force than younger officers (McElvain & Kposowa, 2008; Paoline & Terrill, 2007; Rydberg & Terrill, 2010).

The behavior of the suspect during an encounter with a law enforcement officer also plays a significant role in the decision to use lethal force. For example, law enforcement officers are more likely to use lethal force against suspects who possess weapons, such as handguns or knives, compared to suspects without weapons (Fryer, 2016; Lee, Jang, Yun, Lim, & Tushaus, 2010; Lee, Vaughn, & Lim, 2014). Police officers are also more likely to use lethal force against suspects who physically or verbally resist the law enforcement officer, compared

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to suspects who do not resist (Fryer, 2016; Lee et al., 2010, 2014). Last, research on the characteristics of the environment has been mixed, but recent evidence suggests that the level of violent crime within a neighborhood is positively associated with the decision to use lethal force. However, this effect is less pronounced, to the point of non-significance, as the level of aggregation, such as states versus cities, increases (Lee et al., 2014).

The factors discussed above are just some that have been implicated in the decision to use lethal force against a suspect, but missing from this list is IQ. As mentioned earlier, IQ is negatively associated with criminal behavior (Bartels et al., 2010; Beaver & Wright, 2011; Burhan et al., 2014), and accounts for some of the racial gaps in arrest and incarceration rates (Beaver et al., 2013). Also, IQ has a very high positive correlation with education attainment (Deary & Johnson, 2010). Therefore, studies that show an association of educational attainment with lethal force may, by proxy, be demonstrating an association of IQ with lethal force. Thus, this study tests whether IQ is associated with lethal force by law enforcement by ecologically examining mortality from lethal force in 50 U.S. states. We hypothesize that IQ will be negatively associated with mortality from lethal force, and this association will remain even after adjusting for numerous demographic and socioeconomic characteristics of each state.

2. Methods

This study used a dataset constructed from a variety of sources publicly available on the Internet.

3. Measures

3.1. Persons killed by law enforcement

The primary outcome variable was the rate of persons killed by law enforcement in each state. These data came from *The Counted,*[1] which is a publicly available database that tracks the number of individuals killed by police and other law enforcement agencies in the United States. This project was started by *The Guardian*[2]—a United Kingdom-based news organization—and has recorded the number of persons killed by law enforcement in each state since 2015. This database includes any death from an encounter with a law enforcement officer; excludes self-inflicted deaths that occur during encounters with law enforcement personnel; and excludes deaths from mass shootouts where it is unclear whether victims died from civilian or law enforcement gunfire. The Guardian collects information on law enforcement killings by reviewing police reports and witness statements, monitoring regional news outlets, and accessing data from other open-source projects, such as *Fatal Encounters*[3] and *Killed by Police.*[4]

This study used data from 2015 and 2016. The number of persons killed by law enforcement in 2015 and 2016 was highly consistent ($\alpha = 0.98$, $p < .01$); therefore, the total number of deaths in these years was combined and averaged to determine the average number of persons killed by law enforcement in each state per year during this two-year period. Next, this number was divided by the total state population (as of 2015) and multiplied by a million to reflect the average number of persons killed per year by law enforcement in each state per million population. This number was rounded to the tenth decimal place.

3.2. State IQ

The primary independent variable was state IQ, which was based on measurements by McDaniel (2006; see Table 3, p. 612). McDaniel measured state IQ using reading and math scores from the National Assessment of Educational Progress (NAEP). The NAEP administered these tests to 4th, 8th, and 12th-grade public school students across 50 states, however, the 12th-grade data were not available by state. Therefore, only data from the 4th and 8th grade was used to compute estimates of state IQ. Reading and math test scores from 4th and 8th-grade public school students were aggregated, standardized, and averaged across many years (1990 to 2005) to obtain state-level IQ estimates. The reliability of scores among states that reported math and reading scores for all years ($N = 16$) was very high ($\alpha = 0.99$), and the reliability of scores across all states, regardless of the number of years' scores were reported, was identical ($\alpha = 0.99$). Estimated state IQ is associated with a variety of important outcomes, including violent and property crime (Bartels et al., 2010), gross state product, state health, government effectiveness (McDaniel, 2006), and numerous health disparities (Reeve & Basalik, 2010).

3.3. Covariates

Covariates were selected parsimoniously based on factors that influenced IQ, criminal behavior, and law enforcement policies and actions. Sex, age, and race are associated with criminal behavior (Ellis, 2017; Ulmer & Steffensmeier, 2014; Vaske, Wright, Boisvert, & Beaver, 2011), and there are some IQ differences between races (Rushton & Jensen, 2005), thus we used information from the Census Bureau's Population Survey (USCB, 2016) to obtain state estimates for male and white populations and median age. The percentage of white population in each state was used as a proxy measure for racial diversity. Next, we used Pesta et al.'s "state well-being" measure (Pesta, McDaniel, & Bertsch, 2010; B. Pesta, personal communication, June 30, 2018) to account for state characteristics related to education, economics, religiosity, health, and crime. This measure was chosen because it was a representative index of many factors related to IQ, criminal behavior, and law enforcement policies and actions. We also obtained measurements for marital divorce[5] and political party affiliation.[6] The divorce rate is an important indicator of family disruption and is linked with criminal behavior (Cáceres-Delpiano & Giolito, 2012), and party affiliation is a proxy measure for how each state addresses crime and criminal behavior (Ren, Zhao, & Lovrich, 2008). Last, we collected information on unemployment and urban density from Bureau of Labor Statistics (BLS, 2017) and Census Bureau's Population Survey (USCB, 2016), respectively. Unemployment is associated with crime rates (Phillips & Land, 2012), and the proportion of state residents living within metropolitan areas accounted for ecological and structural differences between urban and rural areas (Wells & Weisheit, 2004).

4. Statistical analyses

Descriptive statistics, means, and standard deviations were computed for all variables included in the analyses, and Pearson correlation coefficients were derived to quantify bivariate associations. A series of Poisson regressions were completed to ascertain whether IQ was associated with mortality from lethal force. The first model included only IQ. The second model included IQ and variables that assessed the demographic characteristics of each state, including the percentage of males, Whites, and average median age. The third model included IQ and variables that assessed the social factors of each state, including

[1] https://www.theguardian.com/us-news/ng-interactive/2015/jun/01/the-counted-police-killings-us-database
[2] https://www.theguardian.com/us
[3] http://www.fatalencounters.org/
[4] http://killedbypolice.net/
[5] https://www.cdc.gov/nchs/data/dvs/state_divorce_rates_90_95_99-16.pdf
[6] http://news.gallup.com/poll/203117/gop-maintains-edge-state-party-affiliation-2016.aspx

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