A Bird's Eye View of Civilians Killed by Police in 2015: Further Evidence of Implicit Bias

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Abstract

Research Summary

We analyzed 990 police fatal shootings using data compiled by *The Washington Post* in 2015. After first providing a basic descriptive analysis of these shootings, we then examined the data for evidence of implicit bias using multivariate regression models predicting two indicators of threat perception failure: (1) whether the civilian was *not* attacking the officer(s) or other civilians just before being fatally shot, and (2) whether the civilian was unarmed when fatally shot. The results indicated civilians from "other" minority groups were significantly more likely than whites to have *not* been attacking the officer(s) or other civilians, and black civilians were more than twice as likely as white civilians to have been unarmed.

Policy Implications

We implore the federal government to move forward with their publication of a national police use-of-force database, including as much information about the officers involved as possible. We further suggest police departments utilize training programs and community activities to minimize implicit bias among their officers.

Keywords: *police, deadly force, race, implicit bias*

A Bird's Eye View of Civilians Killed by Police in 2015: Further Evidence of Implicit Bias

Policing in America is in the midst of a legitimacy crisis, having faced immense scrutiny in recent years due in large part to several highly publicized deadly force incidents captured on video (e.g., most recently, Alton Sterling in Baton Rouge, LA, and Philando Castile in Falcon Heights, MN). These videos have gone "viral" on social media and led to unprecedented levels of public discontent with the police (Weitzer, 2015). This discontent has fueled violence toward police officers: recently in Dallas, a peaceful protest turned deadly when five officers were fatally shot and another nine wounded.[1] One specific concern is that minorities are disproportionately shot and killed by the police. For example, Black Lives Matter (n.d.) has proclaimed on its website that "Black lives are systematically and intentionally targeted for demise" and "Every 28 hours a black man, woman, or child is murdered by police or vigilante law enforcement" (blacklivesmatter.com). These statements imply that the police are overtly prejudiced toward minorities – which is certainly possible but unlikely. Experimental studies, however, suggest that officers might be *implicitly* biased against minorities and more likely to use force against them as a result (i.e., the "implicit bias" effect; see Correll, Park, Judd, and Wittenbrink, 2002; Cox et al., 2014; Payne, 2001). At the same time, more recent research points to evidence of a "counter bias" effect – whereby officers appear more hesitant to use force against minorities (James, James, and Vila, 2016; James, Vila, and Klinger, 2014). Prior studies examining the relationship between civilian[2] race and police use of deadly force have produced mixed findings (Goldkamp, 1976; Jacobs and Britt, 1979; Klinger, Rosenfeld, Isom, and

[1] Ten days later, three Baton Rouge police officers were ambushed and killed. There is growing concern about a "war on cops," but a recent paper suggests that felonious killings of police officers do not appear to be increasing (Maguire, Nix, and Campbell, forthcoming).

[2] Here and throughout this paper, we use the term "civilian" to refer to individuals not employed by a law enforcement agency.

Deckard, 2015; Sorenson, Marquart, and Brock, 1993), but importantly, this line of research has either focused on single cities or used national-level data which have noted flaws (Swaine and Laughland, 2015; Williams, Bowman, and Jung, 2016). Consequently, our knowledge of race and police deadly force at the national level is limited. Although many claims have been made, three empirical questions remain unanswered: (1) How often do civilians die by police gunfire in the United States, (2) Among those shot and killed, were minority civilians less likely than white civilians to have been attacking the police or others, and (3) Among those shot and killed, were minority civilians more likely to have been unarmed than white citizens?

One reason for our absence of knowledge is the lack of national data available that would allow researchers to address adequately such questions. Ironically, it was only after the August 2014 death of Michael Brown in Ferguson that Federal Bureau of Investigation (FBI) Director James Comey became aware that his agency does not collect reliable data pertaining to civilians killed by the police (Comey, 2015). Although the FBI through Uniform Crime Reports (UCR) keeps a record of justifiable homicides (i.e., the killing of a felon by a law enforcement officer in the line of duty), reporting is voluntary and not all agencies participate. According to *The Guardian*, only 224 agencies (or about 1 percent of all agencies) reported a killing to the FBI in 2014 (Swaine and Laughland, 2015). Indeed, academic research findings also suggest that the FBI's data underestimate the prevalence of civilian deaths at the hands of police (Fyfe, 2002; Klinger, 2012; Klinger et al., 2015; Planty et al., 2015; Williams et al., 2016). Criminologists have implored the US government to develop a national database on officer-involved shootings (see, e.g., Alpert, 2015a; Fyfe, 2002; Geller and Scott, 1992; Klinger et al., 2015) – and recently proposed bills offer promise – but for now, the state of knowledge concerning police deadly force in the US remains "a national embarrassment" (Alpert, 2015b).

Although the government has failed to provide the necessary information on police shooting deaths, at least two media outlets have developed national data sets. *The Washington Post* and *The Guardian* have developed repositories of reported officer-involved shootings and other use of force incidents resulting in civilian deaths. These resources afford researchers an opportunity previously unavailable: the ability to analyze all civilian deaths at the hands of the police on a national scale over an extended period of time. The purpose of the present study is twofold: the first is to analyze the data on civilians shot and killed by police in 2015, and the second is to determine whether minority civilians shot and killed by police were more or less likely to have been (a) attacking the police, or (b) unarmed at the time of their death. Such an analysis will allow for a more informed dialogue about the extent and nature of civilian deaths at the hands of police in America. We believe it will also provide a meaningful contribution to our knowledge concerning the "implicit bias" effect, given that studies to date have relied on research carried out in laboratory settings or with data from a single agency.

Literature Review

Police Use of Force

Police use-of-force is a controversial topic with a rich history. For decades, researchers have sought to provide a better understanding of the use of force by police officers (Adams et al., 1999; Alpert and Dunham, 1997, 2004; Bayley and Garofalo, 1989; Bittner, 1970; Fridell and Lim, 2016; Fyfe, 1988; Legewie and Fagan, 2016; Klinger, 1997; Reiss, 1971; Westley, 1953). This line of research has generally examined the issue from one of four perspectives: individual (e.g., Paoline and Terrill, 2004), situational (e.g., McCluskey and Terrill, 2005), organizational (e.g., Smith, 2004), or ecological (e.g., Fridell and Lim, 2016). The individual perspective holds that there is something about particular officers (e.g., their background or outlook) that makes

them more likely to resort to using force in a given interaction (Muir, 1977). Research has consistently shown that officers with higher levels of education are less likely to use force (Lim, Fridell, and Lee, 2014; Paoline and Terrill, 2004, 2007; Terrill and Mastrofski, 2002), perhaps because these officers are better equipped to defuse a situation without having to resort to physical coercion. With respect to officer race and gender, most studies have failed to find a significant effect (Engel and Calnon, 2004; Lawton, 2007; McCluskey and Terrill, 2005). Some studies have shown that experience is negatively correlated with police use of force: those who have been in law enforcement longer appear not only less likely to use force (Paoline and Terrill, 2007), but they tend to have less favorable attitudes toward using force as well (Kop and Euwema, 2001). Other studies suggest a positive correlation between experience and certain types of force (e.g, electronic control devices – see Fridell and Lim, 2016) while still others fail to find a significant relationship between experience and use of force (Lawton, 2007; Sun and Payne, 2004). Thus, beyond the effect of officer education on use of force, the evidence pertaining to individual officer characteristics is mixed at best.

An understanding of the situational perspective shifts the focus to the suspect. Black (1976), for example, argued that the police are more likely to use coercive force against members of the lower class (e.g., the poor, minorities, youth). Suspects who are mentally ill, under the influence of drugs or alcohol, noncompliant, or otherwise disrespectful are also at a greater likelihood of having force used against them in part because the police view these suspects as more deserving of punishment (see also Van Maanen, 1974). Empirical studies have demonstrated that officers are more likely to use force when there is evidence that a crime has been committed (McCluskey and Terrill, 2005) or when the suspect is armed (Johnson, 2011), under the influence of drugs/alcohol (Engel et al., 2000), or resistant (McCluskey and Terrill,

2005). The evidence is not so clear cut with respect to gender: some studies report that the police are more likely to use force against males (Engel and Calnon, 2004; Kaminski, DiGiovanni, and Downs, 2004; Lim et al, 2014; Lim and Lee, 2015) while others indicate no relationship between the decision to use force and suspect gender (Engel et al., 2000; Lawton, 2007). Research exploring the effect of suspect race on police use of force is mixed as well. Some studies have found that minority suspects are at a greater likelihood of having force used against them (Engel and Calnon, 2004; Robin, 1963; Terrill and Mastrofski, 2002), some have found no relationship between suspect race and use of force (McCluskey and Terrill, 2005; Sun and Payne, 2004), and still others suggest that race effects wash away upon accounting for other variables such as compliance (Garner et al., 2002). Further complicating matters, some studies suggest that black suspects are more likely to resist arrest and/or be combative than white suspects (Belvedere, Worrall, and Tibbetts, 2005; Engel, 2003; Kaminski and Sorenson, 1995), which may explain any observed racial disparities in force applied by the police. Given the current state of affairs in the US, it is imperative that researchers continue to consider whether suspect race significantly influences police use of force.

The organizational perspective seeks to explain variation in officer use of force using agency-level characteristics. Police agencies – with their formal policies, standard operating procedures, and system of rewarding and disciplining officers – encourage officers to handle similar encounters in a consistent manner (Wilson, 1968). Longitudinal research conducted in single cities has shown that restrictive deadly force policies yield fewer instances of deadly force (see, e.g., Alpert, 1989; Fyfe, 1979; Sherman, 1983). Using a national probability sample of 265 agencies, Alpert and MacDonald (2001) found that agencies that required supervisors to complete use-of-force forms experienced significantly lower rates of force than agencies that

allowed officers to complete such forms on their own. Importantly, however, these authors also found that the violent crime rate exerted the strongest influence on use of force. Smith (2004) found that more "formal" agencies (i.e., those with a greater number of written rules) did not experience significantly fewer police killings; however, hours of field training required was positively associated with police killings. Again, the evidence with respect to the relationship between organizational variables and police use of force is mixed and more research is needed to help shed light on the topic.

Finally, the ecological perspective asserts that police behavior, including their decision to use force, varies according to the broader context of where the incident takes place (Bayley and Mendelsohn, 1969; Klinger, 1997; Smith, 1986; Terrill and Reisig, 2003). That is, officers are more likely to use force in areas which they perceive as more dangerous. Bayley and Mendelsohn (1969) suggested that the police are more apt to use coercion and make arrests in neighborhoods with high levels of crime, and Terrill and Reisig (2003) later demonstrated that police in two cities were more likely to use greater levels of force on suspects in neighborhoods characterized by disadvantage and high homicide rates (see also McCluskey et al., 2005; c.f. Lim et al, 2014). These effects were observed regardless of differences in officer age, education, and training. Furthermore, the relationship between suspect race and level of force used was mediated by neighborhood context. Klinger et al. (2015) found that neither economic disadvantage nor racial composition of neighborhoods influenced police shootings, but the rate of firearm violence exerted a significant curvilinear effect. That is, neighborhoods with moderate levels of firearm violence experienced the greatest number of police shootings over a 10-year span. Beyond these few studies, empirical research regarding the ecology of police force is scant.

At a minimum then, this body of research suggests that police use of force is an intricate issue with many factors potentially affecting its occurrence. Each of the four perspectives – individual, situational, organizational, and ecological – have received varying amounts of support. Up to this point, we have discussed police use of force generally. We now turn our attention to the most serious level of force: deadly force.

Deadly Police Force

Deadly force by police has been a concern for the American public for many decades (Alpert and Fridell, 1992; Goldkamp, 1976; Fyfe, 1988; Klinger, 2012) and has come to the forefront again because of several highly publicized civilian deaths (Nix and Wolfe, 2015, 2016; Pyrooz, Decker, Wolfe, and Shjarback, 2016; Wolfe and Nix, 2015). Unfortunately, we do not have a good understanding of police use of deadly force because existing national data reported by the government are flawed. Prior reviews and research have relied on either UCR data or the National Vital Statistics System (NVSS) and generally concur that police use of deadly force is positively correlated with violent crime (Jacobs and Britt, 1979; MacDonald, Kaminski, Alpert, and Tennenbaum, 2001; Sherman and Langworthy, 1979; Smith, 2003, 2004; Sorenson et al., 1993). However, subsequent research has demonstrated that both the UCR and NVSS underestimate the frequency with which civilians are killed by police. Planty et al. (2015), for example, suggests the police kill about twice as many civilians in a given year than UCR and NVSS data indicate. As such, findings from studies that have used these data must be interpreted with caution.

Furthermore, as Fyfe (1978:32) points out, *deadly force* encompasses much more than just civilian deaths at the hands of police: it is "physical force *capable* of or *likely* to kill; it does not always kill." As noted above, this is a second limitation of prior research because the police

are using deadly force every time they fire their weapon – even if the suspect is wounded and survives or the bullets miss the suspect altogether. In Miami-Dade during the mid-1980s, Alpert (1989) found that only 31% of suspects shot at were actually hit by a bullet. In St. Louis from 2003 to 2012, Klinger et al. (2015) found that police were on target only 49% of the time, and only 16% of all suspects fired at were ultimately killed.

Finally, as Klinger et al. (2015) point out, using national-level data results in aggregation bias. In their analysis of police shootings in 355 census block groups over a 10-year period, 208 blocks (58.6%) did not experience a single police shooting during that timeframe. Thus, national-level data is problematic because it masks heterogeneity within much smaller units of analysis, such as cities or census blocks. The alternative is to get a "worm's eye view" of civilians killed by police by restricting analysis to one city, a group of cities, or one state. Klinger et al. (2015) provide one of the most sophisticated studies to date using a worm's eye view, but unfortunately it is impossible to know the generalizability of their findings. Most importantly, it does not provide any insight as to how often or how many civilians are killed by police nationwide. Given the recent emergence of national-level data collected by the media and web-based crowdsourcing projects, it is important for researchers to examine the nature and extent of civilian deaths at the hands of the police.[3]

Implicit or counter bias? Much of the debate surrounding police use of deadly force in recent years centers on the impression that black civilians are disproportionately killed by the police. Many publicized incidents involve white officers and black civilians: Michael Brown in Ferguson, Walter Scott in North Charleston, Tamir Rice in Cleveland, and Philando Castile in

[3] Ironically, it was the Washington Post that conducted one of the most comprehensive studies on police shootings. On November 15, 1998, they started a series of articles evaluating police shootings in the Washington Metropolitan Police Force. See http://www.washingtonpost.com/wp-srv/local/longterm/dcpolice/deadlyforce/police1full.htm.

Falcon Heights, MN. While it is possible that some police officers harbor explicitly biased attitudes toward minorities, psychological research demonstrates that less conscious attitudes also influence police behavior (Dovidio, Glick, and Rudman, 2005; Kahn and McMahon, 2015). Smith and Alpert's (2007) report of unconscious profiling offers one possible explanation for why police would be more inclined to use deadly force against blacks. According to the researchers, police officers over time become *unconsciously* biased toward minorities through social conditioning (i.e., repeated contact with minorities involved in deviance) or illusory correlation mechanisms (as it applies here, the tendency to overestimate the correlation between race and crime; see also Hamilton and Gifford, 1976). In other words, the police – who are trained in the first place to be suspicious – become conditioned to view minorities with added suspicion.[4]

Although up to this point national data have not permitted researchers to assess adequately whether the police are more likely to use deadly force against minority civilians, experimental research exposes important insight about the "implicit bias" effect. Payne (2001), for example, randomly presented study participants with an image of a white or black face, then briefly flashed an image of either a gun or a tool. They were instructed to identify the object as a gun or a tool as quickly as possible. Results demonstrated that participants were faster to identify an object as a gun when they had been primed with a black face than when they had been primed with a white face. They were also more likely to identify tools mistakenly as guns when they had been shown a black face. In a separate study, undergraduate students played a videogame whereby they were randomly presented with 1 of 4 images: a white man holding a gun, a white man holding some other object, a black man holding a gun, or a black man holding some other

[4] For a review of prejudice and racial profiling more broadly, see Wilson, Dunham, and Alpert (2004).

object. The participants were instructed to determine quickly whether the man was holding a gun or not and react by quickly pressing a "shoot" or "don't shoot" button as quickly as possible. Findings included that participants shot more quickly at armed black men than armed white men, and decided not to shoot unarmed whites more quickly than unarmed blacks (Correll et al., 2002).

These studies suggest that race (or color) is an important factor in determining whether a suspect is perceived to be a threat and in turn, whether or not to shoot the person. However, the participants in these studies were college students and the findings might not be generalizable to police officers – who should be trained extensively on how to assess and respond to threats. Moreover, pressing one of two keyboard buttons to simulate the decision to shoot or not shoot is a far cry from pulling the trigger of a gun.[5]

That said, Cox and colleagues (2014) addressed these limitations by randomly assigning 54 police officers to complete a shooter simulation (using a realistic gun) in one of two neighborhoods: the first a predominantly non-white, high-crime neighborhood, and the other a predominantly white, low-crime neighborhood. Officers were told they were responding to a call with armed criminals nearby, and then presented with a series of pictures and video simulations. Results indicate that officers were faster to shoot armed black suspects in the picture trials but slower to shoot them in video trials – presumably because they had a longer response window and therefore more time to exercise caution. Studies by James and colleagues (2014, 2016) provide further evidence of a "reverse racism" or "counter bias" effect – meaning that officers are in fact more *hesitant* to use force against minorities for fear of the media backlash it could create. In these studies, police officers completed a simulator that involved "highly realistic,

[5] It is also important to mention that research has consistently shown that violent video games increase aggressive behavior in young adults (see Anderson and Bushman, 2001).

custom-made, high-definition video scenarios" which "depicted domestic disturbances, vehicle stops, robberies in progress, and investigations of suspicious persons/circumstances" (James et al., 2016:7). Participating officers were armed with a modified Glock model 22s, which had infrared emitters that registered shot placement on the video screen and the exact time (in milliseconds) the officer pulled the trigger. The researchers found that officers were slower to shoot armed Black suspects than armed White suspects, and less likely to shoot unarmed Black suspects than unarmed White suspects.[6]

Collectively, the research results leave us with more questions than answers. There are sound theoretical principles to consider that black civilians are disproportionately considered a threat by the police (Smith and Alpert, 2007), but empirical support for the implicit bias effect is mixed (Correll et al., 2002; Cox et al., 2014; James et al., 2014, 2016; Payne, 2001). Previous research findings have left us with the critical questions: 1) how often civilians are killed by the police, and 2) whether or not minority civilians are more likely than white civilians to pose a threat to police – by attacking them and/or being armed with a deadly weapon.

The Current Study

The primary contribution of the present study is that it represents one of the first analyses of civilians shot and killed by police using national-level data other than the data from the UCR or NVSS. Using data collected by *The Washington Post*, we were able to provide a breakdown of the characteristics of deadly shootings that occurred in 2015.[7] Second, we use these data to consider whether minority civilians killed by police gunfire were more likely to have *not* been attacking the police or more likely to have been unarmed at the time of their death – which,

[6] Interestingly, these studies were completed *before* Michael Brown's death in Ferguson in 2014.
[7] Unfortunately, these data are limited to police shootings that resulted in the death of a civilian. Ideally, we would like to be able to investigate each instance in which a police officer decided to pull the trigger, but to date, this the best available data pertaining to police shootings at the national level.

based on prior literature, would suggest implicit bias on the part of the police. Prior studies exploring the implicit bias effect have relied on simulation data or single-agency use of force data. Officers who participate in simulation studies are not in any real danger and in fact might exert more caution in "shooting" minority suspects simply because they do not want to be labeled prejudiced by their command staff. Our analysis provides insight as to whether the implicit bias effect manifests itself in the real world where officer safety is an immediate concern. While we were unable to determine whether officers were quicker or more likely to fire their weapon at minority suspects, we argue that if minorities were more likely to have *not* been attacking the police/other civilians, or more likely to have been unarmed, this would indicate the police exhibit implicit bias by falsely perceiving minorities to be a greater threat to their safety (i.e., threat perception failures; see Fachner and Carter, 2015). Specifically, we sought to answer the following three research questions with the current study:

R1: *What are the individual, city, and agency level characteristics of all civilians fatally shot by police in 2015?*

R2: *Among those fatally shot, were minority civilians more likely than white civilians to have <u>not</u> been attacking the police or other civilians?*

R3: *Among those fatally shot, were minority civilians more likely than white civilians to have been unarmed?*

Methods

Data

Data analyzed in the current study were ascertained from three sources. The primary data source is *The Washington Post*'s National Police Shooting Database. In 2015, *The Post* began compiling data on the characteristics of incidents in which a civilian was shot and killed by the

police in the United States. The data were collected by a team of journalists employed by *The Post* who scoured web-based news articles, public records, internet databases, and civilian reports to identify all civilians killed by a firearm, discharged by an officer acting in the line of duty, in 2015.[8] These data are one of the first nationally representative samples of persons killed by the police[9] and contain baseline information on 990 incidents including the demographics of civilians killed (e.g., age, race, mental illness), circumstances surrounding the event (e.g., civilian armed/unarmed, threat level), the agency responsible for the shooting, and the location of the event.[10] The 2012 Uniform Crime Report (UCR) and the 2008 Census of State and Local Law Enforcement Agencies (CSLLEA) were used to obtain additional data pertaining to city- and agency-level characteristics.

Dependent Variables

Research on police use of deadly force at the national level has typically analyzed official data (e.g., UCR, NVSS) to examine the impact of agency- and city-level variables on the aggregate number of civilians killed by police agencies (Smith, 2003, 2004). Using *The Post* data, we additionally examined two unique dependent variables that serve as indicators of threat

[8] An anonymous reviewer suggested that *The Post's* database may be biased due to missing cases. While it is certainly possible that *The Post* did not identify every single fatal shooting, it should be noted that their total number of deadly shootings aligns very closely with other databases such as that of *The Guardian.* Those compiling the data were tasked with collecting data on *all* fatal shootings – not simply those that were highly publicized. Indeed, *The Washington Post* was awarded a Pulitzer Prize in early 2016 for the collection and publication of their data. They have also committed to collecting data through 2016. See https://www.washingtonpost.com/graphics/2016/pulitzer-prize-winner-and-finalist/.

[9] Other endeavors to collect data on persons killed by the police have been undertaken by *The Guardian's* "The Counted" project, as well as killedbypolice.net and fatalencounters.org, both crowd-sourcing projects. Both sources include *all* deaths caused by both *on-* and *off-duty* police officers, including deaths that resulted from being struck by police vehicles, Tasers, deaths in custody, firearms, and other actions by the police contributing to citizen deaths. While these data sources provide a comprehensive picture of police involved deaths, *The Post's* data are unique in that they only include cases in which citizens were killed by *on-duty* police officers who intended to use deadly force.

[10] While perceived threat level on the part of the officer involved is part of the equation to determine whether a shooting is justified, we are primarily limited to the information gleaned from news reports by *The Post's* research team. Note also that no data pertaining to the demographic characteristics of the officers involved in each shooting were compiled.

perception failure. First, we examined whether civilians shot and killed by the police were attacking law enforcement or another civilian prior to their death. This variable was created using information collected by *The Post's* research team indicating the level of threat posed by civilians immediately before their demise. To gather this information, several members of *The Post's* research team reviewed each incident and attempted to reach consensus on whether an attack was in progress based on information ascertained from online news resources (e.g., news articles), statements made by public officials, and, when necessary, phone calls to police officials. Specifically, the team collected data regarding whether civilians were: (a) firing a gun at a person (police officers or other civilians), (b) attacking with non-gun weapons, (c) pointing/brandishing a firearm, (d) posing other threats (e.g., brandishing a knife/sharp object, refusing to drop a non-gun weapon, driving a vehicle at a person, moving quickly/lunging toward an officer without a deadly weapon), (e) making furtive movements, (f) fleeing, or (g) accidentally shot by police.[11] These categories were hierarchical, such that the team members started with "firing a gun" and worked their way down – assigning the first category that applied to each incident. In a small number of cases, *The Post* could not reach consensus – these cases were deemed an undetermined threat level. For the present study, incidents were coded as an *attack* if, prior to their demise, civilians were: firing a weapon at a person, attacking with non-gun weapons, or pointing/brandishing a firearm. *Non-attack* is a dichotomous measure of whether or not an incident fit into one of these three categories (1 = *non-attack*, 0 = *attack*).

[11] While the behaviors included in item *d* certainly represent a threat to officers or others, we argue they do not constitute an attack. The threat posed is less imminent than those behaviors in items *a* through *c*, and it is therefore feasible that officers may have been able to use less than lethal force in these situations. As an example, officers are discouraged from shooting into vehicles because of the dangerousness of doing so and the ease with which they could sidestep the vehicle in most scenarios. Yet just to be sure, we ran supplementary analyses whereby the cases included in item *d* were placed in the attack category. Results remained substantively the same, even when correcting for potential small-sample bias and using multiple missing data imputation methods (available upon request).

Second, we examined whether or not civilians were armed with a deadly weapon at the time of their death. *The Post* coded civilians as armed when they were in possession of a firearm, knife, sharp object, or some other deadly weapon (e.g., blunt object). Based on this information we operationalized *unarmed* as a dichotomous variable (1 = *unarmed*, 0 = *armed*).[12]

Independent Variables

Civilian race/ethnicity. Our key independent variable was the race/ethnicity of civilians killed by the police. Prior research carried out with single-agency data has produced mixed results concerning police officer bias: some studies provide evidence of implicit bias, whereby officers perceive minorities as a greater threat (Correll et al., 2002; Cox et al., 2014, Fridell and Lim, 2016; Payne, 2001), but others point to a counter bias effect whereby officers are more hesitant to use force against minorities (James et al., 2014; James et al., 2016). To assess the relationship between race/ethnicity and our measures of threat perception failure (i.e., the dependent variables *non-attack* and *unarmed*), we created two dummy variables – *Black* and *Other race/ethnicity* (e.g., Hispanic/Latino, Asian, Pacific Islander, Mixed) – with *White* serving as the reference category. Significant race effects would be indicative of implicit bias in fatal shootings by police officers in 2015.

Control Variables

We also included several variables in our multivariate statistical models as control variables to maximize the likelihood of generating unbiased estimates. Control variables included in the analysis were grouped into three categories: (a) civilian characteristics, (b) city characteristics, and (c) agency characteristics.

[12] Note that civilians who grabbed an officer's firearm were coded as armed.

Civilian characteristics. We controlled for three civilian characteristics: civilian age, whether or not the civilian displayed signs of mental illness, and whether the civilian was armed/attacking the officer(s) or others.[13] *Age* was measured continuously, while *mental illness* was measured dichotomously (1 = displayed signs of mental illness). *Armed* (1 = yes) and *attack* (1 = yes) are also measured dichotomously.

City and agency characteristics. Based on prior literature, we would expect police shootings to be impacted by regional characteristics, violent crime rates, the size of the city/jurisdiction, and agency characteristics (Smith, 2003, 2004). Accordingly, we controlled for UCR region with three dummy variables: *Northeast*, *Midwest*, and *West* (*South* serves as the reference category due to its larger population, higher levels of violent crime, and the role of race in its history). The violent crime rate per 100,000 residents for each jurisdiction was also obtained from the 2012 UCR[14] and was measured using two dummy variables for *moderate crime* (1 = 25th to 74th percentile) and *high crime* (1 = 75th percentile or higher; *low crime* [below the 25th percentile] serves as the reference category).[15] With respect to jurisdiction size, *large city* was a dichotomous variable indicating that the jurisdiction had a population of 100,000 or more residents. Finally, we used data from the CSLLEA to control for agency size and whether an agency operated its own training academy. *Large agency* indicated that the officer involved in the shooting was employed by an agency with 1,000 or more full-time sworn police officers and *In-house academy* (1 = yes) indicated that the involved officer's agency operates its own training

[13] That is, in the regression model that uses *unarmed* as the dependent variable, we control for whether the civilian was attacking the officer(s) or others. In the regression model that uses *non-attack* as the dependent variable, we control for whether the civilian was armed. Note also that given the very small number of females present in the data, and consistent with reviewer recommendations, we elected not to control for gender.

[14] Four UCR measures were used to create the violent crime rate variable: (1) robbery, (2) aggravated assault, (3) forcible rape, and (4) murder.

[15] We realize this only allowed us to compare the 990 incidents to each other in terms of the various jurisdictional crime rates, but think it provides useful information nonetheless – allowing us to determine whether, for example, civilians were more likely to attack officers or be armed in jurisdictions with higher rates of violent crime.

academy (as these academies typically exceed state-mandated minimum hours, and prior research suggests officers who undergo more hours of training are less likely to use force – see Lim et al., 2014).

Analytic Strategy

Our analyses proceeded in two steps. First, to provide a comprehensive examination of civilian, city, and agency-level characteristics of all civilians killed by police gunfire in 2015, we present descriptive univariate statistics. This descriptive analysis was critical because to the best of our knowledge this was the first study that used *The Washington Post* data to provide a baseline understanding of the characteristics surrounding incidents in which civilians were shot and killed by police. Second, because our measures of threat perception failure - *non-attack* and *unarmed* - are dichotomous, we estimated two multivariate logistic regression models using StataSE 14. These analyses allowed us to provide context to the most controversial police shootings – when civilians did not pose an imminent threat to law enforcement or others. We first examined whether race was associated with the likelihood of a civilian having *not attacked* the officer(s) or other civilian(s), net of control variables. Then, we estimated a second logistic model which regressed our race and control variables onto the *unarmed* dependent variable. In short, these analyses examined whether race was significantly associated with our measures of threat perception failure (as significant race effects would be suggestive of implicit bias) net of other theoretically important factors.[16]

[16] Similar to prior studies (e.g., Legewie and Fagan, 2016; Smith, 2003, 2004), we employed listwise deletion to handle cases with missing race, UCR and/or CSLLEA data, and as such, the sample was reduced to N =599. However, to check the robustness of our findings, we performed supplementary analyses – first using hot deck imputation (Myers, 2011) and again using multiple imputation with chained equations (White, Royston, and Wood, 2011). The results remained substantively the same and are available upon request.

Several diagnostic tests revealed that no harmful levels of collinearity were present in the multivariate models discussed below. First, all bivariate correlations fell below an absolute value of .70 (Tabachnick and Fidell, 2007). Second, all variance inflation factors from the multivariate models fell below 2.1, well below the recommended threshold of 4.0 (Tabachnick and Fidell, 2007). Finally, all condition indices fell below the recommended threshold of 30 (Belsely, Kuh, and Welsch, 1980; Mason and Perrault, 1991).

Results

The first step of our analysis was to provide an in-depth understanding of deadly police shootings on a national scale. Table 1 displays the characteristics of the 990 police fatal shootings that occurred in the US in 2015.[17] Most of the civilians shot and killed were male (95.8%), white (50.0%), and between the ages of 25 and 34 (31.4%; mean = 36.7). Just under half of these deadly shootings occurred in the south (42.8%). The overwhelming majority of civilians shot and killed were armed with a deadly weapon (82.4%),[18] but it should be noted that 93 civilians (or 9.4%) were unarmed. Nearly three-fourths of these civilians were attacking the officer(s) or other civilians at the time of the deadly shooting – either firing a gun (27.7%), attacking officers without a gun (e.g., physically assaulting them, 15.7%), or pointing/brandishing a gun (30.4%). Less severe threats to officer/public safety included brandishing or refusing to drop non-gun weapons (16.5%) and furtive movements (3.5%). A small number of civilians who were shot and killed were either fleeing (1.1%) or accidentally shot (0.7%). About 1 in every 4 of these civilians displayed signs of mental illness.

(TABLE 1 ABOUT HERE)

[17] The total was 990 as of February 15, 2016.
[18] Note that 33 individuals in this category were in possession of a toy/replica firearm.

Table 2 provides information about city and agency-level characteristics of the deadly shootings. Over 700 different agencies were involved in at least 1 shooting – the majority of which were municipal agencies (60.7%).[19] Just over 25% of the 990 deadly shootings involved officers working for agencies that employ 1,000 or more full-time officers, while 43.8% of these incidents involved officers employed by agencies that operate their own basic training academy. Almost 60% of fatal shootings in 2015 occurred in a jurisdiction with 100,000 or more residents. Finally, as previously mentioned we split the shootings into three categories according to their crime rate according to the 2012 UCR. Roughly 18% of the deadly shootings involved officers employed in jurisdictions with *high crime,* while about 33% and 17% involved officers employed in jurisdictions with *moderate* and *low crime*, respectively.

(TABLE 2 ABOUT HERE)

The next step of our analysis was to determine whether the data provided evidence of implicit bias. Table 3 provides a closer look at the intersection of race and (1) whether the civilian was armed or unarmed, and (2) whether the civilian was attacking the officer/other civilians or not. Fifteen percent of black civilians shot and killed by police last year were unarmed at the time of their death (Phi coefficient [φ] = .10, $p < .01$), compared to 6% of white civilians (φ = .11, $p < .01$) and 11% of other civilians (φ = .02, $p = .47$). In fact, although roughly twice as many white civilians died by police gunfire as black civilians (495 vs. 258), *more unarmed black civilians (38) were shot and killed than white civilians (32).* Similar findings emerged with respect to threat level: 29% of black civilians (φ = .04, $p = .25$) and 38% of civilians from other racial/ethnic groups (φ = .13, $p < .01$) were *not* attacking the officer(s) or other civilians, while the same was true of about 20% of white civilians (φ = .14, $p < .01$). These

[19] Note that many agencies were involved in multiple deadly shootings (e.g., the Los Angeles Police Department was involved in 21 over the course of the year).

simplistic findings provided preliminary evidence of an implicit bias effect, but they did not permit us to rule out the potential confounding influence of other relevant variables.

(TABLE 3 ABOUT HERE)

Accordingly, we next used multivariate regression models to predict our two measures of threat perception failure (see Table 4 for descriptive statistics of all variables used in this analysis).[20] Table 5 presents the results from a logistic model that regressed *non-attack* onto our two race variables along with eleven control variables that accounted for the potential confounding influences of whether the civilian was armed, age, mental illness, region, crime, size of jurisdiction, size of agency, and whether or not the officer involved was employed by an agency that operates its own basic training academy. The model was statistically significant (Wald $\chi^2 = 133.05$, $p < .01$) and explained roughly 11 percent of the variance in the outcome. In terms of race/ethnicity, civilians from other racial/ethnic groups were significantly *more* likely than whites to have been in the *non-attack* group ($b = .81$, $p < .01$). The odds ratio reveals they were a little more than twice as likely as white civilians to have *not* been attacking the officer(s) or other civilians. The *black* coefficient is positive but statistically non-significant, meaning black civilians were no more or less likely than white civilians to have been attacking the officer(s) or other civilians when they were fatally shot by police. These results provide support for an implicit bias effect with respect to non-black minority groups. That is, civilians of other races/ethnicities were significantly more likely than whites to have been fatally shot due to an apparent threat perception failure.

(TABLE 4 ABOUT HERE)

(TABLE 5 ABOUT HERE)

[20] Note that 44 cases deemed "undetermined threat" were excluded from these analyses.

Our final multivariate analysis explored the factors associated with civilians having been unarmed at the time they were shot and killed by the police. Table 6 presents the results from a logistic model that regressed *unarmed* onto the race variables along with several controls. The model as a whole was statistically significant (Wald $\chi^2 = 115.86$, $p < .01$) and explained roughly 19 percent of the variance in the outcome. Black civilians ($b = .88$, $p < .10$) were significantly *more* likely than white civilians to have been unarmed when they were shot and killed by police, net of other factors. Indeed, the odds ratio indicates that black civilians who died by police gunfire were more than twice as likely as whites to have been unarmed, holding all else constant.[21] This is further evidence of implicit bias, as race was again significantly associated with one of our indicators of threat perception failure.

(TABLE 6 ABOUT HERE)

Discussion

Police use of force, particularly deadly force, has again moved to the forefront of national debate on police practices. In the wake of controversial killings of unarmed black civilians (e.g., Michael Brown, Freddie Gray, and Philando Castile to name a few), awareness groups such as Black Lives Matter and Campaign Zero have been formed by activists who allege that minorities are more likely than whites to be victims of unjust police force. Their suppositions claim the police are overtly prejudiced against minority groups, that minorities are over-represented in criminal activity or in areas that receive saturated levels of police patrol, or perhaps that police are biased against minorities. Unfortunately, empirical research on police use of deadly force at

[21] An anonymous reviewer pointed out that our regression model predicting *unarmed* may suffer from small-sample bias (i.e., a small number of cases in the "unarmed" category). We re-ran this model using *firthlogit* (available in Stata 14), a penalized maximum likelihood estimation method which has been shown to reduce small-sample bias (Firth, 1993; Heinze and Schemper, 2002). The results were substantively unchanged – black civilians remained significantly more likely than white civilians to have been unarmed prior to their demise. The results of this analysis are available upon request.

the national level has been plagued by unreliable data to assess accurately how often the police shoot and kill civilians, and whether or not minorities are unjustly killed by police at a higher rate than whites. The present study examined these issues using data collected by *The Washington Post* on all civilians who were shot and killed by police officers in 2015, and some of the findings warrant further discussion.

The Post's data indicate that 990 civilians were shot and killed by police officers in the line of duty last year. According to the Bureau of Justice Statistics, the police make contact with more than 40 million people each year. Out of these contacts, police force (or threatened force) is used in less than 2% of these interactions (Eith and Durose, 2011). Moreover, research indicates that the vast majority of use-of-force incidents do not result in a death – even when the police fire their guns (Alpert, 1989; Klinger, 2012; Klinger et al., 2015). Thus, civilian deaths caused by police officers are extremely rare based on the overall number of police-civilian encounters. Additionally, the current analysis indicates that the majority of civilians killed by police were armed with a deadly weapon or were actively attacking officers. Less than 10% (N = 93) of civilians shot and killed by police in 2015 were unarmed.

Mainstream media and advocacy groups – most notably Black Lives Matter and Campaign Zero – have alleged that police disproportionately use force and deadly force against minorities. *The Post* data showed that police killed almost twice as many whites as blacks; however, this is expected as whites far outnumber blacks in the United States population. In an effort to standardize these numbers, *The Guardian* divides the number of white and black civilians killed by their respective population count. Presenting the number in this manner suggests that blacks were killed at more than twice the rate of whites in 2015 (7.2 per million to 2.9 per million respectively). Similarly, *The Washington Post* recently stated "When adjusted by

population, [unarmed black men] were seven times as likely as unarmed white men to die from police gunfire" (Lowery, 2016). We caution against using population as a benchmark because it does not account for each groups' representation in a variety of more relevant measures, including police-civilian interactions and crime. Criminological research utilizing self-report data indicates that black citizens offend at higher rates (Blumstein, Cohen, Roth, and Visher, 1986; Loeber et al., 2015), and are overrepresented in citizen complaints/calls for service (Engel, Smith, and Cullen, 2012), police stops (Novak, 2004) and arrests (Brame, Bushway, Patternoster, and Turner 2014; Kochel, Wilson, and Mastrofski, 2011). These and related benchmarks can be used to clarify the representation of minority deaths at the hands of police.

To this point, we echo the sentiments of scholars who have argued that a national use of force database is needed to examine these issues (Alpert, 2015a, 2015b; Klinger, 2012; Klinger et al., 2015). Not just force that has resulted in death – which is what *The Post* and *The Guardian* have provided – but *all use of force incidents*. Collecting these data would contribute to a more informed discussion about whether the police disproportionately use force against minorities in all contexts. Recently, the FBI announced that it will begin compiling data similar to *The Post* and *The Guardian* databases, but we argue they should take the next step and track all use of force incidents. Further, they should not only collect offender characteristics – but officer characteristics as well (e.g., race, age, gender, rank, education, complaint history). Yet agencies have historically been reluctant to make their use of force data public, despite criminologists imploring them to do so for decades. Perhaps police leaders and politicians are concerned about the backlash that could result if their data uncover evidence of bias or excessive force. Whatever the case may be, the government may need to provide funding incentives in order to increase

participation. Without more comprehensive data, we simply cannot determine whether the police disproportionately use force against minorities on a national scale.

Although we were limited to the 990 police shootings that resulted in death, we were able to analyze the data for evidence of implicit bias. Our findings showed that citizens in the *other* racial/ethnic group were significantly more likely than whites to have *not* been attacking the officer(s) or other civilians, and blacks were more than twice as likely as whites to have been unarmed when they were shot and killed by police. These findings suggest evidence of implicit bias in real-world scenarios. In line with previous police shooting simulation studies (see Correll et al., 2002; Payne, 2001; Cox et al., 2014), it appears that officers may have been more likely to experience threat perception failures in fatal shootings that involved minority civilians. That is, officers subconsciously perceived minority civilians to have been a greater threat than they were (Fachner and Carter, 2015).

Our results have several relevant implications for policy and practice (for excellent reviews see Fridell, 2016; James, Fridell, and Straub, 2016; Spencer, Charbonneau, and Glaser, 2016). Though it might seem difficult or even impossible to overcome prejudices that operate on a subconscious level, research suggests that agencies can potentially reduce bias in a number of different ways – including, for example, intergroup contact (Allport, 1954). Reducing bias through contact requires that groups cooperate, have equal status and similar goals, and have the support of authorities, laws, or customs. A recent meta-analysis by Pettigrew and Tropp (2006) provides strong evidence that intergroup contact can reduce prejudice – 94 percent of the 696 samples they examined showed "an inverse relationship between intergroup contact and prejudice" (p. 766). Thus, police agencies might regularly sponsor activities that put the police in direct, *positive* contact with citizens – such as citizen-police softball tournaments or

neighborhood block parties – which would permit officers to interact with minority citizens in an informal atmosphere. Alpert and Dunham (1998) suggested such a program, called Neighborhood Intervention and Community Evaluation (Miami NICE) in the late 1980s to help heal the wounds from civil disturbances (see also Duda, Klofas, and Drake, 2011). Community policing activities such as these are often viewed as a means of increasing citizen satisfaction, yet they have the added benefit of exposing officers to citizens *not* engaged in deviance. Relatedly, research has shown that bias can be reduced via exposure to counter-stereotypic exemplars. Park and Glaser (2011), for example, found that after officers performed a modified shooting simulation which involved more armed White targets and unarmed Black targets, they demonstrated less bias on subsequent simulations. Finally, agencies could consider having their officers practice stereotype negation, which simply involves saying "no" in response to words or phrases consistent with racial stereotypes (e.g., "black citizens are dangerous") and "yes" to words or phrases *inconsistent* with racial stereotypes (Kawakami, Dovidio, Moll, Hermsen, and Russin, 2000).

Agencies would also be wise to implement procedural justice training for their officers, as research has consistently demonstrated that procedural justice is the key to building trust and legitimacy in the eyes of the public (see, e.g., Jackson, Bradford, Stanko, and Hohl, 2012; Tyler, 1990; Wolfe, Nix, Kaminski, and Rojek, 2016). When citizens view the police as a legitimate authority, they are more likely to exhibit compliant behaviors (Murphy, Tyler, and Curtis 2009; Papachristos, Meares, and Fagan, 2012), cooperate (Jackson et al., 2012), and accept police decisions both in the short- (Tyler and Huo, 2002) and long-term (Tyler, Sherman, Strang, Barnes, and Woods, 2007). Every police-citizen interaction represents a teachable moment for both parties, whereby citizens will judge how fairly they have been treated and officers will

interpret citizens' responses to their actions (Bottoms and Tankebe, 2012; Tyler, 2011). Thus, it is imperative that the police emphasize procedural justice at every possible juncture. Indeed, many situations which escalate into the use of deadly force could perhaps be defused through procedural justice. For example, Owens, Weisburd, Alpert, and Amendola (2016) recently conducted an experiment in which they successfully implemented a low-cost procedural justice-centered training of officers in Seattle. Results indicated that trained officers were less likely to resolve incidents with arrest or force. Other research carried out in Greater Manchester suggests that officers who received procedural justice training reported more favorable attitudes toward using procedural justice in the field and subsequently had improved interactions with citizens (Wheller, Quinton, Fildes, and Mills, 2013). It is feasible that increased usage of procedural justice in the field could reduce the number of fatal encounters between officers and the public in the long-term.

Departments could also benefit from adopting body-worn cameras (BWCs) (Jennings, Fridell, and Lynch, 2014; Katz, Choate, Ready, and Nuňo, 2014). Research suggests that body worn cameras increase police transparency and legitimacy in the public eye, with some studies suggesting that officers believe BWCs would improve their interactions with civilians (see Jennings et al., 2014). Indeed, using a randomized-controlled trial conducted in the Rialto Police Department, researchers demonstrated that officers wearing BWCs were less likely to use force against citizens and less likely to have complaints filed against them than officers not equipped with BWCs (Ariel, Farrar, and Sutherland, 2015). Body-worn camera footage furthermore affords police agencies the opportunity to tell their side of the story following use of force incidents and review cases when complaints are lodged by citizens. As such, BWCs could aid in the development and maintenance of early warning systems meant to flag problematic behavior

by officers (Walker, Alpert, and Kenney, 2000). Although there are certainly barriers to outfitting officers with BWCs – not the least of which are the costs associated with storing video footage and the fact that the footage is often limited – police leaders may find them a helpful tool in reducing/removing bias from within their ranks.

Limitations

This study is not without limitations. Most importantly, we only had data for the 990 police shooting incidents *that resulted in death*. It would be ideal to have national data on use of force incidents that did not result in death as well, as prior studies suggest that civilian death only occurs in 15 to 25 percent of all police shootings (see e.g., Klinger et al., 2015). With these data, we could more accurately assess whether deadly force is disproportionately used against blacks, and we could more accurately determine whether implicit bias occurs in real-world police-civilian interactions. Additionally, we were only able to analyze data for a one-year period. Future research would benefit from longitudinal data to assess police shooting trends over longer periods. This is especially important considering that 2015 was a period of great turmoil in American policing and might prove to be an outlier over a more extended timeframe. Note, however, that a recent study by Williams et al. (2016) suggests that annual totals of fatal police shootings have remained relatively stable over the last five years. In any event, given the national debate currently surrounding police shootings, it was imperative to objectively analyze the first year of *The Post's* data in order to shed light on any apparent racial disparities. Finally, although we were able to control for the influence of several relevant variables, we could not account for everything – as evidenced by the modest amount of variance explained by our regression models. For example, suspect death can be influenced by factors such as departmental policy on rendering lifesaving aid or the proximity of level-one trauma centers (Giacopassi, Sparger, and

Stein, 1992; Hanke and Gundlach, 1995; MacKenzie et al., 2006). Yet without national data on non-fatal police shootings, we are unable to determine whether the observed race effects would be washed away by the inclusion of these other variables.

Conclusion

Our analysis has contributed to an understanding of the extent to which civilians were fatally shot and killed by police in the US in 2015, and the extent to which race was associated with two measures of threat perception failure: having *not* been attacking the police or other citizens, and having been unarmed prior to being fatally shot. Empirical studies on police deadly force at the national level have been limited by flawed data far too long. News media outlets have provided us with more accurate data on these incidents than the research community, however, more is needed to provide reliable and generalizable analyses of police involved shootings. Fortunately, it appears that we are making steps in the right direction, and this study and the data from the Washington Post serve as baseline analyses for future research on civilians killed by police.

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Table 1. Characteristics of all civilians involved in fatal police shootings in 2015 (*N* = 990).

	N	%
Civilian Gender		
Male	948	95.8
Female	42	4.2
Civilian Race		
White	495	50.0
Black	258	26.1
Other	210	21.2
Unknown	27	2.7
Civilian Age		
Under 18	18	1.8
18 – 24	163	16.5
25 – 34	311	31.4
35 – 44	210	21.2
45 or older	277	28.0
Unknown	11	1.1
UCR Region[a, b]		
Northeast	68	6.9
Midwest	136	13.7
South	424	42.8
West	362	36.6
Civilian Armed With		
Deadly weapon[c]	816	82.4
Vehicle	54	5.5
Unarmed	93	9.4
Unknown	27	2.7
Threat level		
Firing a gun	274	27.7
Attacking with non-gun weapons	155	15.7
Pointing/brandishing a gun	301	30.4
Other threats (e.g., brandishing knife, refusing to drop a weapon, driving vehicle at a person, moving quickly toward an officer)	163	16.5
Furtive movement	35	3.5
Fleeing	11	1.1
Suspect accidentally shot	7	0.7
Undetermined	44	4.4
Civilian showed Signs of Mental Illness		
Yes	248	25.0
No	742	75.0

[a] Note there are 9 states in the Northeast, 12 in the Midwest, 18 in the South (including Washington, DC), and 13 in the West.

[b] The approximate population of each region according to 2012 US Census Bureau estimates are as follows: Northeast, 55.8 million; Midwest, 67.3 million; South, 117.3 million; and West, 73.6 million.

[c] This category includes 33 individuals who were armed with a toy/replica gun.

Table 2. City and agency-level characteristics of fatal police shootings in 2015 (*N* = 990).

	N	%
Agency Type		
Municipal	601	60.7
Sheriff	227	22.9
State	44	4.4
Federal	14	1.4
Multiple agencies	82	8.3
Other	16	1.6
Unknown	6	0.6
Crime rate		
High	176	17.8
Moderate	331	33.4
Low	170	17.2
UCR data not available	313	31.6
Jurisdiction Size		
100,000 or more residents	413	41.7
Fewer than 100,000 residents	292	29.5
UCR data not available	285	28.8
Agency Size		
1,000 or more full-time officers	259	26.2
Fewer than 1,000 full-time officers	676	68.3
CSLLEA data not available	55	5.6
Agency operates its own basic training academy		
Yes	406	41.0
No	520	52.5
CSLLEA data not available	64	6.5

Table 3. Cross-tabulations of citizen race with armed/unarmed and attack/non-attack.[a]

	White	Black	Other	Total
Armed	463	220	187	870
Unarmed	32	38	23	93
Total	**495**	**258**	**210**	**963**
Attack	395	183	131	709
Non-attack	83	63	66	212
Undetermined[b]	17	12	13	42
Total	**495**	**258**	**210**	**963**

[a] Twenty-seven cases are excluded from this table due to missing race information.
[b] Cases involving an undetermined threat level were excluded from multivariate regression models.

Table 4. Descriptive statistics for variables used in regression equations (N = 599).

	Mean	SD	Min	Max
Dependent variables				
Non-attack	.26	--	0	1
Unarmed	.09	--	0	1
Independent variables				
Black	.29	--	0	1
Other race	.25	--	0	1
Controls				
Armed [a]	.91	--	0	1
Attack [b]	.74	--	0	1
Age	35.7	12.3	15	83
Mental illness	.26	--	0	1
Northeast	.07	--	0	1
Midwest	.12	--	0	1
West	.41	--	0	1
High crime	.25	--	0	1
Moderate crime	.50	--	0	1
Large city	.60	--	0	1
Large agency	.33	--	0	1
In-house basic	.50	--	0	1

[a] This variable is only used as a control in the regression model predicting *non-attack.*
[b] This variable is only used as a control in the regression model predicting *unarmed*.

Table 5. Logistic regression model predicting whether fatally shot civilian was *not* attacking the officer(s) or other individuals.

	Not attacking		
	b	SE	OR
Black	.36	.24	1.43
Other	.81***	.25	2.26
Armed	-2.23***	.47	.11
Age	.01	.01	1.01
Mental illness	.63***	.19	1.88
Northeast	-.27	.26	.77
Midwest	-.07	.33	.94
West	.11	.22	1.12
High crime	-.60	.43	.55
Moderate crime	-.51**	.21	.60
Large city	.14	.44	1.15
Large agency	.18	.31	1.20
In-house basic	.11	.38	1.12
Intercept	.21	.59	---
N		599	
Wald χ^2		133.05***	
McFadden's R^2		.11	

Note: Entries are unstandardized regression coefficients (*b*), robust standard errors adjusted for clusters in 48 states, and odds ratios (OR); * $p < .10$, ** $p < .05$, *** $p < .01$

Table 6. Logistic regression model predicting whether fatally shot civilian was unarmed.

	Unarmed		
	b	SE	OR
Black	0.88*	0.46	2.41
Other	0.11	0.50	1.12
Attack	-2.27**	0.47	0.10
Age	-0.02	0.01	0.98
Mental illness	-0.40	0.38	0.67
Northeast	0.19	0.67	1.20
Midwest	0.62	0.48	1.85
West	0.08	0.52	1.09
High crime	0.28	0.42	1.33
Moderate crime	0.56*	0.34	1.76
Large city	-0.17	0.66	0.84
Large agency	-0.35	0.40	0.70
In-house basic	0.40	0.47	1.50
Intercept	-1.10	0.67	---
N		599	
Wald χ^2		115.86***	
McFadden's R^2		.19	

Note: Entries are unstandardized regression coefficients (*b*), robust standard errors adjusted for clusters in 48 states, and odds ratios (OR); * $p < .10$, ** $p < .05$, *** $p < .01$