Economics, Law and Policy
ISSN 2576-2060 (Print) ISSN 2576-2052 (Online)
Vol. 4, No. 2, 2021
www.scholink.org/ojs/index.php/elp

Original Paper

Do White Police Officers Unfairly Target Black Suspects?

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Received: August 26, 2021 Accepted: September 17, 2021 Online Published: January 4, 2022

doi:10.22158/elp.v4n2p12 URL: http://dx.doi.org/10.22158/elp.v4n2p12

Abstract

Using a unique data set we link the race of police officers who kill suspects with the race of those who are killed across the United States. We have data on a total of 2,706 fatal police killings for the years 2013 to 2015. This is 1,333 more killings by police than is provided by the FBI data on justifiable police homicides. We conducted three tests of discrimination. The results of these tests are different. In the first test we find some evidence that white officers are more likely to kill a black suspect who is later found to be unarmed than they are to kill an unarmed white suspect. However, this result could not be confirmed using a fixed effects model on panel data aggregated to the city level. In the second test, we find that white police officers are no more likely to kill an unarmed black suspect than are black or Hispanic officers. The results of this test are confirmed by the panel data version of the test. The third discrimination test indicated that black suspects, whether armed or not, are no more likely to be killed by a white officer than they are to be killed by black or Hispanic officers. Similarly, Hispanic suspects are no more likely to be killed by white offices than officers of other races. These results are also confirmed by panel data analyses. We find that when there is more than one officer on the scene, unarmed black suspects are not more likely to be killed by white police officers than unarmed white suspects. This could be evidence supporting a policy of reducing the number of officers working alone. Also, we find no evidence that body cameras affect either the number of police killings or the racial composition of those killings.

Keywords

Police discrimination, Police shootings, Logit regression

1. Introduction

The Black Lives Matter movement was born out of the shooting of 18-year-old Michael Brown. Darren Wilson, a 28-year-old white police officer, shot and killed Brown in Ferguson, Missouri in August 2014. Although Wilson was eventually exonerated by both a grand jury and the Department of Justice, there has been a growing public perception that police in general are biased against black suspects in their use of lethal force. This perception has been reinforced by several subsequent, highly publicized police homicides of black suspects (Note 2). It led some politicians to call for Federal regulations on the use of force by police officers and calls to defund the police (Note 3).

It is important in discussions of public policy to examine the data dispassionately. Data on police killings of suspects is available from the CDC and FBI (see Figure 1). But they miss many such killings. Not all jurisdictions provide data, and very important data is often left out such as the race of the officer and the race of the person who was shot. There is also a lack of information on the incident (e.g., whether the suspect was armed). The CDC collects data on deaths by "legal intervention", defined as any death—including that of a bystander—sustained as a result of an encounter with a law enforcement official (Note 4). This definition includes both killings by and of police officers. To obtain homicides committed by police, one must subtract the number of felonious deaths of police (as provided by the FBI). The FBI provides data on justifiable homicides by law enforcement over the years from 1976 to 2015 (Note 5). The FBI provides 24% more cases than the CDC for the years that data is available from both sources, though most of that difference is for the years from 1981 to 1997. That these data are incomplete is well-known (Note 6).

In response to these shortcomings of the publicly available datasets, we collected our own dataset on police killings for 2013 through 2015. We used Lexis/Nexis, Google, Google Alerts, and several online databases (we provide a more detailed discussion below). For the years in which our data overlaps with those from the FBI and CDC, we find that the FBI missed 1,333 cases (over three years) and the CDC missed 741 cases (over two years).

The Washington Post has also collected cases for 2015, one of the three years that we put together, but they found 18 fewer cases than we had (Note 7). We also collected information not available from the Washington Post dataset on the number of officers on the scene; the officer's name, age, gender, and race; whether the person shot was involved in a violent crime, property crime, or drug related crime. However, the Washington Post has data on mental illness that we don't.

In this paper, we use a new database containing detailed data on the incident itself, the officers and departments involved, and the demographics of the places where the incidents occurred. With these data, we attempt to test the hypothesis that racial animosity causes white police officers to kill black suspects more often than white suspects. Using this new data set we test a number of hypotheses concerning the possible racial bias of police officers.

2. Previous Research

Fryer (2019) uses a detailed database constructed from police data on interactions with civilians in New York City, Houston, Austin, Dallas, Los Angeles County, and six large Florida counties. He tests several hypotheses concerning possible racial bias in the use of both lethal and non-lethal force. He finds that black suspects are more likely to be victims of non-lethal force but are no more likely to be victims of lethal force. Fryer also tests for racial bias in officer-involved killings, although he uses only information on the majority race of the officer unit, not necessarily the race of the officer who actually did the shooting. He finds that the probability of an unarmed black suspect being killed in an officer-involved shooting by a white police officer is four percent higher than for an unarmed white suspect. However, the difference is insignificant, indicating the absence of taste-based racial discrimination by white police officers.

The Fryer study has been criticized in part because the most controversial finding—that black suspects are no more likely to be shot than white suspects—is based entirely on the Houston data and may not be generalizable. Our data are more general and cover over 1,500 towns and cities in every U.S. state. Fryer has also been criticized for relying on arrest reports to determine whether the incident was one in which the officer had to decide whether to use lethal force. If there is bias in the officer's attitude toward black suspects, then that bias is likely to extend to the decision of whether to arrest or not. If so, then Fryer's study suffers from selection bias (Note 8).

Knowles, Persico, and Todd (2001) develop a test for racial discrimination based on the probability that black motorists stopped by police officers are found in possession of contraband at rates different from motorists of other races. They find that,

> In our data, vehicles of African American motorists are searched much more frequently than those of white motorists. However, the probability that a searched driver is found carrying any amount of contraband is similar across races. Thus, we cannot reject the hypothesis that the disparity in the probability of being searched is due purely to statistical discrimination and not to racial prejudice. (p. 206)

A problem with this study is that the authors do not have data on the race of the police officers, forcing them to assume that officers of all races behave similarly.

Anwar and Fang (AF, 2006), using data on traffic stops by state troopers on Florida highways, including the race of the officer, find that, once a vehicle has been stopped, the search rates for white troopers are greater than that for Hispanic officers, which in turn exceeds the search rate for black officers. They find that this ranking is the same for white, black, and Hispanic motorists. Correspondingly, they find that the success rate for white officers is less than that of Hispanic officers, which in turn is less than the success rate for black officers, independent of the race of the motorist. The independence of these rankings across the officer's races indicates no significant racial prejudice.

Antonovics and Knight (AK, 2009) using data from the Boston police department, including the race of the officer, test whether officers of different races search motorists of given race differently. If racial differences are due to statistical discrimination, the rate of search of black motorists, for example, should be the same for all officers, independent of race. In contrast, they find that officers are significantly more likely to conduct a search if the motorist is of a different race, indicating taste-based discrimination on the part of police officers.

In a study for the Center for Policing Equity, P.A. Goff and several co-authors used incident-level data for 12 police departments. They found that black suspects arrested by police are more likely to be subject to force than white suspects, except when it comes to lethal force, confirming Fryer's result (Note 9). When arrests for violent crime are controlled for, the study finds that white suspects are subject to more severe force than black suspects (Goff et al., 2016. Table 5, p. 18).

A widely reported but unpublished study of the 93 unarmed victims listed in the Washington Post database of police homicides found that black people are significantly more highly represented than are whites or Hispanics (Note 10). MacDonald (2016, pp. 31-35, 73-80) argues that police, the majority of whom are white, are disproportionately assigned to high-crime areas, which tend to be largely black. The result is more encounters including lethal encounters in which white police officers shoot black suspects. Campbell, Nix and Maguire (2018) find no significant change in the number of fatal shootings by police officers since the highly publicized shooting of Michael Brown by Officer Darren Wilson in Ferguson, Missouri in 2014.

In a study published in *Injury Prevention*, T.R. Miller (2016) and several co-authors compared hospital records on incidents involving police assault and compared them to those for cases of assault in general. Injuries resulting from general assaults tended to be more severe than those inflicted by law enforcement, and victims of police assault were less likely to be admitted to the hospital. However, forty percent of gunshot wounds inflicted by law enforcement were fatal, compared to 26 percent of gunshot wounds in general.

Nix et al. (2017), using the Washington Post data set for 2015, find that police officers are marginally ($p<.10$) more likely to kill unarmed black suspects than unarmed white suspects. However, the authors do not have the race of the officer. They also find that black suspects are no more likely to be attacking the police officer than white suspects. Although the presence of body cameras is shown in the data base, Nix et al did not use it as a control variable. The data set includes a variable indicating that the suspect exhibited signs of mental illness. Nix et al. included that variable in their regressions, but it was never significant. Using county-level data, Ross (2015) found that both armed and unarmed black suspects face a significantly higher chance of being shot by police than do corresponding white suspects.

Worrell et al. (2018) use very detailed data from a large municipal police department in the Southwest to study the decision to shoot. They find that black suspects are significantly less likely to be shot than other suspects; the more officers on the scene, the more likely the officers are to fire their weapons;

displaying a weapon increases the odds of being shot significantly; and aggression on the part of the suspect increases the odds of being shot by several orders of magnitude. However, to be in the data set, the officer has to have drawn his or her weapon. As in all studies to date, Worrell et al ~~does~~ do not control for the situation precipitating the incident.

Fryer (2018) criticizes all existing research, including his own, for poor research design, especially for failing to control for possible selection bias. "To draw firm conclusions about the 'race effect' one needs to assume that …, race is 'as good as randomly distributed' and that there are no other differences in suspect behavior or any other potential contextual factor that is important" (p. 3). Also, "…if one assumes the police are non-strategic in their stopping behavior, then there is clear bias. Conversely, if one assumes the police are stopping individuals they are worried will engage in violent crimes, the evidence for bias is small" (p. 4). This is a problem with no obvious solution. No one has data on the situation before the interaction between the suspect and the police officer.

Our study has incident-level data on 2,706 line-of-duty police homicides from a large number of departments. Unlike Worrell et al. (2018) we do not have data on the decision to shoot. However, we have very detailed data on police homicides from more police departments than any previous study. We also have the race of the officer which is missing in many studies. We employ three tests for discrimination at the incident level. We repeat these tests using fixed effects panel estimates on the same data aggregated to the city level to correct for possible unobserved heterogeneity.

3. Data

We have 2,706 observations of police killings from over 1,500 cities in the United States from 2013 to 2015. The data were collected from several sources: LexisNexis, Google, Google Alerts, and several online databases concerned with police killings. We also consulted online police data from Philadelphia and Dallas. As there is a lack of publicly disclosed information concerning officers, we tried to contact each police department to get more information on the officers involved in the killings. See the online appendix for more information, including details as to how the searches were conducted and the URL addresses for the online databases. The online appendix also has a list of the contact information for the police departments that were willing to provide more details about their officers. Compared to the Washington Post data set our data set has detailed information on the police officer(s) involved and more information on the incident.

Although we have observations over three years, at the incident level this is not a panel data set. Only a relatively small number of large cities are in the data set for all three years. Most cities have only one incident and some cities have multiple incidents in a single year. At this level of detail, we cannot employ city fixed effects. However, we do include state dummies in an attempt to control for jurisdictional effects and year dummies to control for events that could affect all cities in a given year, such as the "Ferguson effect" (Note 11). Also, the incident data can be aggregated into a city-level panel data set, with city and year fixed effects, as we do in section 6 below.

With respect to the incident, we have the race of the suspects killed (Black, White, Hispanic, other) and their age. With respect to the officer(s) involved, we have race and gender for 918 incidents. We also have data for the number of officers on the scene. We suspect that the more officers on the scene, the less likely it is that the suspect will resist. We also suspect that the police report is more likely to be accurate. Also, officers who are alone might resort to lethal force more readily than those who have backup, as a matter of their own safety. With respect to the suspect, we have data on whether the suspect was involved in a violent crime, a property crime, or a drug-related crime. We also have data on whether the suspect was armed and, if so, the type of weapon (firearm, knife, vehicle, other).

With respect to the police departments, we used the 2013 Law Enforcement Management and Administrative Statistics survey (LEMAS) data on their racial makeup, use of body cameras or cameras on weapons, if the same officers are assigned to given neighborhoods, and whether community policing is part of the department's mission statement. We also know whether the department uses helicopters (a proxy for militarization), the number of marked and unmarked police cars per 100,000 population, the proportion of part-time officers, whether some college education is required for new hires, and whether the police are unionized (which gives police officers an additional layer of legal protection and job security in the event of a shooting).

At the city level we control for total population, violent crime levels (broken down by murder, rape, robbery, and assault), and the number of black, white, and Hispanic males in the age group 15-29.

The number of observations and means are shown in Tables 1 and 2. Table 1 shows that 25 percent of the suspects killed were black, 45 percent white, and 16 percent Hispanic. The remaining 14 percent were Asian, American Indian, or other. With respect to the officer's race, 29% were white, 1.7% black (45 cases), 2.5% Hispanic (67 cases), and for 66% (1788 cases) their race is unknown. Four percent of the officers were female (67 cases). There was an average of 2.4 officers on the scene—an average that was approximately constant for suspects of the various races.

Table 1. Variables, Number of Observations and Means

	Overall		White		Black		Hispanic	
Variable	N	Mean	N	Mean	N	Mean	N	Mean
Suspect white	2706	45.34	1227	100	673	0	442	0
Suspect black	2706	24.87	1227	0	673	100	442	0
Suspect Hispanic	2706	16.33	1227	0	673	0	442	100
Officer white	2706	29.12	1227	35.29	673	28.38	442	19.68
Officer black	2706	1.66	1227	1.06	673	4.01	442	0.68
Officer Hispanic	2706	2.48	1227	2.20	673	1.93	442	4.30
Officer other race	2706	0.67	1227	0.65	673	0.45	442	0.90
Officer race unknown	2706	66.08	1227	60.80.	673	65.23	442	74.43

Officer female	1721	3.89	847	3.19	431	3.71	257	4.28
Total population/1000	2687	41.67	1215	25.07	668	60.96	442	56.45
Number police on scene	2706	2.39	1227	2.49	673	2.18	442	2.40
Bodycams used	2706	18.44	1227	16.14	673	17.98	442	26.24
Cameras on weapons	2706	6.43	1227	6.03	673	6.69	442	5.20
Same officers in neighborhood	2706	55.99	1227	48.25	673	65.53	442	64.25
Marked cars per 100k pop	1649	53.65	687	72.00	455	65.91	292	7.23
Unmarked cars per 100k pop	1649	33.01	687	50.12	455	30.81	292	3.74
Helicopters used	2706	35.66	1227	27.30	673	44.87	442	44.12
Percent part-time officers	1818	1.310	740	1.88	504	0.99	336	0.58
Percent police dept white	1811	68.59	735	76.60	503	65.23	335	58.51
Percent police dept black	1811	10.54	735	7.01	503	17.42	335	7.89
Percent police dept Hispanic	1811	14.44	735	9.90	503	12.72	335	27.35
Percent police dept female	1808	12.41	733	10.75	502	14.74	335	12.47
Police unionized	2706	59.350	1227	50.37	673	67.90	442	70.59
Some college required	2706	7.80	1227	5.54	673	12.78	442	5.66
Community policing mission	2706	55.51	1227	46.70	673	65.97	442	66.06

Eighteen percent of the police departments reported the use of body cameras on patrol officers, while 6% used cameras on weapons. Fifty-six percent reported that they assign the same officers to given neighborhoods and 56% report that community policing is in the mission statement. Both percentages are somewhat higher for cases in which black suspects are killed. Helicopters are used in 35% of all departments—somewhat higher in cities where black suspects were killed. Part-time sworn officers are rare, and only a few departments require some college education for a new hire. Most departments are unionized. Sixty-nine percent of the police officers were white, 11 percent black, and 14 percent Hispanic, although the departments involved in the killing of black suspects tended to have more black officers and those involved with Hispanic suspects had relatively more Hispanic officers.

Perusal of Table 2 reveals that police killings overwhelmingly involve armed suspects. Almost nine out of 10 suspects (89%) killed by police were armed and the differences across race are small: 90% white suspects were armed compared to 85% of black suspects and 87% of Hispanic suspects. Most of the suspects, 60 percent, were armed with a firearm, 18% with a knife or cutting instrument, and 4% of the suspects used a vehicle as a weapon. Thirty-nine percent of the suspects were involved in a violent crime, 17% in a property crime, and 5% in a drug crime. Black suspects were more likely to be involved in a property crime than white or Hispanic suspects.

Table 2. Variables, Number of Observations and Means, Continued

	Overall		White		Black		Hispanic	
Variable	N	Mean	N	Mean	N	Mean	N	Mean
Suspect armed	2644	89.07	1203	90.36	661	85.48	433	86.61
Suspect armed with firearm	2706	59.83	1227	62.67	673	60.48	442	51.36
Suspect armed with knife	2706	17.55	1227	16.63	673	14.26	442	20.14
Suspect vehicle as weapon	2706	4.43	1227	3.99	673	5.65	442	5.43
Suspect used other weapon	2706	6.39	1227	6.44	673	4.90	442	8.14
Suspect's age	2677	36.47	1225	39.29	671	32.00	438	32.59
Involved in violent crime	2706	39.17	1227	39.2	673	38.93	442	36.65
Involved in property crime	2706	16.63	1227	15.08	673	21.69	442	16.74
Drug related	2706	5.32	1227	4.32	673	7.13	442	6.11
Suicidal	2706	9.39	1227	11.98	673	2.53	442	10.18
More than one suspect	2706	0.81	1227	0.49	673	1.49	442	0.90
Percent black males 15-29	2242	2.00	953	1.45	589	3.51	389	1.20
Percent white males 15-29	2242	5.37	953	6.41	589	4.88	389	3.84
Percent Hispanic males 15-29	2242	3.19	953	2.34	589	2.73	389	5.87
Violent crime rate per 100K	2198	593.92	947	490.16	572	791.38	389	580.67
Murder rate per 100K	2198	7.84	947	5.44	572	12.21	389	7.25
Rape rate per 100K	2190	37.30	946	36.89	566	45.18	389	32.57
Aggravated assault rate per 100K	2198	357.87	947	312.53	572	452.87	389	346.59
Robbery rate per 100K	2198	183.67	947	125.85	572	277.88	389	185.12

Cities experiencing police homicides have higher than average violent crime rates (594 violent crimes per 100,000 compared to 368 for the U.S. as a whole.) and violent crime rates are higher in cities where black suspects were killed (791) compared to cities in which white suspects were killed (490). The same is true for the subcategories of violent crime. The murder rate is particularly high in cities where black suspects were killed by police (12.2) compared to cities in which white suspects were killed (5.4). Young black men represent a greater proportion of the population in cities that experience police killings of black suspects (3.5%) compared to cities where white suspects were killed (1.4%).

Our numbers (Figure 1) show a 29% increase in killings by police officers from 2013 to 2015. This is in sharp contrast to the FBI data, which show a small, 6% drop in police killings. The FBI report many fewer cases than have occurred and they also miss many significant details about the cases that they do report. In only about 31% to 35% of the cases does the FBI have data on the age, race, and gender of the deceased. By contrast, we have this information for 100% of our cases.

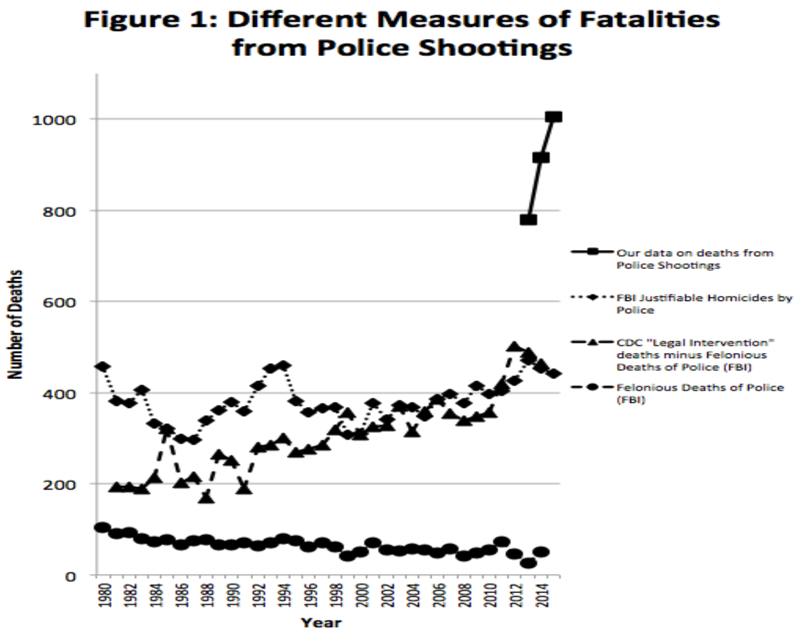

Figure 1. Different Measures of Fatalities from Police Shootings

Figure 2 presents our breakdown by race. It appears that the sharpest upward trend in killings was among white suspects. The percentage of suspects killed who were white and Hispanic rose, while the percentage of those who were black remained virtually unchanged. At least over recent history, the evidence does not support the hypothesis that police are targeting black suspects more now than they did in the past. However, the fact that black suspects have historically been overrepresented in police homicides could be indicative of continuing racial bias.

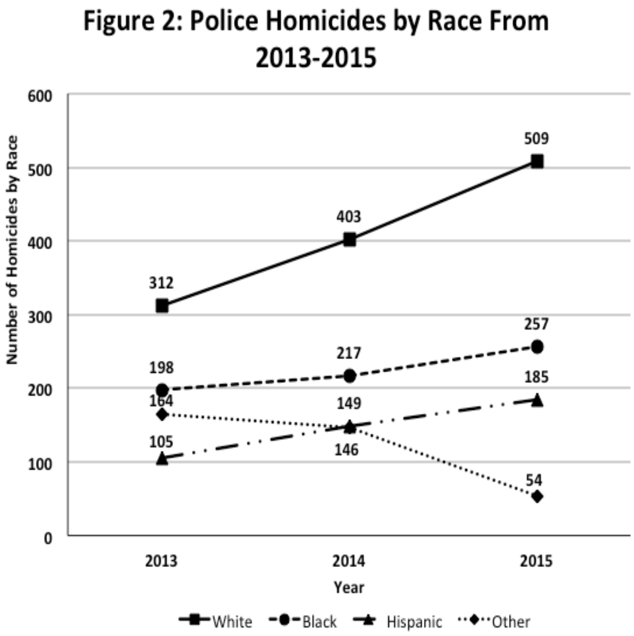

Figure 2. Police Homicides by Race from 2013-2015

After the August 2014 shooting of Michael Brown in Ferguson, one might expect that the ensuing publicity would have caused a drop in the rate at which black suspects were shot. Yet black suspects' share of police killings remained virtually identical (24.8% before Ferguson and 25% afterwards).

Of course, there are other potential deterrents to police engaging in racial bias such as the use of police body cameras. When a shooting is recorded by a body cam, officers know that it will become a central focus of the public debate. After the recent shooting of Keith Lamont Scott in Charlotte, massive pressure was put on the police department to release the video (even though the police chief had cautioned that there was little to learn from the video) (Note 12). If an officer unjustifiably shoots a suspect because of his race, cameras or the presence of other police will make it harder to hide the truth. Attorney General Loretta Lynch claimed: "Body-worn cameras hold tremendous promise for enhancing transparency, promoting accountability, and advancing public safety". In May 2015, she provided $20 million to study these possible benefits (Note 13).

The FBI and CDC data also don't contain any information on the race or gender of the police officers involved in the shooting. In 33% of our cases, we have information on the races of the officers. This information is important if we are going to be able to try to determine any racial bias in killings. If white and black officers respond similarly, it is less likely that they are shooting the suspect because of a personal taste for racism.

4. Test for Racial Discrimination by White Police Officers

If white officers are racist, they presumably will be more likely to kill black suspects who are later found to be unarmed than they are to kill white suspects who turn out to be unarmed. The null hypothesis is that the probability of being armed, given that the suspect is black and has been killed by a white police officer equals the probability of a white suspect being armed given that the white suspect was killed by a white officer:

$$P(A|B,K,Ow)=P(A|W,K,Ow) \quad (1)$$

where A indicates the suspect was armed, B indicates the suspect was black, W indicates the suspect was white, K indicates that the suspect was killed, and Ow indicates that the officer was white. The alternative hypothesis is that the probabilities are not equal and if $P(A|B,K,Ow) < P(A|W,K,Ow)$, then white officers tend to shoot first and check for a weapon later if the suspect is black, evidence of taste-based discrimination by white police officers against black suspects.

The difference between the probabilities with respect to the race of the suspect may also be due to other factors. For example, the result of the officers' experience with black suspects could affect lethality. Also, an officer might shoot and kill an unarmed suspect if the suspect is committing a violent crime, not obeying the officer's commands, or attempting to get possession of the officer's firearm. The suspect's age might also be related to whether the police could view the suspect as a threat or whether the suspect will follow the police officer's instructions. Also, the number of police officers involved could be important. Suspects might not resist if faced with more than one officer. An officer acting alone might resort to lethal force with a higher probability if he or she has no backup. A racist police officer might also be deterred from expressing that racism in the presence of other officers.

We also control for violent crime on the theory that the more violent crime, the more likely it is that officers will have experience with dangerous suspects who are likely to resist, fail to obey orders, or threaten other civilians. The proportion of young black males is a potential control for two reasons: the level of violent crime for young black males may not be well controlled by the overall violent crime rate and the experience officers have had with black suspects. Finally, we account for the racial composition of officers in the various police departments. It is possible that racial bias by individual police officers could be affected by the racial composition of the department. A white officer in a heavily black department may find it more difficult to be racist.

The results of this test are reported in Table 3. Since the dependent variable is a dummy variable taking the unit value if the suspect is armed, we use a logit regression. The test statistics are the chi-square tests on the difference between the coefficients on the black and white suspects reported in the bottom two rows. The standard errors are robust with respect to heteroscedasticity. In the first model (Model 1) we estimate a simple model with no control variables. The coefficient for black suspects is significantly less than the coefficient for white suspects, indicating that fewer black suspects were found to be armed after being killed by white police officers. Including suspect and incident characteristics (Model 2), especially the dummy for two or more police officers and the dummy for whether the suspect is involved in a violent crime, renders the test insignificant at the .05 level for a two-tailed t-test. Including the violent crime rate, the proportion of the population between15-29, and several variables related to the police department (Model 3) also renders the coefficient on the dummy variable for black suspects insignificant. However, when we add state and year fixed effects (Model 4), the coefficient on the black dummy variable is again significantly negative. Since the coefficient on the dummy indicating that the suspect is black is significantly different from the coefficient on the dummy indicating the suspect is white in two out of four models, we find mixed evidence with respect to the existence of taste-based discrimination by white police officers.

Table 3. Do White Police Officers Kill Unarmed Black Suspects More Often than Unarmed White Suspects?

Variable	Model 1	Model 2	Model 3	Model 4
Suspect black	0.330	0.335	0.550	0.669
	(0.153)*	(0.173)*	(0.379)	(0.590)
Suspect white	0.629	0.535	2.195	3.429
	(0.284)	(0.269)	(1.569)	(3.441)
Suspect Hispanic	0.670	0.618	1.354	2.922
	(0.363)	(0.373)	(1.080)	(3.275)
Officer female		0.459	0.896	0.460
		(0.220)	(0.578)	(0.378)
More than one officer		3.564	2.878	3.151
		(0.805)**	(0.984)**	(1.332)**
More than one suspect		0.469	1.540	0.647
		(0.377)	(1.339)	(0.786)
Involved in violent crime		2.874	4.958	6.385
		(0.802)**	(2.320)**	(4.405)**
Involved in property crime		0.872	0.803	1.167
		(0.254)	(0.335)	(0.585)
Drug related		0.492	0.316	0.239
		(0.209)	(0.174)*	(0.149)*
Suspect's age		1.017	1.034	1.023
		(0.009)*	(0.019)	(0.020)
Population			0.999	0.998
			(0.002)	(0.003)
Violent crime rate			0.919	0.846
			(0.046)	(0.059)*

Percent black males 15-29			1.377	1.554
			(0.184)*	(0.307)*
Percent police dept female			1.061	1.102
			(0.043)	(0.071)
Percent police dept black			0.943	0.887
			(0.023)*	(0.051)*
Percent police dept white			0.981	0.931
			(0.016)	(0.047)
Percent police dept Hispanic			0.983	0.917
			(0.022)	(0.050)
Bodycams used			0.638	0.594
			(0.247)	(0.334)
Police unionized			2.686	4.217
			(1.346)*	(2.597)*
N	777	767	402	324
State & year fixed effects?	No	No	No	Yes
Suspect black = suspect white	7.65**	3.41	10.24**	8.70**
P-value	0.006	0.065	0.001	0.003

Notes. Logit regression; white police officers only; the dependent variable is a dummy variable which equals 1 if the subject was armed; coefficients are odds ratios; robust standard errors in parentheses; * p<0.05, ** p<0.01. The omitted class consists of suspects of race other than black, white, or Hispanic. The last two lines report the Chi-square test of equality between the coefficients on white and black suspects.

If the officer is not alone, there is a smaller probability a black suspect killed by a police officer will be found to be unarmed. If the proportion of the population consisting of young black males is large or the police are unionized, the less likely police officers are to kill an unarmed black suspect. Suspects killed while involved in a violent crime are more likely to be armed. Also, there is some evidence that police officers are more likely to kill an unarmed black suspect in the commission of a drug-related crime. Somewhat surprisingly, white police officers from police departments with larger proportions of black officers are significantly more likely to kill unarmed black suspects than those from departments with fewer black officers.

Although not reported to conserve space, we found using chi-square tests that, in those cases where the officer had backup, the suspect was involved in a violent crime, or the police department is unionized, unarmed black suspects are not killed significantly more often than unarmed white suspects. An F-test revealed that the state and year dummy variables were not significant as a group, indicating that Model 3 is our preferred specification.

As robustness checks, we repeated the analysis for black officers, Hispanic officers, and all officers. For all officers, we found results similar to those for white officers, which is to be expected since the majority of police officers are white. We found that black and Hispanic officers killed unarmed black suspects at probabilities not significantly different from unarmed white suspects. All results, programs and data are available in the online appendix.

5. Tests for Relative Racial Discrimination

In our second test the null hypothesis is that the probability of an armed black suspect being killed by a white officer (Ow) is equal to the probability of the same suspect being killed by a black officer (Ob).

$$P(A|B,K,Ow)=P(A|B,K,Ob) \quad (2)$$

We regress the dummy variable for armed black suspects on a set of dummy variables indicating the race of the officer: white, black, or Hispanic. The test is a chi-square test for the equality of the coefficients on white and black officers. If there is taste-based discrimination on the part of white officers, relative to black officers, we should find that the probability that an unarmed black suspect would be killed by a white officer is significantly higher than the same probability if the officer is black. The results are presented in Table 4. The standard errors are robust with respect to heteroscedasticity. The test statistics are the chi-square statistics reported in the bottom two rows.

Table 4. Do White Officers Kill Unarmed Black Suspects More Often than Black Officers?

	Model 1	Model 2	Model 3	Model 4
Officer black	8.800	11.565	1.833	1.220
	(11.635)	(13.495)*	(2.467)	(2.299)
Officer white	7.590	12.239	2.306	1.270
	(9.402)	(12.799)*	(2.720)	(2.184)
Officer Hispanic	24.000	42.086	7.668	4.842
	(38.604)*	(60.844)**	(10.798)	(9.228)
Officer race unknown	15.592	20.931	8.340	5.729
	(19.257)*	(22.205)**	(10.318)	(10.047)
Officer female		1.102	0.700	0.141
		(0.945)	(0.658)	(0.165)
More than one officer		2.189	1.845	3.237
		(0.601)**	(0.686)	(1.593)*
More than one suspect		0.586	0.843	0.923
		(0.489)	(0.860)	(1.250)
Involved in violent crime		2.002	1.790	1.813
		(0.618)*	(0.789)	(0.925)
Involved in property crime		0.959	0.911	0.887

		(0.310)	(0.389)	(0.465)
Drug related		0.318	0.198	0.166
		(0.137)**	(0.114)**	(0.128)*
Suspect's age		1.010	1.030	1.029
		(0.012)	(0.018)	(0.019)
Population			0.999	0.995
			(0.001)	(0.003)
Violent crime rate			1.000	1.001
			(0.000)	(0.001)
Percent black males 15-29			0.965	1.071
			(0.090)	(0.140)
Percent police dept female			1.021	0.994
			(0.031)	(0.063)
Percent police dept black			0.993	0.919
			(0.035)	(0.066)
Percent police dept white			1.012	0.968
			(0.031)	(0.061)
Percent police dept Hispanic			0.961	0.927
			(0.036)	(0.058)
Bodycams used			0.951	1.060
			(0.396)	(0.589)
Police unionized			2.251	6.903
			(1.482)	(6.353)*
N	661	424	266	215
State & year fixed effects?	No	No	No	Yes
Officer white=officer black	0.08	0.01	0.11	0.00
P-value	0.779	0.921	0.742	0.961

Notes. Logit regression; black suspects only; coefficients are odds ratios; robust standard errors in parentheses; * $p<0.05$, ** $p<0.01$. The dependent variable is the dummy indicating the suspect was armed. The last two lines report the Chi-square test of equality between the coefficients on white and black officers.

We find no significant difference between the coefficients for white and black officers. These results are confirmed when we add state and year effects to the first three models. We also find no significant difference between the white and Hispanic and black and Hispanic officers. We have suppressed these latter results to conserve space. All results are available in the online appendix.

An alternative is to test the null hypothesis that the odds of a black suspect, whether armed or not, being killed by a white police officer are the same as the odds of a black suspect being killed by a black officer. If white police officers kill black suspects primarily because of racial animus, we would expect that black police officers would kill black suspects at a lower rate than white officers do.

The null hypothesis is

$$\frac{P(K \mid B, O_W)}{P(K \mid O_W)} = \frac{P(K \mid B, O_B)}{P(K \mid O_B)} \tag{3}$$

where K indicates the suspect was killed, B that the suspect was black, Ow that the officer was white, and Ob that the officer was black. Because we do not have data on incidents in which the suspect was not killed, we only know the probability that a suspect was black, given that the suspect was killed and the race of the officer. That is, we know

$$P(B \mid \mathrm{O}_W, K) \tag{4}$$

and

$$P(B \mid \mathrm{O}_B, K). \tag{5}$$

Applying Bayes' rule, we have

$$\begin{aligned} P(K \mid B, O_W) &= \frac{P(B, O_W \mid K)\,\mathrm{P(K)}}{P(B, O_W)} \\ &= \frac{P(B \mid O_W, K)\,\mathrm{P}(O_W \mid K)\,\mathrm{P(K)}}{P(\mathrm{B} \mid \mathrm{O}_W)\,\mathrm{P}(\mathrm{O}_W)} \end{aligned} \tag{6}$$

For the denominator of the left-hand side of (3),

$$P(K \mid O_W) = \frac{P(K, O_W)}{P(O_W)} = \frac{P(O_W \mid K)P(K)}{P(O_W)} \tag{7}$$

Dividing (6) by (7) yields the left-hand side of (3):

$$\begin{aligned} \frac{P(K \mid B, O_W)}{P(K \mid O_W)} &= \frac{P(B \mid O_W, K)P(O_W \mid K)P(K)}{P(B \mid O_W)P(O_W)} \times \frac{P(O_W)}{P(O_W \mid \mathrm{K})\,\mathrm{P(K)}} \\ &= \frac{P(B \mid O_W, K)}{P(B \mid O_W)} \end{aligned} \tag{8}$$

A similar development for black officers yields,

$$\frac{P(K \mid B, O_B)}{P(K \mid O_B)} = \frac{P(B \mid O_B, K)}{P(B \mid O_B)} \tag{9}$$

We can now restate the null hypothesis (3) as,

$$\frac{P(B|O_w,K)}{P(B|O_w)}=\frac{P(B|O_B,K)}{P(B|O_B)} \tag{10}$$

Since we only have data on (4) and (5) we assume that

$$P(\mathrm{B}|O_W)=P(\mathrm{B}|O_B) \tag{11}$$

That is, we assume that black suspects will encounter black and white police officers with the same probability. As discussed above, no study to date has direct observations on these probabilities. However, we have the racial composition of the police departments and we have demographic data for the cities in which the incidents occurred. We include those variables to control for these probabilities.

We test this null hypothesis using a logit regression on the binary variable indicating that the suspect was black. The variables of interest are again dummy variables indicating the race of the officer. The test is a chi-square test for the equality of the coefficients on white and black officers. If the test indicates that white officers are significantly more likely to kill a black suspect than black officers are, we have evidence of racial discrimination on the part of white police officers.

The results are reported in Table 5. The standard errors are robust with respect to heteroscedasticity. There are four models. Model 1 includes the police officer's race and the demographic variables that control for the interaction between black suspects and black and white officers (population, percent black males 15-29, proportion of the police department that are black, white and Hispanic). Model 2 adds incident level controls (officer female, more than one officer present, suspect involved in violent crime, suspect involved in property crime, crime is drug related, and the suspect's age) and the percentage of the police department that is female. Model 3 adds controls for the use of bodycams and whether the police department is unionized. Model 4 adds state and year dummies. Again, the test statistic is reported in the bottom two rows.

Table 5. Do White Officers Kill Black Suspects More Often than Black Officers?

Variable	Model 1	Model 2	Model 3	Model 4
Officer white	1.271	1.257	1.317	1.165
	(0.818)	(0.972)	(1.051)	(0.995)
Officer black	2.060	2.381	2.575	2.067
	(1.598)	(2.224)	(2.425)	(2.002)
Officer Hispanic	0.673	0.511	0.522	0.582
	(0.520)	(0.481)	(0.502)	(0.575)
Officer race unknown	0.972	1.152	1.187	0.940
	(0.622)	(0.892)	(0.950)	(0.804)
Population	1.002	1.002	1.002	1.003
	(0.001)**	(0.001)*	(0.001)*	(0.001)
Pct black males	1.386	1.431	1.450	1.303

15-29				
	(0.096)**	(0.113)**	(0.116)**	(0.130)**
Pct police dept black	1.037	1.029	1.031	1.019
	(0.011)**	(0.020)	(0.020)	(0.022)
Pct police dept white	1.002	1.010	1.011	1.001
	(0.005)	(0.015)	(0.015)	(0.010)
Pct police dept Hispanic	1.001	1.006	1.008	1.007
	(0.006)	(0.016)	(0.016)	(0.012)
Officer female		0.896	0.935	0.951
		(0.387)	(0.396)	(0.455)
More than one officer		0.543	0.540	0.570
		(0.107)**	(0.106)**	(0.121)**
More than one suspect		2.314	2.227	1.834
		(1.379)	(1.338)	(1.339)
Involved in violent crime		0.973	0.955	0.980
		(0.180)	(0.179)	(0.196)
Involved in property crime		1.324	1.319	1.401
		(0.302)	(0.300)	(0.343)
Drug related		1.436	1.363	1.527
		(0.518)	(0.500)	(0.597)
Suspect's age		0.965	0.965	0.965
		(0.008)**	(0.008)**	(0.008)**
Violent crime rate		1.001	1.001	1.001
		(0.000)**	(0.000)*	(0.000)**
Pct police dept female		1.056	1.053	1.058
		(0.022)**	(0.022)*	(0.029)*
Bodycams used			0.872	0.932
			(0.172)	(0.231)
Police unionized			1.843	2.160
			(0.646)	(0.864)
N	1,564	900	900	861
State & year fixed effects?	No	No	No	Yes
Officer black=officer white	1.11	1.34	1.59	1.27
P-value	0.292	0.247	0.207	0.261

Notes. Logit regression; coefficients are odds ratios; robust standard errors in parentheses* $p<0.05$, ** $p<0.01$. The dependent variable is a dummy variable indicating that the suspect was black. Model 4 includes state and year dummies. The last two lines report the Chi-square test of equality between the coefficients on black and white officers.

In all four models, white officers are not significantly more likely than black officers to kill a black suspect (Note 14). We find that the presence of another officer on the scene significantly reduces the odds of a black suspect being killed by officers of any race. Also, older suspects are significantly less likely to be killed. Increases in the overall violent crime rate causes more black suspects to die at the hands of the police. Increases in the percentage of young black males in the population increases the chances of black suspects being killed by the police. Female police officers are no more or less likely to kill a black suspect than male officers. However, officers in departments with higher proportions of female officers are significantly more likely to kill black suspects.

Although not reported to conserve space, we repeated these regressions on white and Hispanic suspects. We also added state and year fixed effects to the first three models. The results were the same.

For all three tests, the use of bodycams by the police department has no significant effect. Except for one case, the remaining LEMAS variables: cameras on guns, assigning the same officers to neighborhoods, the use of marked or unmarked vehicles, the use of helicopters, the proportion of part-time sworn officers, requiring some college education for new recruits, and implanting community policing policies, are not significant (Note 15).

6. Panel Estimation

Although we have three years of data, at the incident level the data is a cross section. The most serious problem with cross section data is unobserved heterogeneity. Since cities can vary substantially with respect to unobserved and often unobservable characteristics such as history, climate, and culture, and these characteristics are very likely to be correlated with the included variables, any cross-section regression would be biased by these omitted variables, which are only partially controlled for by state and year dummies. Unobserved heterogeneity can be avoided by estimating a fixed-effects model on panel data. We can create a panel data set of cities by aggregating across incidents to the city level (Note 16). This aggregation loses some detail, for example we can no longer assign a given suspect, or officer, to a given incident. Instead, we have the percentage of suspects or officers who are white, black, Hispanic, etc. We also lose the information on the police departments, such as whether officers are required to wear body cameras, the racial composition of the police department, etc. However, the effect of these police department variables on police killings will be captured by the fixed effects for each city. These city fixed effects also control for any cultural differences across departments. For example, it may be surmised that black officers in some cities could kill black suspects at the same rate as white officers because they have adopted a discriminatory culture that is characteristic of that city. The city fixed effects should correct for such cultural differences. We also include year fixed effects to reduce any spatial correlation and control for factors that could affect all cities in a given year. The variables of interest in the panel data set are summarized in Table 6.

Table 6. Variables, Number of Observations and Means, Panel Data

	Overall		2013		2014		2015	
Variable	N	Mean	N	Mean	N	Mean	N	Mean
Pct armed	1857	87.40	520	87.28	619	86.66	718	88.14
Pct black suspects armed	1857	18.23	520	18.44	619	17.28	718	18.89
Pct white suspects armed	1857	45.62	520	39.55	619	43.61	718	51.74
Pct Hispanic suspects armed	1857	11.54	520	10.60	619	11.09	718	12.61
Pct suspect black	1857	21.68	520	21.67	619	21.03	718	22.26
Pct suspect white	1857	51.53	520	45.81	619	49.72	718	57.23
Pct suspect Hispanic	1857	13.62	520	12.29	619	13.02	718	15.10
Pct black officer	1857	1.59	520	1.05	619	2.12	718	1.53
Pct Hispanic officer	1857	1.94	520	1.65	619	2.84	718	1.38
Pct officer race other	1857	0.44	520	0.38	619	0.78	718	0.20
Pct officer race unknown	1857	66.14	520	71.12	619	54.05	718	72.95
Population	1838	14.24	516	16.76	614	13.03	708	13.46
Violent crime rate	1398	500.64	391	484.93	472	497.42	535	514.95
Pct black males 15-29	1415	1.87	469	1.77	584	1.91	362	1.95
Pct involved in violent crime	1857	39.76	520	40.68	619	46.38	718	33.39
Pct involved in property crime	1857	15.52	520	17.51	619	17.22	718	12.61
Pct drug related	1857	5.29	520	3.76	619	4.58	718	7.02
Pct suicidal	1857	10.21	520	5.60	619	10.99	718	12.87
Average suspect age	1849	37.36	516	37.37	615	37.26	718	37.45
Pct more than one officer	1857	83.52	520	87.88	619	79.64	718	83.70

In the first exercise we use a fixed-effects model to re-estimate the test reported in Table 3. The dependent variable is the proportion of suspects in killed each city who were eventually found to be armed. The explanatory variables of interest are the proportions of black, white, and Hispanic suspects killed in each city. As in the previous analyses, we estimate the model using various levels of control variables. However, we always include city and year dummies. The standard errors are robust to heteroscedasticity. The results are reported in Table 7.

Table 7. Do Police Officers Kill Unarmed Black Suspects More Often than Unarmed White Suspects? Fixed-effects City Panel Data Regression

	Model 1	Model 2	Model 3
Percent suspect black	0.052	0.049	0.072
	(0.060)	(0.063)	(0.071)
Percent suspect white	0.025	0.016	0.019
	(0.055)	(0.059)	(0.062)
Percent suspect Hispanic	0.014	0.012	0.004
	(0.076)	(0.079)	(0.083)
Population		1.599	1.326
		(1.202)	(1.145)
Violent crime rate		0.009	0.011
		(0.012)	(0.011)
Percent black males 15-29		17.388	13.716
		(14.912)	(14.059)
Percent involved in violent crime			0.059
			(0.042)
Percent involved in property crime			-0.058
			(0.062)
Percent drug related			-0.063
			(0.094)
Percent suicidal			0.014
			(0.064)
Suspect age			-0.007
			(0.175)
Percent more than one officer			0.110
			(0.052)*
Percent more than one suspect			-0.087
			(0.095)
N	1,857	1,167	1,163
City & year fixed effects?	Yes	Yes	Yes
F test: pct white suspects = pct black suspects	0.34	0.42	0.88
Prob > F	0.562	0.515	0.350

Notes. Robust standard errors in parentheses; * p<0.05; ** p<0.01. The dependent variable is the proportion of suspects who were armed. The last two lines report the F-test on the equality of the coefficients on black and white suspects.

The coefficient on the percent of black suspects is not significantly different from the coefficient on the percent of white suspects, according to a standard F-test which is reported in the last two lines. Although not reported, there was also no significant difference between the coefficients on the remaining pairs of suspect race percentages.

In the next exercise we estimate the panel version of our second test, reported in Table 4, in which we regress the percentage of black suspects found to be armed on the percentages of officers in each city who are black, white, and Hispanic. The results are reported in Table 8. As shown on the bottom two lines, we cannot reject the null hypothesis that black and white officers act similarly with respect to potentially armed black suspects. The results are the same with respect to black and white officers relative to Hispanic officers.

Table 8. Do White Officers Kill Unarmed Black Suspects More Often than Black Officers? Fixed-effects City Panel Data Regression

	Model 1	Model 2	Model 3
Percent white officer	-0.029	-0.016	-0.027
	(0.048)	(0.050)	(0.048)
Percent black officer	0.154	0.233	0.070
	(0.193)	(0.237)	(0.180)
Percent Hispanic officer	-0.027	0.054	0.010
	(0.189)	(0.224)	(0.210)
Population		1.197	1.459
		(1.372)	(1.325)
Violent crime rate		0.012	0.006
		(0.018)	(0.017)
Percent black males 15-29		18.623	25.313
		(16.702)	(16.244)
Percent involved in violent crime			-0.054
			(0.047)
Percent involved in property crime			-0.005
			(0.059)
Percent drug related			-0.055
			(0.130)
Percent suicidal			-0.196
			(0.060)**
Suspect age			-0.723
			(0.165)**
Percent more than one officer			-0.019
			(0.058)
Percent more than one suspect			-0.025
			(0.304)
N	1,857	1,167	1,163
City & year fixed effects?	Yes	Yes	Yes
F test: pct white officer=pct black officer	0.90	1.12	0.30
Prob>F	0.343	0.289	0.587

Notes. Robust standard errors in parentheses; * $p<0.05$; ** $p<0.01$. The dependent variable is the percent of black suspects who were armed. The last two lines report the F-test on the equality of the coefficients on percent black and white officers.

We repeated the analysis on the proportion of armed white suspects and on the percentage of armed Hispanic suspects. With respect to Hispanic suspects, the results are the same as black suspects, namely no significant differences with respect to the races of police officers. However, we did find some evidence that unarmed white suspects are less likely to be killed by white and Hispanic officers (Table 9). Although not reported, there is some evidence that Hispanic officers kill unarmed white suspects at lower rates than black officers.

Table 9. Do White Police Officers Kill Unarmed White Suspects More Often than Black Officers? Fixed-effects City Panel Data Regression

	Model 1	Model 2	Model 3
Percent white officer	0.199	0.202	0.213
	(0.056)**	(0.060)**	(0.060)**
Percent black officer	-0.216	-0.277	-0.185
	(0.200)	(0.246)	(0.227)
Percent Hispanic officer	0.345	0.293	0.349
	(0.123)**	(0.139)*	(0.139)*
Population		0.298	-0.148
		(1.085)	(1.091)
Violent crime rate		-0.019	-0.016
		(0.013)	(0.013)
Percent black males 15-29		8.782	2.944
		(10.952)	(11.540)
Percent involved in violent crime			0.034
			(0.060)
Percent involved in property crime			0.017
			(0.081)
Percent drug related			-0.193
			(0.097)*
Percent suicidal			0.161
			(0.072)*
Suspect age			0.422
			(0.215)
Percent more than one officer			0.091
			(0.060)
Percent more than one suspect			-0.060
			(0.214)
N	1,857	1,167	1,163
City & year fixed effects?	Yes	Yes	Yes
F test: pct white officer=pct black officer	4.24	3.80	3.13
Prob>F	0.040*	0.052	0.077

Notes. Robust standard errors in parentheses; * $p<0.05$; ** $p<0.01$. The dependent variable is the percentage of white suspects who were armed. The last two lines report the F-test on the equality of the coefficients on percent black and white officers.

Finally, we estimate a panel version of our third test. The dependent variable is the percentage of all suspects, whether armed or not, who are black and who are killed by police. The explanatory variables of interest are the proportions of the police involved in such killings who are black, white, and Hispanic (Table 10). The results are consistent with those presented in Table 5. There is no significant difference between the coefficients corresponding to the proportions of black and white police officers with respect to the proportion of black suspects killed. As a robustness check, we estimated the same model limiting the sample to cases where the race of all the police officers is known. The results were the same.

Table 10. Do White Officers Kill Black Suspects More Often than Black Officers? Fixed-effects City Panel Data Regression

	Model 1	Model 2	Model 3
Percent white officer	-0.033	-0.026	-0.042
	(0.046)	(0.048)	(0.046)
Percent black officer	0.204	0.284	0.130
	(0.188)	(0.226)	(0.173)
Percent Hispanic officer	-0.106	0.054	-0.011
	(0.170)	(0.223)	(0.202)
Population		1.184	1.652
		(1.334)	(1.281)
Violent crime rate		-0.000	-0.008
		(0.016)	(0.016)
Percent black males 15-29		28.718	37.672
		(13.972)*	(13.747)**
Percent involved in violent crime			-0.056
			(0.048)
Percent involved in property crime			-0.004
			(0.058)
Percent drug related			0.000
			(0.129)
Percent suicidal			-0.200
			(0.058)**
Suspect age			-0.658
			(0.170)**
Percent more than one officer			-0.089
			(0.056)
Percent more than one suspect			0.084
			(0.267)
N	1,857	1,167	1,163
City & year fixed effects?	Yes	Yes	Yes
F test: pct white officer=pct black officer	1.62	1.95	1.05
Prob>F	0.203	0.163	0.307

Notes. Robust standard errors in parentheses; * $p<0.05$; ** $p<0.01$. The dependent variable is the percentage of black suspects killed by the police. The last two lines report the F-test on the equality of the coefficients on percent black and white officers.

All models use robust standard errors. Re-estimating using clustered standard errors did not change the results. All results, programs, and data are available in the online appendix.

7. Summary and Conclusion

Using a new dataset, we investigate three hypotheses concerning discrimination. The first tests whether the probability of an unarmed black suspect being killed by a white officer is equal to the same probability for unarmed white suspects. Using incident-level data, we find some evidence, in two out of four models, that this hypothesis is rejected, implying that white officers are more likely to kill an unarmed black suspect than those of other races. However, in those cases where the officer was not alone, where the suspect was caught committing a violent crime, or the department is unionized, the probability that an unarmed black suspect would be killed by a white police officer is not significantly different from the probability that a white officer would kill an unarmed white or Hispanic suspect.

At the incident level, these tests cannot tell us whether police systematically treat black and white suspects differently for reasons other than individual racial animus. For example, politicians or administrators might require officers of all races to treat suspects in poor neighborhoods differently from suspects in more affluent neighborhoods. However, these influences could be at least partially controlled for in the city-level fixed-effects models.

When we aggregate to city-year panels, we find that the proportion of unarmed black suspects killed by white officers is not significantly different from the proportion of unarmed white suspects killed by white officers. This raises the possibility that the original finding using incident-level data could be the result of unobserved heterogeneity which omits city-level data such as history, climate, and culture. We also find no evidence in the panel analyses that white officers discriminate against Hispanic suspects or suspects of races other than white, black, or Hispanic.

The second hypothesis is that, in the absence of discrimination, the probability of an unarmed black suspect being killed by a white officer is equal to the probability of being killed by a black or Hispanic officer. This test reveals no difference among officers of different races with respect to the probability of killing an unarmed black suspect. This result is confirmed by the corresponding panel data analysis.

The third hypothesis is that the probability of a black suspect, armed or unarmed, being killed by a white officer is equal to the probability of a black suspect being killed by a black or Hispanic officer. Because some of the relevant data is not available, we must assume that the probability of a black suspect encountering a white officer is adequately controlled by including demographic variables for the city and the police department in the regressions. We find that there is no significant difference between the probability of a black suspect being killed by a white officer and a black suspect being killed by a black or Hispanic officer. These findings are confirmed by the panel data analysis.

Despite the potential importance of body cameras, the presence of such cameras seems to have no significant effect on killings by police officers. The fact that additional evidence can be provided by the camera does not seem to alter the behavior of officers.

The finding that discrimination by white police officers expressed as killing unarmed black suspects at higher rates than suspects of other races is insignificant if the officer is not alone implies that officers acting alone are either under more stress or are more willing to express their racial prejudice, than those who have backup (or witnesses). Perhaps having fewer white officers being forced to act alone will result in fewer lives lost.

The online appendix is available here.
https://crimeresearch.org/wp-content/uploads/2021/09/Do_white_police_officers_unfairly_target_black_suspects-2.zip

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Notes

Note 1. Sherwin Lott provided extremely valuable help on the model in this paper. We thank seminar participants at George Mason University Economics Department and Mark Ramseyer for helpful comments.

Note 2. Jasmine Lee and Haeyoun Park, "In 15 High-Profile Cases Involving Deaths of black suspects, One Officer Faces Prison Time", New York Times, December 7, 2017 (https://www.nytimes.com/interactive/2017/05/17/us/black-deaths-police.html).

Note 3. https://still4hill.com/2016/07/08/hillary-clinton-calls-for-national-guidelines-for-use-of-force/

Note 4. http://webappa.cdc.gov/sasweb/ncipc/dataRestriction_inj.html and http://www.icd10data.com/ICD10CM/Codes/V00-Y99/Y35-Y38/Y35-

Note 5. The FBI UCR data from 1976 to 1998 is available here (http://www.bjs.gov/content/pub/pdf/ph98.pdf). Data for other more recent years are available from annual FBI UCR reports (e.g., https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s.-2015/tables/expanded_homicide_data_table_14_justifiable_homicide_by_weapon_law_enforcement_2011-2015.xls). When conflicts existed in the numbers reported by the FBI, we used the most recent years for which that data were available.

Note 6. Even the media generally understands the missing data in the FBI numbers on justifiable homicides by police. Rob Barry and Coulter Jones, "Hundreds of Police Killings Are Uncounted in Federal Stats", Wall Street Journal, December 3, 2014 (http://www.wsj.com/articles/hundreds-of-police-killings-are-uncounted-in-federal-statistics-1417577504). John R Lott, Jr., "Obama's false racism claims are putting cops' lives in danger", New York Post, July 8, 2016 (http://nypost.com/2016/07/08/obama-should-stop-smearing-cops-by-calling-them-racist/).

Note 7. The cases missed by the Washington Post in 2015: Andre Larone Murphey, Norfolk, Nebraska, January 7, 2015; Jonathan Paul Pierce, Port St. Joe, Florida, February 11, 2015; Jose E. Herrera, Delano, California, April 22, 2015; Jonathan Nelson, Albertville, Alabama, May 19, 2015; Curtis David Johnson, Huntsville, AL, June 4, 2015; Andrew Ellerbe, Philadelphia, Pennsylvania, June 5, 2015; Estevan Andrade Gomez, Farmersville, California, July 18, 2015; Juan Adolfo Ibarra, Houston, Texas, July 20, 2015; Stephen Ray Brown, Choctaw, Oklahoma, July 20, 2015; Allan F. White III, Cleveland, Tennessee, July 28, 2015; Pablo C. Tiersten, Kansas City, Kansas, August 20, 2015; Nicholas Alan Johnson, San Bernardino, California, September 18, 2015; Jarek Kozlowski, Gardnerville, Nevada, October 16, 2015; Jeffrey Womack, Houston, Texas, October 16, 2015; Larry Busby, Old Town, Florida, October 29, 2015; Brian Crawford, Houston, Texas, October 30, 2015; Unknown, San Juan, Puerto Rico, November 3, 2015; and Unknown, Fontana, California, November 20, 2015.

Note 8. http://andrewgelman.com/2016/07/14/about-that-claim-that-police-are-less-likely-to-shoot-black suspects-than-whites/

Note 9. http://policingequity.org/wp-content/uploads/2016/07/CPE_SoJ_Race-Arrests-UoF_2016-07-08-1130.pdf

Note 10. https://www.washingtonpost.com/national/study-finds-police-fatally-shoot-unarmed-black-men-at-disproportionate-rates/2016/04/06/e494563e-fa74-11e5-80e4-c381214de1a3_story.html

Note 11. https://www.nytimes.com/interactive/2017/us/politics/ferguson-effect.html

Note 12. Julia Jacobo, "Charlotte Police to Release Full Body and Dashboard Camera Videos of Shooting of Keith Scott", ABC News, September 30, 2016 (http://abcnews.go.com/US/charlotte-police-release-full-body-dashboard-camera-videos/story?id=42487682).

Note 13. Office of Public Affairs, US Department of Justice, "Justice Department Announces $20 Million in Funding to Support Body-Worn Camera Pilot Program", US Department of Justice, May 1, 2015 (https://www.justice.gov/opa/pr/justice-department-announces-20-million-funding-support-body-worn-camera-pilot-program).

Note 14. Although not reported, we find that officers of race other than white or black do not kill black suspects with probabilities significantly different from white officers.

Note 15. Adding these variables does not affect the results with respect to the discrimination tests in Table 5. The one case where two of these variables was significant (model 4), using cameras on guns significantly increases the probability that a black suspect killed by police will be found to be armed and that increasing the number of part-time sworn officers significantly reduces that probability. All results are available in the online appendix.

Note 16. We cannot simply add city effects to the cross-section regressions because they would be perfectly collinear with the intercept for those cities with only one incident, reducing the usable data in Table 3 for example from 777 to 138.