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Do #AllLivesMatter? An Evaluation of Race and Excessive Use of Force by Police

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Abstract There is anecdotal evidence showing that African-Americans are more likely to be subjected to excessive use of force by police than are people of other races. The counterargument is that these issues are not related to race and there are other factors at work. There have been several high-profile cases, such as those in Ferguson, Cleveland, and Baton Rouge. In this study, we estimate the effect of race on excessive use of force incidents using a new dataset comprising citizen complaints against the Chicago Police Department. Our findings show that not only does race play a role in excessive use of force complaints, but also that race plays a role in which complaints are sustained. Our study also highlights the importance of having data on which to perform rigorous empirical analysis in order to inform policymakers.

Keywords Excessive use of force · Race · Chicago police department

JEL J10 · J15 · K00 · K42

Introduction

There is a lot of anecdotal evidence showing African-Americans (both men and women) are more likely to be subjected to excessive use of force by police than are people of other races. The names Eric Garner, Michael Brown, Tamir Rice, and Sandra Bland are all too familiar to the public. Recent incidents added the names Alton Sterling and Philando Castile to that list. Another incident occurred in Chicago in October 2014 when 17-year-old African-American male Laquand McDonald was shot 16 times by a white police officer. Protests over the lack

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of action by the Chicago Police Department (CPD) and the subsequent release of the video, after 400 days of the shooting, led Mayor Rahm Emanuel to authorize a review of the department by the Chicago Police Accountability Task Force (2016). The task force released its report in April 2016, having found that the CPD has systemic problems with racism and that the McDonald shooting was not the only incident of an officer-involved shooting of an African-American. The task force analysis of the CPD found that African-Americans are more likely to have been shot, more likely to have been tasered, and more likely to have been subjected to traffic stops and vehicle searches than people of other races. In January 2017, the Department of Justice issued a report that found racial disparities in use of force and deficiencies in accountability practices plagued the CPD.

It is against this backdrop that we want to evaluate whether African-Americans are really subject to more adverse police behavior. This study questions whether African-Americans are more likely to experience excessive use of force by police, controlling for a variety of factors including individual demographics, officer characteristics, and location. Research on the excessive use of force in the economics literature is scarce.[1] Fryer (2016) was the first to really delve into this issue by going down to the granular level of police-citizen interactions. His findings came from several robust datasets, including the Police-Public Contact Survey, police narratives, and data from ten police departments in three states. He found that race is a factor in use of force incidents, but not in officer-involved shootings. One of the concerns of this study was that because the data came directly from police narratives, there was a possibility that the information did not accurately portray the incidents in question. Police narratives have been shown to favor officers in officer-involved shootings as well as in other examples of excessive use of force by police (Balko 2016). Our study is different from Fryer's study because we use data from a unique dataset on citizen complaints to the CPD, which we use to gain evidence of excessive use of force, although our results can only speak to the likelihood of excessive use of force complaints relative to other types of complaints. Our findings highlight the importance of understanding the role of both race and police culture as factors in adverse police behavior.

Racial Bias and Policing

If police do exhibit racial bias, we have to understand the motivation and the nature of how that bias occurs. Trying to elicit the nature of police bias has been the subject of much debate in [recent] economics literature. Knowles et al. (2001) developed a model of motorist and police behavior as a means of explaining racial bias in policing. In their model, police have to determine whether to stop a motorist to see if that person is hiding drugs or other illegal contraband. Their study showed that if there is no discrimination on the part of law enforcement, then the proportion of searches yielding contraband should be equal across all races. They tested their model using data on vehicle searches in Maryland. They found no evidence of racial prejudice. This spawned further work on racial bias in policing. Anwar and Fang (2006) expanded the model to allow for heterogeneity in trooper behavior by looking at trooper characteristics and by incorporating other factors about the motorists aside

[1] Prendergast (2007) and Dharmapala et al. (2016) develop theoretical models to explain punitive behavior in law enforcement.

from race. Looking at pedestrian stop data from the New York City Police Department, Gelman et al. (2007) found that African-Americans and Hispanics are subject to more searches than are people of other races.

Other research has highlighted the importance of identifying the racial composition of a police force and what significance it has relative to racial bias. Close and Mason (2007), using a sample of Florida vehicle searches, found that although white officers make up the largest share of the police force and do most of the searches, they have the lowest hit rates relative to Hispanic and African-American officers. That is, percentage-wise white officers were less likely to find contraband. The authors also found that, in Florida, an African-American male driver has the highest probability of being searched when compared to drivers of any other race, male or female. Antonovics and Knight (2009), using data on vehicle searches in Boston, found that an officer is more likely to search a driver of a different race than his or her own. Donohue et al. (2001) found increases in the minority share of police lead to greater arrests of whites, but no discernible difference in the arrests of non-whites.

Another factor that needs to be accounted for in these models is the goal of the police force. Is the goal to find contraband or is it to minimize crime? Dominitz and Knowles (2006) showed that while having equal search success rates is consistent with arrest rate maximization, it is inconsistent with crime minimization. The assumption here is that the crime rate among races differs and therefore, in order to minimize crime, the search rates should reflect the levels of crime. Persico and Todd (2006), using data from vehicle searches in Wichita, found empirical support that searches are conducted to maximize efficiency in finding contraband. Brock et al. (2012) attempted to relax assumptions made in the research to find better tests of taste-based discrimination. Bunzel and Marcoul (2008) developed a model to show that police need not be individually racist for discriminatory policies or actions to persist. In other words, if there is a misperception about the level of crime done by a specific race, this will affect the behavior of that officer even if that officer does not hold discriminatory beliefs. There is not a consensus yet in the literature on racial bias in policing, though empirical analysis has been primarily focused on traffic stops. Like Fryer (2016), this study seeks to further this research by analyzing excessive use of force incidents.

Data

The data used in this study is taken from the Citizens Police Data Project (CPDP) out of the Invisible Institute. The information was the outcome of Freedom of Information Act requests of the CPD.[2] The full dataset spans the years from 2002 to 2008 and 2011–2015. It contains information on allegations, citizen demographics, police officer characteristics, and final dispositions. Our sample is taken from the second span of years, 2011–2015, as it has location information that we use in the empirical models.

The dependent variable is an indicator that takes the value of one if the allegation is of excessive force, and zero otherwise. While we talk about the excessive use of force

[2] The data were collected by the Invisible Institute but no effort was made to verify the accuracy of information given by the CPD.

incidents, we have to remember these are allegations of excessive use of force and not necessarily actual incidents. The database contains complaints levied towards the CPD so we can only estimate the likelihood of excessive use of force complaints relative to other types of complaints. In filing a complaint, an individual has to file an affidavit at the same time. To file this affidavit, people need to go to a single location in mid-Chicago that is not accessible by public transportation. This location was moved from the south side of Chicago to its new location. Because of this fact, we expect a downward bias on the number of incidents of excessive force because individuals who would have filed a complaint would be discouraged due to the increased cost of filing. However, there may be an upward bias on the number of incidents because individuals may be more likely to file a complaint when it comes to excessive use of force than with another type of complaint, like witnessing an officer under the influence. It is important to keep these factors in mind when interpreting the results.

There are several categories of excessive force, depending on whether the officer was on or off duty, whether an injury occurred, and whether there was a firearm used. For the models, we aggregate all the types of excessive use of force into one. Since the universe contains only complaints, we want to estimate the likelihood of reporting excessive force relative to other types of complaints (drug abuse, DUIs, bribes, etc.). Nearly 85% of the incidents were when the officer was on duty.[3] A second dependent variable accounts for the adjudication of the complaint. This is an indicator that takes the value of one if the allegation was sustained, and zero otherwise. This second model provides a stronger analysis of the relationship between the CPD and the community because it will express the responsiveness of the department to community concerns.

In the criminal justice literature, the determinants of police use of force have been analyzed by many scholars (Friedrich 1980; Garner et al. 2002). These determinants fall into four broad categories: individual, situational, organizational, and community. The consensus is that the primary factor in use-of-force incidents is situational, depending on a suspect's characteristics and the seriousness of the crime (Riksheim and Chermak 1993). Unfortunately, our dataset is limited in the potential determinants that can be included in the model. In other studies, the basic variables included are the gender, age, and race of the suspect and the gender and experience level of the officer (Alpert et al. 2004; Johnson 2011). In addition to those variables, we include the officer's rank and the officer's history, such as the number of allegations and the number of disciplinary actions against the officer. Table 1 displays the descriptive statistics.

Table 1 shows that excessive force complaints only accounted for 13.1% of all complaints. Out of all the complaints, only 5.2% of the complaints adjudicated are sustained. For complaints about excessive use of force, only 2.2% of those complaints are sustained. The largest proportion of the sample group comprises African-American males who reside on the south side of Chicago. Only a quarter of the officers are African-American, while over 80% of the officers are male.

[3] In Table 1 in the online supplementary appendix, we show the breakdown of excessive use of force by types. In Table 2 of the same appendix, we run models looking at different types of excessive use of force complaints (on-duty vs. off-duty and injury vs. non-injury).

Table 1 Descriptive statistics ($N = 9802$)

	Mean	Std. Dev.	Min	Max
Dependent variable				
Excessive force complaints	13.1%	0.34	0	1
Sustained complaints (excessive force)	5.2% (2.2%)	0.22	0	1
Complainant characteristics				
Gender (Male = 1)	60.5%	0.49	0	1
African-American	67.1%	0.47	0	1
Age	41.5	12.05	14.8	98.4
Southside dummy	62.8%	0.48	0	1
Officer characteristics				
African-American officer	25.5%	0.44	0	1
Male officer	81.8%	0.39	0	1
Officer birth year	1971	9.66	1916	1989
Officer appointment year	2000	6.85	1955	2014
Officer history				
Allegation count	6.64	6.61	1	50
Discipline count	0.20	0.64	0	12

Data source: Citizens Police Data Project (2016).

Results

The method used is a probit model because the dependent variable is binary. The first model answers the question about which factors increase the likelihood that a complaint of excessive force is cited relative to other complaints. The empirical specification is given in (1):

$$Prob(ComplaintofExcessiveForce) = f(Race, OtherDemographics, OfficerCharacteristics) \quad (1)$$

The second model answers the question about which factors increase the likelihood that complaints are sustained.

$$Prob(ComplaintSustained) = f(Race, OtherDemographics, OfficerCharacteristics) \quad (2)$$

Fixed effects are included in each of the models to control for time and location. Location data is available only for the second time span, which covers the five years from 2011 through 2015. This dataset is not a panel since we are not following the same individuals or departments over time, so we do not use a within estimator. Since crime tends to increase in Chicago during the summer months when it gets hot (Cohn 1990), we also estimate models using quarter fixed effects instead of year

fixed effects. The location data available is at the police beat level, so we include beat fixed effects. Standard errors are clustered at the beat level. The first model estimates the effect of race on excessive use of force incidents. Table 2 provides the results of the model.

Table 2 shows consistent effects after adding in officer characteristics, year or quarter fixed effects, and beat fixed effects. The results show that African-American males are more likely to report incidents of excessive force relative to other types of

Table 2 Probit model of the effect of race on excessive use of force complaints

	(1)	(2)	(3)	(4)
Complainant characteristics				
Gender (male = 1)	−0.0981	−0.0770	−0.0440	−0.0325
	(0.094)	(0.233)	(0.551)	(0.662)
African-American	0.0896	0.0631	0.1267	0.1356
	(0.102)	(0.303)	(0.095)	(0.076)
Male*African-American	0.1652**	0.1233*	0.1554*	0.1676*
	(0.002)	(0.038)	(0.035)	(0.024)
Age	−0.0085***	−0.0082***	−0.0087***	−0.0088***
	(0.000)	(0.000)	(0.000)	(0.000)
Officer Characteristics				
African-American officer		0.0977	0.2259*	0.2289*
		(0.249)	(0.016)	(0.015)
Male officer		0.1965***	0.2241***	0.2243***
		(0.001)	(0.000)	(0.000)
Male*African-American officer		0.1675*	0.2862***	0.2807***
		(0.012)	(0.000)	(0.000)
Officer birth year		−0.0004	−0.0013	−0.0012
		(0.862)	(0.601)	(0.626)
Officer appointment year		0.0062	0.0167***	0.0170***
		(0.092)	(0.000)	(0.000)
Officer history				
Allegation count		0.0097***	0.0118***	0.0118***
		(0.000)	(0.000)	(0.000)
Discipline count		−0.0886**	−0.0953**	−0.0922**
		(0.005)	(0.006)	(0.008)
Constant	−0.8358***	−12.848*	−36.092	−33.608***
	(0.000)	(0.027)	(0.709)	(0.000)
Number of observations	11,465	9801	9342	9243
Officer rank dummies	No	Yes	Yes	Yes
Year fixed effects	No	No	Yes	No
Quarter fixed effects	No	No	No	Yes
Location (Beat) fixed effects	No	No	Yes	Yes

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; p-values reported in parentheses; Standard errors are clustered at the beat level (not reported in table); Data source: Citizens Police Data Project (2016) for years 2011 to 2015.

complaints. Older individuals are less likely to report excessive force. Male officers are more likely to be the subject of excessive use of force complaints than are female officers, and African-American male officers are more likely to be the subject of excessive use of force complaints than are male officers of any other race. Less experienced officers are more likely to be the subject of excessive use of force complaints than are more experienced officers. Officer history is important as officers who have more previous allegations are more likely to be the subject of excessive use of force complaints. Officers who have more disciplinary actions against them are less likely to be the subject of excessive use of force complaints. This effect may show that discipline works as it gives an incentive to these officers to exercise more caution when dealing with citizens.

Studies show the south side of Chicago experiences higher crime and has a greater police presence (Hertz 2017). We re-estimate the model including an indicator variable for the south side, which is designated using geocoded data. Table 3 provides the results of the model. The full results from Table 2 are provided for comparative purposes along with the marginal effects.[4]

The first column of Table 3 shows that African-American males are 9.2% more likely to report incidents of excessive use of force relative to other types of complaints. In the second column, we estimate separately the impact of the south side location on complaints of excessive use of force. African-American males are now 12.3% more likely to report incidents of excessive use of force. However, men who live on the south side are less likely to report excessive use of force. This is an intriguing result given that the location to file an affidavit with the complaint was moved from the south side of Chicago to mid-Chicago. African-American males who live on the south side are not significantly correlated with the reporting of excessive use of force.

African-American officers are 3.3% more likely to be subject to complaints of excessive use of force, however this effect goes away when controlling for the south side. Male officers are 1.7% more likely to be subject to complaints of excessive use of force and this effect nearly doubles when controlling for the south side. African-American male officers are less likely to be subject to complaints of excessive use of force than their white counterparts. Sanga (2014) finds that officers tend to discriminate in favor of their own race, which may explain this finding especially when controlling for the south side. Less experienced officers are more likely to be subject to complaints of excessive use of force than their more experienced counterparts, though the magnitude of this effect is small. The experience finding is found in Brandl et al. (2001). These findings confirm what is known about the CPD and the problems with policing that the African-American community has experienced.

The previous models looked at complaints levied against Chicago police officers. This does not mean that these are actual incidents of excessive use of force and therefore we could only speak to likelihood of filing a complaint of excessive use of force relative to other complaints. The next model looks at the complaints that have been adjudicated

[4] The marginal effects reported for the interaction terms are calculated as the difference between the expected odds of the interactive term relative to a White male. The calculation is the same for the officer characteristics. Ai and Norton (2003) develop a program to calculate marginal effects for interaction terms in non-linear models, but it is only for models with a single interaction terms. Since our model has multiple interaction terms, we follow Buis (2010) by reporting ratios relative to a baseline odds ratio.

Table 3 Probit model of the effect of race on excessive use of force complaints, controlling for southside

	(1)	(2)
Complainant characteristics		
Gender (Male = 1)	−0.0325 [0.033]	−0.0606 [0.026]
	(0.662)	(0.499)
African-American	0.1356 [0.003]	0.1042 [0.005]
	(0.076)	(0.259)
Southside dummy		−0.0357 [−0.038]
		(0.743)
Age	−0.0088 [−0.002]	−0.0091 [−0.002]
	(0.000)***	(0.000)***
Officer characteristics		
African-American officer	0.2289 [0.033]	0.1628 [0.007]
	(0.015)*	(0.062)
Male Officer	0.2243 [0.017]	0.2161 [0.033]
	(0.000)***	(0.000)***
Male*African-American officer	0.2807 [−0.029]	0.2258 [−0.022]
	(0.000)***	(0.001)***
Officer birth year	−0.0012 [−0.0002]	−0.0007 [−0.0001]
	(0.626)	(0.760)
Officer appointment year	0.0170 [0.003]	0.0128 [0.003]
	(0.000)***	(0.001)**
Interactions		
Male*African-American	0.1676 [0.092]	0.2006 [0.123]
	(0.024)*	(0.022)*
African-American*southside		−0.0860 [0.023]
		(0.309)
Male*southside		−0.2045 [−0.040]
		(0.032)*
Male*African-American*southside		−0.0247 [0.059]
		(0.764)
Number of observations	9243	9801

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; p-values reported in parentheses; Marginal effects reported in brackets; All models include other officer characteristics, officer rank, officer history, and quarter fixed effects; Beat fixed effects included in model (1) only; Standard errors are clustered at the beat level (not reported in table); Data source: Citizens Police Data Project (2016) for years 2011 to 2015.

and sustained. As shown in Table 1, only 5.5% of all complaints are sustained and only 2.1% of excessive use of force complaints are sustained. Table 4 provides the results.

For all complaints to the CPD, African-Americans are less likely to see their complaints sustained. Older complainants are more likely to have their complaints sustained. When looking at the interaction of complainant characteristics, African-Americans are less likely to see their complaints sustained, whether they are male, live on the south side, or both. For officers, male African-American officers are more likely

Table 4 Probit model of sustained complaints

	All complaints	Excessive force only
Complainant characteristics		
Gender (Male = 1)	0.1391[0.013]	0.1318 [−0.004]
	(0.198)	(0.744)
African-American	−0.9017 [−0.073]	−0.5754 [−0.040]
	(0.000)***	(0.232)
Southside dummy	0.1069 [0.013]	−0.1342 [−0.029]
	(0.422)	(0.798)
Age	0.0290 [0.002]	0.0390 [0.002]
	(0.000)***	(0.000)***
Interactions		
Male*African-American	−0.5936 [−0.275]	−1.2145 [−0.195]
	(0.000)***	(0.029)*
African-American*southside	−0.6587 [−0.276]	
	(0.000)***	
Male*Southside	0.3954 [0.037]	0.1318 [−0.042]
	(0.000)***	(0.759)
Male*African-American*southside	−0.6128 [−0.291]	−1.9706 [−0.227]
	(0.000)***	(0.003)**
Officer Characteristics		
African-American officer	0.1708 [0.028]	−0.4717 [0.025]
	(0.147)	(0.490)
Male Officer	−0.0966 [−0.002]	−0.0745 [0.007]
	(0.245)	(0.850)
Male*African-American officer	0.2908 [0.082]	0.5318 [0.037]
	(0.002)**	(0.250)
Officer birth year	−0.0014 [−0.0001]	−0.0029 [−0.0001]
	(0.729)	(0.870)
Officer appointment year	0.0030 [0.0002]	−0.0033 [−0.0001]
	(0.603)	(0.892)
Number of observations	9411	922

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; p-values reported in parentheses; Marginal effects reported in brackets[a]; Standard errors calculated using robust estimator of variance (not reported); All models include other officer characteristics, officer rank, officer history, and quarter fixed effects. Data source: Citizens Police Data Project (2016) for years 2011 to 2015.

[a] The marginal effects reported for the interaction terms are calculated as the difference between the expected odds of the interactive term relative to a White male. The calculation is the same for the officer characteristics. Ai and Norton (2003) develop a program to calculate marginal effects for interaction terms in non-linear models, but it is only for models with a single interaction terms. Since our model has multiple interaction terms, we follow Buis (2010) by reporting ratios relative to a baseline odds ratio.

to have complaints levied against them sustained. When we restrict the sample to only those complaints that are about the excessive use of force, most of the significant effects go away. The effects that retain significance are African-American men and African-

American men who live on the south side. These groups are 1.95% and 2.3%, respectively, less likely to have their complaints of excessive use of force sustained than are any other group. These findings are especially compelling given the low rate of sustained complaints. This answers the question of why African-Americans do not feel comfortable trying to seek redress for complaints through the normal channels. They do not feel that they will receive justice and the findings bear this out.

Conclusion

This paper looks at the role race plays in the excessive use of force incidents in Chicago, from 2011 to 2015, using a database of citizen complaints against the Chicago Police Department. Our results show that race plays a role in excessive use of force complaints and in the adjudication of complaints toward officers in the CPD. We find that African-American men are more likely to file complaints of excessive use of force. We also find that African-American men who live in the south side of Chicago are less likely to have their complaints sustained. These results confirm the findings of the Chicago Police Accountability Task Force in its report on the CPD (Police Accountability Task Force 2016).

There are some limitations to this study. Since this database contains complaints levied by citizens, it is not a representative sample of actual incidents. When dealing with complaint data, we cannot say for certain whether there is a underreporting bias or an over-reporting bias (Hickman 2006). Another limitation of data is that the data has not been independently verified outside of the CPD. Given these limitations, it is still fascinating to find that race does have an effect on excessive use of force complaints. The database exhibits the potential difficulty the community has in seeking redress from excessive use of force incidents. In an article from the Chicago Reporter, 58% of the cases from 2011 to 2014 were not investigated because there were no affidavits filed with the complaint (Catolico 2016). One avenue for future work would be to follow the literature on race and traffic stops and try to identify whether the race effect is due to discrimination or some other factor (Antonovics and Knight 2009; Close and Mason 2007; Knowles et al. 2001).

An important implication of this study is that it shows the need for better data in understanding police behavior. There have been calls to create national databases on police and police behavior. There have been programs designed to undertake the collection of this data. Several states have begun the collection of data on police-citizen interactions.[5] However, the implementation of these programs has been slow. In 2014, the White House launched the Police Data Initiative, which asks local law enforcement agencies to provide statistics on police-citizen interactions. To date, only 53 police departments have provided data (Jackman 2016). Improved data collection and rigorous analyses should help law enforcement implement the reforms that have been called for and improve the relations between the community and police.

[5] Utah has started tracking the deployment of tactical units, while California has a database on three types of police-citizen interactions.

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