

ECONOMICS OF CRIME AND INCARCERATION[‡]

Disparities in Police Award Nominations: Evidence from Chicago[†]

By NAYOUNG RIM, BOCAR BA, AND ROMAN RIVERA*

Recent studies on the racial disparities in policing have largely focused on police-civilian interactions and have uncovered evidence of bias in enforcement (Coviello and Persico 2015; Nix et al. 2017; Fryer 2019; Goncalves and Mello 2018; West 2018; Knox, Lowe, and Mummolo forthcoming). However, little work has been done to study the internal dynamics within police departments, where minority representation is often promoted as a solution to biased policing and is accomplished through diversity initiatives. Given the hierarchical nature of police departments and the decentralized nature of promotions, minority and female representation may be hindered by internal biases. This study provides evidence of racial and gender disparities by focusing on a key metric of internal recognition among Chicago Police Department (CPD) officers: departmental award nominations.

This paper bridges the vast literature on labor market discrimination with studies on law enforcement and policing. In this paper, we refocus questions of racial disparities onto the internal workings of the department itself. Specifically, we examine supervisor nominations for departmental awards to test whether

police officers are biased against their minority colleagues. We use award nominations, which are measures of performance recognition, rather than promotions because promotions are rare within police departments. Only 3 percent of police officers in the CPD were promoted to sergeant between 2007 and 2015.

Analyses of police departments' internal dynamics have hitherto been hindered by a lack of microdata. We construct a novel dataset on policing activity, supervisor assignments, and award nominations by merging multiple publicly available datasets using identifying officer characteristics. Using this novel dataset on the CPD, we study patterns of award nominations and are able to control for traditional measures of policing activity, such as arrests, uses of force, and complaints. We find a sizable and persistent nominations gap between black and white officers as well as between female and male officers.

I. Data and Empirical Strategy

We combine multiple datasets to construct a personnel database of CPD officers: demographics, rank, tenure, district assignment, awards, arrests, uses of force measured by Tactical Response Reports filings, and complaints.¹ We focus on the period between 2007 to 2015 to maximize the overlap in years across datasets.

In determining the existence of a racial or gender nominations gap, it is important to control for confounding factors that may differentially impact officer outcomes that are also correlated with race or gender. For example, black officers tend to be older than white and Hispanic officers in our data, and older officers, who tend to be

*Discussants: Anne Piehl, Rutgers University; Erdal Tekin, American University; Benjamin Hansen, University of Oregon; Justin McCrary, Columbia University.

*Rim: Department of Economics, US Naval Academy (email: rim@usna.edu); Ba: University of Pennsylvania Law School (email: bocarba@law.upenn.edu); Rivera: Department of Economics, Columbia University (email: rgr2122@columbia.edu). Weizaho Sun provided excellent research assistance. We thank Sam Stecklow, the Invisible Institute, and Craig Futterman for help with the data. The views expressed herein do not reflect the position of the Chicago Police Department or US Naval Academy. All errors are our own.

[†]Go to <https://doi.org/10.1257/pandp.20201118> to visit the article page for additional materials and author disclosure statement(s).

¹For a complete description of the database construction, please see Rim, Ba, and Rivera (2019b).

TABLE 1—BASELINE CHARACTERISTICS OF NEW POLICE OFFICERS

Sample:	Everyone	White	Black	Male	Female
Birth year	1981.51	1982.40	1979.54	1981.74	1980.60
Start month	Jun 2011	Jul 2011	Feb 2011	Jul 2011	May 2011
Training (months)	18.38	18.18	18.81	18.38	18.38
Complaints	0.45	0.44	0.54	0.47	0.37
Uses of force	0.66	0.72	0.56	0.74	0.32
Arrests	23.45	24.80	21.16	24.30	20.07
Observations	1,715	840	282	1,369	346

Note: This table lists summary statistics for 1,715 probationary police officers' measures while they were in the academy.

more experienced, are more likely to be nominated. If we do not control for age, then we will mistakenly attribute a black-white performance disparity to race. A more relevant concern is the assignment of officers to differing neighborhoods in terms of crime. Chicago is a highly segregated city in terms of race and income, and thus crime rates are higher in black and Hispanic neighborhoods. As such, black officers, who are differentially more likely to be assigned to black districts, will also be assigned to districts that are disproportionately high crime. This will afford them more opportunities to win award nominations by conducting more arrests and other crime-minimizing activities relative to their colleagues assigned to lower-crime districts.

We exploit the CPD's recruitment process to mitigate these confounding factors. In this process, potential recruits must first pass a written exam, then are randomly called to enroll in the police academy. Training lasts for 18 months, during which officers are considered probationary. After the probationary period, newly minted police officers are assigned to districts based on CPD need, avoiding self-selection issues; only a small select number of officers can choose their district (Police Accountability Task Force 2016). We define all officers who start in the same district in the same quarter to be part of the same "cohort." Because start date and initial district assignment are essentially randomly and independently determined, we are able to compare minority officers (black or female) to majority officers (white or male) *within the same cohort* and attribute any nomination gaps to differential treatment by the supervisor.

We test the assumption that cohorts are randomly constructed by comparing baseline characteristics of all new officers. Table 1 presents

the average characteristics of all new officers in our analysis sample measured during their probationary period. In our analysis sample, the average new police officer is about 27 years old and began training in June 2011. The average probationary period is 18.4 months, and during this period, the average new officer accrued 0.45 civilian complaints, filed 0.66 Tactical Response Reports, and made a total of 23.45 arrests.

There is some heterogeneity in officer metrics by race and gender. Black (female) probationary officers are slightly older than their white (male) counterparts. This difference is not very large—about three years and one year on average for black and female officers, respectively. Blacks and females also use less force than their white and male counterparts: 0.56 versus 0.72 and 0.32 versus 0.74, respectively. There are similar differences in arrests, with female officers making four fewer arrests than males and black officers making three fewer arrests than whites. These differences, though significant, are economically small: 4 fewer arrests over the entire probationary period equates to 0.22 fewer arrests per month. Further, the lack of significant differences in civilian complaints ensures that minority officers are not being drawn from different risk profiles compared to their majority colleagues. In summary, while officer demographics, start month, and training length suggest that cohorts are randomly constructed, gender and racial differences in arrests and uses of force highlight the importance of including policing activity measures as controls in our analysis of racial and gender disparities in award nominations.

Using the sample of new officers, we estimate racial and sex gaps in annual award nominations among officers in the same cohort. The regression

model to estimate the minority-majority (black-white, female-male) gaps is

$$(1) \quad y_{it} = \beta_0 + \beta_1 Black_i + \beta_2 Female_i + \beta_3 Hispanic_i + \beta_4 Asian_i + \beta_5 NatAm_i + X_{it}\delta + u_{it}$$

where y_{it} is the number of award nominations officer i received in year t . The terms *Black*, *Female*, *Hispanic*, *Asian*, and *NatAm* are binary indicator variables equal to 1 if the officer is black, female, Hispanic, Asian, or Native American, respectively. The reference group is white male officers.

The variable X_{it} is a vector of controls including cohort fixed effects, year fixed effects, birth year fixed effects, tenure, complaints, arrests, and uses of force. To minimize endogeneity bias, we lag complaints, arrests, and uses of force by one year. To capture nonlinear relationships between the control variables and our outcome variable, we include second-order and third-order terms for tenure, complaints, arrests, and uses of force. Standard errors are clustered at the cohort level. As district assignment determines the environment in which officers work, we assume that conditional on cohort and officer policing activity, unobservable characteristics that influence awards will now be uncorrelated with race and gender.

II. Results

We present our estimates for $\hat{\beta}_1$ and $\hat{\beta}_2$ in Table 2, with each column including additional controls. Column 1 indicates that compared to a white officer in the same cohort, the average black officer will receive 7.5 fewer award nominations a year. Column 2 compares female and male officers and finds that female officers have on average 5.6 fewer nominations per year compared to a male officer in the same cohort. Relative to the average nomination rates for whites and males, these estimates indicate that black officers receive about 70 percent fewer nominations than white officers, and female officers receive about 55 percent fewer nominations than male officers.

Controlling for all officer demographics as well as policing activity significantly reduces the magnitude of these results (column 3).

TABLE 2—RACIAL AND SEX DISPARITIES IN ANNUAL NOMINATIONS

	(1)	(2)	(3)	(4)
Black officer	-7.546 (1.496)		-4.067 (1.145)	-5.109 (1.415)
Female officer		-5.570 (0.539)	-2.279 (0.454)	-3.119 (0.489)
Black × female				3.149 (1.193)
Observations	4,057	4,057	4,057	4,057
Reference group mean	10.80	10.20	11.73	11.73
<i>Controls for</i>				
Cohort	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Demographics			Yes	Yes
Policing activity			Yes	Yes

Notes: This table reports the minority gap in annual nominations between officers who graduated from the police academy in the same quarter and started in the same unit. The reference group is white officers for column 1, male officers for column 2, and white male officers for columns 3 and 4.

The black-white gap declines by about 45 percent to a nominations gap of -4.1, while the female-male gap declines by about 60 percent to a gap of -2.3 nominations. Despite the decline in magnitude, both of these coefficients remain statistically significant at the 1 percent level. These estimates correspond to 34 percent fewer awards for black officers and 20 percent fewer awards for female officers relative to their majority-group colleagues. Put another way, a black officer who started in the same district in the same quarter as a white officer and with the same number of arrests, uses of force, and complaints receives 34 percent fewer nominations than his white colleague.

An important consideration is how race and gender interact. In column 4, we add a new variable of interest by interacting black and female. The coefficients for both white and female increase slightly in magnitude to -5.1 and -3.1, respectively, with a coefficient on the interaction of 3.1. These estimates remain statistically significant at the 1 percent level. The results indicate that gender does not significantly impact the treatment of black officers; that is, black officers—both male and female—receive 43 percent (-5.1) fewer nominations than non-black male officers. However, gender is important among non-black officers, with non-black females receiving 26 percent (-3.1) fewer nominations than non-black male officers.

Next, we explore a potential mechanism for the disparate treatment of minority officers. Given that black and female officers make fewer arrests on average, our results may be a reflection of statistical discrimination, wherein supervisors only observe an imprecise signal of officer quality (e.g., number of arrests) and are less likely to nominate minority officers because their signal or policing activity is lower on average. One way to test this assumption is to examine the minority nominations gap as the signal gets stronger. If statistical discrimination can explain the nominations gap, we would expect the gap to decrease higher in the annual nominations distribution.

To explore this potential mechanism, we perform a quantile regression on every quantile between the fifth and ninety-fifth percentile of annual award nominations. Specifically, we estimate equation (1) for every nomination quantile between the fifth and ninety-fifth percentiles. The estimates for $\hat{\beta}_1$ and $\hat{\beta}_2$ are graphed in Figure 1.

Contrary to the statistical discrimination story, we see that as the quantiles increase, the gap between minority and majority nominations becomes wider. In other words, the distribution of nominations for minority officers becomes increasingly distinct from that of majority officers. At the fifth percentile of nominations, the black-white gap is -0.53 and the female-male gap is -0.61 . At the median number of nominations, the black-white gap is -2 and the female-male gap is -1.78 . At the ninetieth percentile of award nominations, the black-white gap is -4.76 and the female-male gap is -3 . All of these estimates are statistically significant at the 5 percent level. Further, a Wald test finds that the twenty-fifth percentile and seventy-fifth percentile estimates for both the black-white and female-male gaps are statistically significantly different from each other.

III. Conclusion

While the results presented in this paper are descriptive, they provide suggestive evidence that supervisors may be biased against their minority officers. Black (female) officers are significantly less likely to be nominated for awards compared to their white (male) colleagues, even after controlling for cohort, age, experience, and key policing activity metrics such as arrests, uses of force, and complaints. Furthermore, we find that

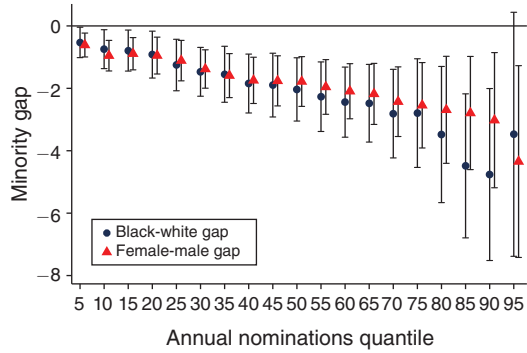


FIGURE 1. RACIAL AND SEX DISPARITIES BY NOMINATION QUANTILE

Notes: This figure reports black-white and female-male disparities in annual nominations by nomination quantile. These estimates control for cohort, year, birth year, tenure, complaints, arrests, and uses of force. Wings depict 95 percent confidence intervals.

the discrepancy is likely not a result of statistical discrimination on the part of nominators, as the minority nominations gap grows among higher award percentiles. This is consistent with a theory of implicit preferences rather than a theory of statistical discrimination.

Our findings have important policy implications. While recent research on policing has focused on police-civilian interactions, studies on interactions within police departments are becoming an important avenue in the exploration of crime and community safety. For example, Miller and Segal (2019) finds that a demographically diverse police force may improve policing quality. Further, disparate treatment of minority officers within police departments may perpetuate racial and sex disparities in promotion and advancement, thereby counterbalancing any efforts to increase diversity representation among officers. The resulting lack of diversity in higher-ranking officers may portend worse outcomes for minority communities (Rim, Ba, and Rivera 2019a).

REFERENCES

Coviello, Decio, and Nicola Persico. 2015. "An Economic Analysis of Black-white Disparities in the New York Police Departments Stop-and-Frisk Program." *The Journal of Legal Studies* 44 (2): 315–60.

- Fryer, Roland G., Jr.** 2019. "An Empirical Analysis of Racial Differences in Police Uses of force." *Journal of Political Economy* 127 (3): 1210–61.
- Goncalves, Felipe, and Steven Mello.** 2018. "A Few Bad Apples?: Racial Bias in Policing." <https://static1.squarespace.com/static/58d9a8d71e5b6c72dc2a90f1/t/5cfe39c1db1f980001595d4d/1560164805693/GoncalvesMello.pdf>.
- Knox, Dean, Will Lowe, and Jonathan Mumolo.** Forthcoming. "The Bias Is Built in: How Administrative Records Mask Racially Biased Policing." *American Political Science Review*.
- Miller, Amalia R., and Carmit Segal.** 2019. "Do Female Officers Improve Law Enforcement Quality? Effects on Crime Reporting and Domestic Violence." *The Review of Economic Studies* 86 (5): 2220–47.
- Nix, Justin, Bradley A. Campbell, Edward H. Byers, and Geoffrey P. Alpert.** 2017. "A Bird's Eye View of Civilians Killed by Police in 2015." *Criminology and Public Policy* 16 (1): 309–40.
- Police Accountability Task Force.** 2016. *Recommendations for Reform: Restoring Trust between the Chicago Police and the Communities they Serve*. Chicago: Chicago Police Accountability Task Force.
- Rim, Nayoung, Bocar Ba, and Roman Rivera.** 2019a. "Community Ties and Police Uses of force." Unpublished.
- Rim, Nayoung, Bocar Ba, and Roman Rivera.** 2019b. "In-Group Bias and the Police: Evidence from Award Nominations." https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=3134&context=faculty_scholarship.
- West, Jeremy.** 2018. "Racial Bias in Police Investigations." https://people.ucsc.edu/~jwest/articles/West_RacialBiasPolice.pdf.