Comments

An Empirical Analysis of Racial Differences in Police Use of Force: A Comment

Steven N. Durlauf

University of Chicago

James J. Heckman

University of Chicago

"An Empirical Analysis of Racial Differences in Police Use of Force" (Fryer 2019) addresses a fundamental aspect of racial inequality in America. The paper suggests that there is evidence of discrimination against African Americans in police use of force except for officer-involved shootings. Given the importance of the issues involved, clarity is needed in understanding how this or any other piece of research contributes to understanding the nature of contemporary racial inequality and injustice.

In this comment, we focus on the paper's failure to find empirical differences in police shootings by race. This finding has received the most publicity and is the one that the paper most strongly defends: "[T]he data do more to provide a more compelling case that there is no discrimination in officer-involved shootings than they do to illuminate the reasons behind racial differences in nonlethal uses of force" (Fryer 2019, 1216). In our judgment, this paper does *not* establish credible evidence on the presence or absence of discrimination against African Americans in police shootings. We applaud analyses of data about police use of force of any type. But it is important to state clearly what the available data do and do not prove. The evidence provided in this paper fails to give any reason to conclude that discrimination is absent.

The paper's empirical claims on police shootings amount to calculating conditional probabilities of shootings and determining whether race matters. The absence of racial differences is treated as sufficient evidence for not further exploring the presence of discrimination, just as the presence of such differences is treated as prima facie evidence of discrimination in the use of force at lesser levels of police response than shooting. Formally, let Sh_i denote a binary variable for whether i is shot (or shot at), S_i denote the initiation of an interaction of i with the police (which we sometimes refer to as "stops" to be concrete, although technically the data for those used as comparisons are arrests or other types of interaction), O_i denote conditioning variables used to capture legitimate reasons to discharge a weapon, and B_i and W_i whether the individual is black or white. The paper defines the absence of discrimination in shootings as

$$\Pr(Sh_i|S_i, O_i, B_i) = \Pr(Sh_i|S_i, O_i, W_i), \tag{1}$$

that is, equality of the probability of being shot, given that person i is "stopped," controlling for appropriate conditioning variables.

There are no good reasons to conclude that the equality of equation (1) implies the absence of discrimination. This is so for two distinct reasons.

First, the paper is based on administrative data that do not enable the author to determine the probability that a person is stopped in the first place (his sample is based on "stops"). Conditioning on an endogenous variable (S_i) is a classic route to selection bias. Keeping observed variables O_i implicit to simplify notation, equation (1) implies

$$\frac{\Pr(Sh_i, S_i|B_i)}{\Pr(S_i|B_i)} = \frac{\Pr(Sh_i, S_i|W_i)}{\Pr(S_i|W_i)} . \tag{2}$$

Suppose that $\Pr(S_i|B_i) > \Pr(S_i|W_i)$. By the logic of the paper, this constitutes evidence for discrimination against African Americans in terms of stops. When this inequality holds, the condition for equality in equation (1) can still hold even when discrimination in stops is present. In order for condition (1) to hold in the presence of bias in stops, it is necessarily the case that $\Pr(Sh_i, S_i|B_i) > \Pr(Sh_i, S_i|W_i)$, which is possible if the numerator and denominator probabilities move in precise synchrony, which to us seems implausible. It would be a numerical coincidence that these differences just happened to offset each other and produce condition (1). Adding to the problem of interpretation are the substantial standard errors on the race coefficient in the logistic regression used to test condition (1).

The problem of selection is in fact more general. Equality or inequalities in either direction for condition (1) can mask bias. The conditional probabilities of condition (2) illustrate that there are two decisions involved in producing condition (1): the initial interaction and the decision on whether or not to discharge a weapon. The interaction decision can

produce differences in the characteristics of blacks and whites that matter for the subsequent use of a weapon. Suppose that biased police randomly stop blacks but stop whites only when there is some reason (unobserved by the analyst) that events after a stop will lead to the justified discharge of a weapon. If blacks are equally likely to be shot at in this case, that would reflect bias in the discharge-of-weapon decision because of the differences in group characteristics. And if blacks are shot at less frequently in the sense of equation (1), there may still be bias in each stage of the process.

A second problem in the paper is with the controls O_i, which are used to measure contexts of the interactions ("stops") culminating in force. Many of these control variables are reported by the police involved in the shootings. They are likely to be endogenous variables. There is every incentive for police to justify shootings through spurious descriptions of the contexts of the stops. Readers are told,

> It is exceedingly difficult to know how prevalent this type of misreporting bias is (Schneider 1977). Accounting for contextual variables recorded by police officers who may have an incentive to distort the truth is problematic. Yet, whether or not we include controls does not alter the basic qualitative conclusions. (Fryer 2019, 1215)

This caveat does not adequately address the problem of endogenous reporting. Unless the endogeneity of reported contexts is controlled, the equal probability finding (eq. [1]) identifies nothing. The fact that conditioning or not conditioning on the available control variables does not alter the findings is immaterial to the relevant question: Would appropriate controls for actual circumstances reveal a racial disparity in shootings that is otherwise absent? That is the reason for using controls in the first place. If it is the case that the control variables are manipulated to avoid the appearance of impropriety, use of them can mask racial bias.

Both of these problems stem from Fryer's failure to model interactions between police and civilians as a process. Suppose that there are pre-interaction characteristics $C_{i,\text{pre}}$ and postinteraction characteristics $C_{i,\text{post}}$ that are assumed to be valid predictors of stops and shooting conditional on stops. By the logic of the model in this paper, the absence of discrimination requires two conditions that reflect the two stages of the process that culminates in a shooting:

$$\Pr(S_i | C_{\text{pre},i}, B_i) = \Pr(S_i | C_{\text{pre},i}, W_i) \tag{3}$$

and

$$\Pr(\text{Sh}_i | S_i, C_{\text{pre},i}, C_{\text{post},i}, B_i) = \Pr(\text{Sh}_i | S_i, C_{\text{pre},i}, C_{\text{post},i}, W_i). \tag{4}$$

Information about the conditional probabilities $\Pr(\mathrm{Sh}_i|S_i, O_i, B_i)$ and $\Pr(\mathrm{Sh}_i|S_i, O_i, W_i)$ does not serve to determine whether conditions (3) and (4) hold.

The probabilities used by Fryer condition on two plausibly endogenous variables. Equations (3) and (4) involve two sets of latent variables, which presumably relate to the observed measures of interaction characteristics O_i but whose relationship with the unobserved latent variables is unknown. The absence of any considered analysis of the process by which the endogeneity of interactions (stops) might induce selection bias and the endogeneity of reports might induce mismeasurement undermines any conclusion that there is no discrimination in police shootings.

The considerations presented here have previously appeared in various places in the existing literature on measuring discrimination. Heckman and Siegelman (1993) and Heckman (1998) emphasize the difficulties in achieving identification of bias in the presence of differences in the race-specific distributions of unobserved variables. Brock et al. (2012) show how, in assessing bias in police stops, one needs explicit descriptions of costs and benefits to individual officers in order to determine sources of racial differences in interactions. In the context of racial profiling, they show how the standard condition for no animus in stops—equal conditional guilt probabilities—can in fact be evidence of animus under plausible specifications of the police decision problem. Knox, Lowe, and Mummolo (2020) provide a deep and wide-ranging discussion of the problems involving evaluation of police bias using administrative data—as Fryer does—when conditioning on initial stops. They develop and apply methods for partial identification of bias, depending on the nature of the data under study. They provide bounds for bias levels for Fryer's nonlethal force analyses. While taking different perspectives on the use of statistics and theory in interpreting evidence, each of these papers has the same message: differences in conditional probabilities for black and white outcomes are not dispositive of discrimination without a deeper analysis of the behaviors of police and civilians.

References

Brock, William A., Jane Cooley, Steven N. Durlauf, and Salvador Navarro. 2012. "On the Observational Implications of Taste-Based Discrimination in Racial Profiling." *J. Econometrics* 166 (1): 66–78.

Fryer, Roland G., Jr. 2019. "An Empirical Analysis of Racial Differences in Police Use of Force." *J.P.E.* 127 (3): 1210–61.

Heckman, James J. 1998. "Detecting Discrimination." *J. Econ. Perspectives* 12 (2): 101–16.

Heckman, James J., and Peter Siegelman. 1993. 'The Urban Institute Audit Studies: Their Methods and Findings." In *Clear and Convincing Evidence: Measurement of Discrimination in America*, edited by Michael Fix and Raymond J. Struyk, 187–258. Washington DC: Urban Inst. Press.

Knox, Dean, Will Lowe, and Jonathan Mummolo. 2020. "Administrative Records Mask Racially Biased Policing." *American Polit. Sci. Rev.* 114 (3): 619–37.

Schneider, Anne L. 1977. "Portland (OR) Forward Record Check of Crime-Victims Final Report, December 1977." Oregon Res. Inst. and US Dept. Justice, Eugene.