

**Comment on Roland Fryer's  
"An Empirical Analysis of Racial Differences in Police Use of Force"<sup>1</sup>**

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"An Empirical Analysis of Racial Differences in Police Use of Force" 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 is the finding that has received the most publicity in public policy discussions and which the paper most strongly defends:

"...the data do more to provide a 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."

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 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.

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<sup>1</sup> We have benefitted from comments by an editor, two referees, and Rafeh Qureshi.

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 arrestees),  $O_i$  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 as:

$$\Pr(Sh_i | S_i, O_i, B_i) = \Pr(Sh_i | S_i, O_i, W_i), \quad (1)$$

i.e., 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 (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, (1) implies

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

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 (1) can still hold even when discrimination in stops is present. In order for (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 is a numerical curiosity that these differences just happen to offset each other and produce (1). Adding to the problem of interpretation are the substantial standard errors on the race coefficient in the logistic regression used to test (1).

The problem of selection is in fact more general. Equality or inequalities in either direction for (1) can mask bias. The conditional probabilities of condition (2) illustrate that

there are two are 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 which matter for the subsequent use of a weapon. Suppose that biased police randomly stop blacks but only stop whites 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 the group characteristics. And if blacks are shot at less frequently in the sense of (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, 1997). 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.”

This caveat does not adequately address the problem of endogenous reporting. Unless the endogeneity of reported contexts is controlled, the equal probability finding (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 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  $C_{i,pre}$  and post-interaction characteristics  $C_{i,post}$  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:

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

and

$$\Pr(Sh_i | S_i, C_{pre,i}, C_{post,i}, B_i) = \Pr(Sh_i | S_i, C_{pre,i}, C_{post,i}, W_i) \quad (4)$$

Information about the conditional probabilities in  $\Pr(Sh_i | S_i, O_i, B_i)$  and  $\Pr(Sh_i | S_i, O_i, W_i)$  do not serve to determine whether (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, Cooley, Durlauf, and Navarro (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 non-lethal 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

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