Decomposing racial disparities in pedestrian stops: An application of the Kitagawa-Oaxaca-Blinder decomposition for nonlinear models

Kasey J. Eickmeyer, PhD, Senior Research Methodologist
Jon Lloyd, MSc, Research & Development Associate
John Brindel, Director of Research & Development

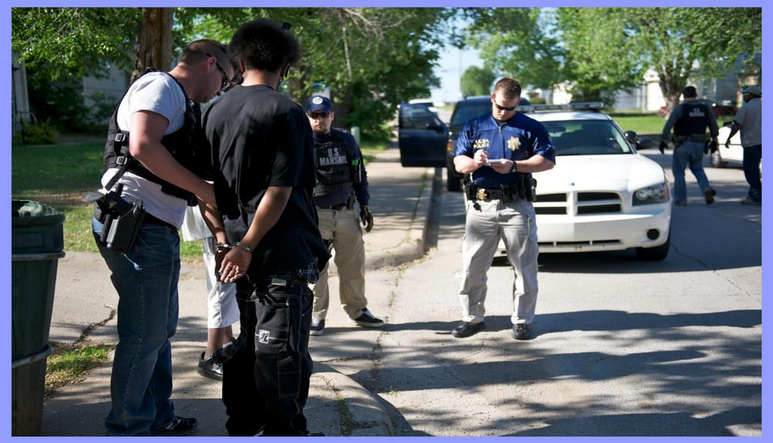
Research Question

How do we explain both the ubiquitous racial disparity in police activity across the U.S. and the heavy variation in disparities between municipalities?

Background

Studies show that police stop Black motorists and pedestrians at significantly higher rates than White ones, regardless of offending behavior. Prior studies have found that:

- Spatial characteristics such as economic disadvantage, residential instability, and violent crime levels exacerbate these disparities.
- Demographic characteristics including the racial composition of a neighborhood, and "out of place" location-centric policing can also exacerbate disparities.
- Residential segregation and gentrification may also affect policing inequalities.



Data & Measures

Stop Data: Stanford Open Policing Project (SOPP) data represents over 18 million pedestrian stops made by local police agencies in 41 cities and 21 states in the U.S. from 2012-2018.

- **Pedestrian stop rates**: *Number of stops/Population at risk.*
- **Location and year of stop.**

Tract Data: The 2016-2018 5-Year American Community Survey (ACS) will provide tract-level demographic data.

- **Population below poverty level.**
- **Non-White population.**
- **Gentrification:** *Neighborhoods that change from a median income less than 50% of the median income for the MSA (gentrifiable) to higher (non-gentrifiable) compared to an average cumulative rank determined by:*
  - *Proportion of residents with college degrees.*
  - *Family income.*
  - *Home ownership rates.*
  - *Proportion of residents aged 30-444.*
  - *Proportion of White non-family households*
  - *Proportion of managerial/administrative workers.*
  - *Proportion with some college education.*
  - *Proportion living in poverty.*
  - *Proportion of Black residents.*
- **Segregation:** *Index of dissimilarity measure between Black and White and Latinx and White tract populations.*

Methodology

- Negative Binomial Regression: Spatial lag predicts rate of stops for Black, Latinx, and White populations in a given census tract.
- Kitagawa-Blinder-Oaxaca Decomposition:
  - $\Delta\bar{Y} = (\bar{X}_A - \bar{X}_B)\widehat{\beta_B} + \bar{X}_B(\hat{\beta}_A - \hat{\beta}_B) + (\bar{X}_A - \bar{X}_B)(\hat{\beta}_A - \hat{\beta}_B)$
    - $\Delta\bar{Y}$: Predicted difference in average rates of stops experienced by Black and White (Group A) or Latinx and White (Group B) pedestrians.
    - $\bar{X}$: Mean values of explanatory variables for each group.
    - $\hat{\beta}$: Estimated regression coefficients.
- Stop rate difference can be separated into two proportions:
  - Differences explained by differences in group characteristics and coefficients
  - Remainder of differences which remain unexplained, which may be attributable to officer's inequitable behavior.

Theoretical Significance

Focal Concerns Theory: Structural influences may distort an officer's assessment of blameworthiness, community protection, and consequences of making a stop, resulting in an inequity between stops.

Routine Activity Theory: Officer discretion, major events which upset routine activities, and the routine activities of officers may result in inequity between stops.

Identity Threat: Racially disparate policing may be contextualized within social control practices such as gentrification, impoverization, and segregation that aim to reduce a perceived threat to White hegemonic power.

This Photo by Unknown Author is licensed under CC BY-ND

Center For POLICING EQUITY

Acknowledgement

Data access, funding, and other resources were provided by the Center for Policing Equity. All analyses were done on behalf of the Center for Policing Equity.