

# The Color Line in the Issuance of Speeding Tickets: Uncovering Systemic Racial Biases in Texas Traffic Stops

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**Abstract:** Police stops represent a low-level interaction that can affect how individuals view the legitimacy of the state. Moreover, research highlights how fines and fees imposed by the justice system reproduce inequality by burdening marginalized Americans with state-levied debt. Most prior research examining racial disparities in policing has focused on the policing of black and Hispanic Americans, primarily because these groups are known to be at high risk of overpolicing but also because data constraints often prevent the examination of other groups. Using administrative records for all traffic stops made by Texas State Patrol from 2006 through 2017, we test for racial disparities in the issuance of citations to black, Hispanic, and Asian drivers relative to white drivers. We find significant racial disparities, even when considering only speeding-related stops. We see disparities for black, Hispanic, and, especially, Asian drivers in the issuance of speeding citations. We also find that black and Hispanic drivers are significantly more likely to be searched, conditional on being stopped, but no more likely to have contraband found on them than white drivers. We argue that these encounters have the potential to shape not just individual views of the legitimacy of policing but also financial well-being via the costs of the citations themselves and subsequently increased costs of maintaining automotive insurance.

Racial Disparities | Policing | Data Analysis

There is a long history of racial bias in policing in the United States that endures to this day (1, 2), and evidence suggests that the legacies of racism in American policing and the criminal justice system as a whole shape how individuals view the legitimacy of the state and their willingness to interact with it (3–6). Recent research on legal financial obligations has also highlighted how the fines and fees imposed on those who interact with the criminal justice system – even at low levels – reproduce inequality along racial and ethnic dimensions and burden marginalized Americans with state-levied debt (7–9). Most of the prior research examining racial disparities in policing has focused on disparities in the policing of Black and Hispanic Americans, which is understandable given the roots of American police forces in slave patrols. Yet some scholars acknowledge that their desire to examine potential policing disparities of other non-white groups is hampered by the limitations of existing data (10). We use administrative records for all traffic stops ( $N = 27,426,840$ ) made by Texas State Patrol between January 1, 2006 and December 31, 2017 to test for racial disparities in the issuance of speeding-related citations ( $N = 11,842,734$ ), arguing that these encounters have the potential to shape not just individual views of the state and the legitimacy of policing but also individual financial well-being via the costs of the citations themselves

as well as the increased costs of maintaining automotive insurance after receiving a citation. Notably, because of the size of our data set and the diversity of the Texas population, we are able to examine disparities in citation issuance for Black, Hispanic, and Asian/Pacific Islander drivers relative to white drivers. We find significant racial disparities in the issuance of citations, even when we consider only speeding-related stops. As with prior research on police stops, we see disparities for Black and Hispanic individuals, but we also find that Asian/Pacific Islander drivers are significantly more likely to receive a citation for speeding than white drivers. In supplemental analyses we examine racial disparities in the decision to search drivers conditional on having stopped them. Here our findings closely match those from pedestrian stop data: we find that Black and Hispanic drivers are significantly more likely to be searched than white drivers, but they are no more likely to have contraband found on them than white drivers. Instead we find that Hispanic drivers are significantly less likely to be found carrying contraband than white drivers. We conclude by discussing the implications of these racial disparities for individual finances, population level disparities in monetary sanctions, and racial differences in legal cynicism.

## Findings.

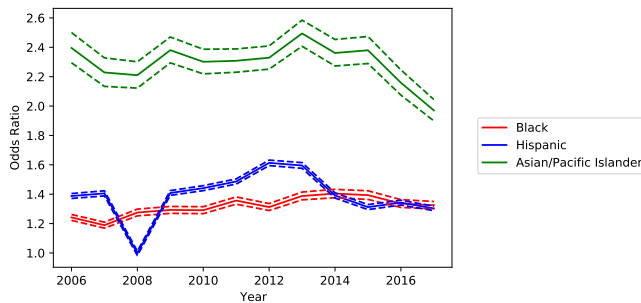
Table 1 displays the descriptive statistics for all speeding stops (of any type) and all speeding in a school-zone stops in our data. Citations are issued in 31 percent of all speeding-related stops and 53 percent of school zone speeding stops. Fig. 1 displays odds ratios of being issued a citation conditional on being stopped for any speeding-related offense for Black, Hispanic, and Asian/Pacific Islander drivers relative to white drivers across all years, holding county-type and holiday constant. We see that all minority drivers have significantly higher odds of receiving a citation than white drivers (dotted lines indicate 95% confidence intervals), with Black and Hispanic drivers being approximately 1.3 to 1.5 times as likely to receive a citation as white drivers and Asian/Pacific Islander drivers being about twice as likely to a receive speeding citation after being stopped compared to white drivers.

Table 2 displays results from logistic regression models predicting receipt of a citation among drivers who were stopped

## Significance Statement

120 word max

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**Fig. 1.** Odds ratios of being issued a citation conditional on being stopped for any speeding-related offense for Black, Hispanic, and Asian/Pacific Islander drivers relative to white drivers.

for speeding in a school zone. When we restrict analysis to this better defined speeding violation we no longer see as large a disparity in citation issuance between non-white drivers, but we continue to see that all non-white drivers – Black, Hispanic, and Asian/Pacific Islander alike – have significantly greater odds of receiving a citation than white drivers. The Black odds ratio is 1.32, the Hispanic odds ratio is 1.41, and the Asian/Pacific Islander odds ratio is 1.46, indicating that non-white drivers are 30-50 percent more likely to receive a citation for speeding in a school zone than white drivers stopped in the same type of county.

#### Supplemental Analyses.

Prior work finds that racial bias appears to influence the decision whether to stop a driver during daylight hours (11). Because we examine outcomes after having already been stopped, at which point officers have the ability to perceive drivers' race during a close interaction, we do not anticipate that time of day will meaningfully alter our findings. To test this assumption we have run our primary analyses separately for daytime versus nighttime stops, and we see remarkably similar patterns (see Fig. 2). The Asian/Pacific Islander-white discrepancy in citation rates appears to be slightly larger during daylight hours than at night, but the general patterns in racial disparities hold true at both times of day. We have also explored racial disparities in the likelihood of being searched conditional on being stopped for a speeding violation (see Fig. 3). While Asian/Pacific Islander drivers are no more likely to be searched than white drivers, we find large racial disparities for Black and Hispanic drivers. Hispanic drivers are approximately twice as likely to be searched as white drivers after having been stopped for a speeding-related offense, and Black drivers are nearly three times as likely to be searched. In supplemental analyses we examine how often contraband is found, conditional on having been searched (see Fig. 4). We find that contraband is found half as often among searched Hispanic drivers relative to searched white drivers, and we find no significant differences in the likelihood of contraband being found for Black or Asian/Pacific Islander drivers relative to white drivers.

#### Forthcoming Analyses.

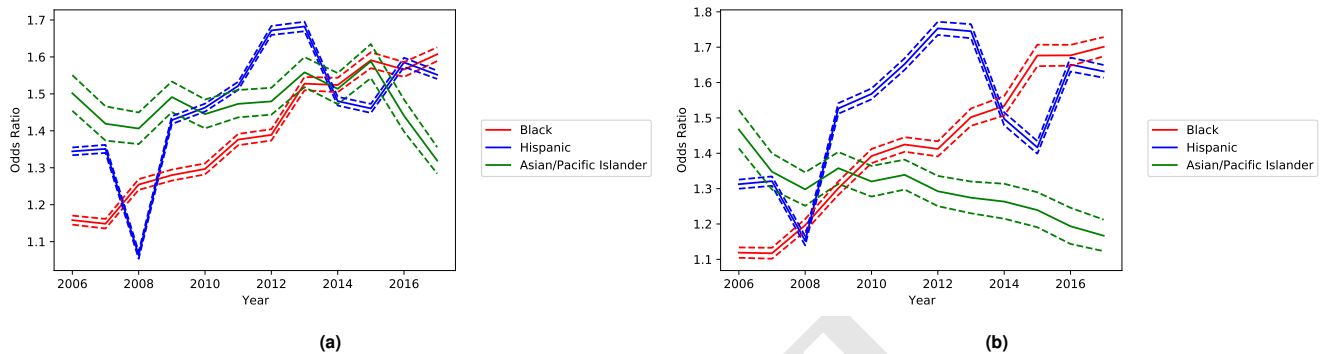
We plan to incorporate county-level fixed effects and assess how the disparities we find vary by county type and county demographics in future analyses. Finally, we plan to create rough estimates of the expenses that derive from “excess stops”

**Table 1. Descriptive Statistics of Speeding Violations**

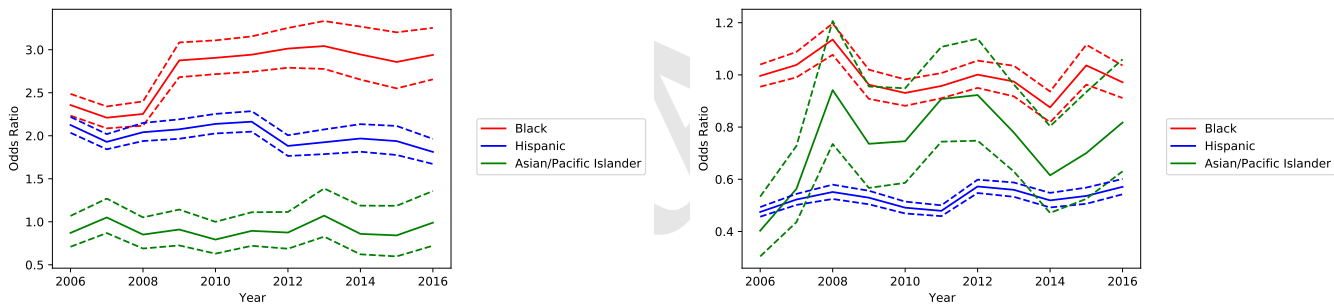
| Descriptive Statistic                              | Value/Count              |
|--|--------------------------|
| Years covered                                      | 2006-01-01 to 2017-12-31 |
| # of traffic stops (All violations)                | 27,426,840               |
| <b>Speeding-only Records</b>                       |                          |
| # of traffic stops with speeding only violation(s) | 11,842,734               |
| <b>Speeding violation/record (%):</b>              |                          |
| Only one speeding violation                        | 99.994%                  |
| More than one speeding violation                   | 0.006%                   |
| <b>Citation Issued (%):</b>                        |                          |
| Yes  | 30.68%                   |
| No   | 69.32%                   |
| <b>Drivers' Race (%):</b>                          |                          |
| White  | 64.77%                   |
| Black  | 8.92%                    |
| Hispanic   | 24.49%                   |
| Asian/Pacific Islander                             | 1.82%                    |
| <b>County type (%):</b>                            |                          |
| Metropolitan                                       | 52.00%                   |
| Micropolitan                                       | 18.91%                   |
| Non-core   | 29.09%                   |
| <b>Driver's gender (%):</b>                        |                          |
| Male   | 65.16%                   |
| Female   | 34.84%                   |
| <b>Speeding-school zone Records</b>                |                          |
| # of traffic stops (Speeding-school zone)          | 19489                    |
| <b>Citation Issued (%):</b>                        |                          |
| Yes  | 53.47%                   |
| No   | 46.53%                   |
| <b>Drivers' Race (%):</b>                          |                          |
| White  | 53.99%                   |
| Black  | 8.44%                    |
| Hispanic   | 35.35%                   |
| Asian/Pacific Islander                             | 2.22%                    |
| <b>County type (%):</b>                            |                          |
| Metropolitan                                       | 60.04%                   |
| Micropolitan                                       | 24.07%                   |
| Non-core   | 15.89%                   |
| <b>Driver's gender (%):</b>                        |                          |
| Male   | 54.86%                   |
| Female   | 45.14%                   |

**Table 2. Logistic Regression Results for Citation Issuance in School-Zone Speeding Stops**

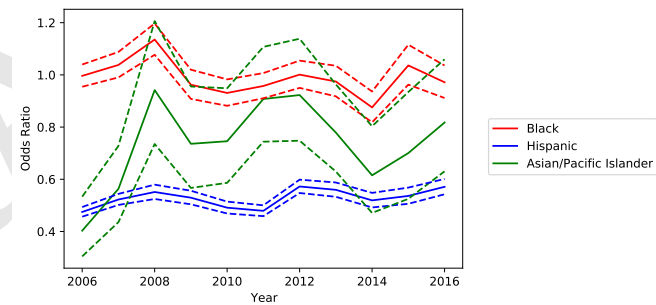
| Variable                     | Coefficient | Odds Ratio (with Confidence Interval) | p-value              |
|------------------------------|-------------|---------------------------------------|----------------------|
| constant                     | 0.2664      | 1.3052 (1.247-1.3661)                 | $< 1 \times 10^{-7}$ |
| holiday                      | -0.9844     | 0.3737 (0.3214-0.4344)                | $< 1 \times 10^{-7}$ |
| Race: Asian/Pacific Islander | 0.3807      | 1.4633 (1.1963-1.7898)                | 0.0002               |
| Race: Black                  | 0.278       | 1.3205 (1.1868-1.4693)                | $< 1 \times 10^{-7}$ |
| Race: Hispanic               | 0.3467      | 1.4144 (1.328-1.5064)                 | $< 1 \times 10^{-7}$ |
| County: Micropolitan         | -0.6485     | 0.5228 (0.4876-0.5606)                | $< 1 \times 10^{-7}$ |
| County: Non-core             | -0.5125     | 0.599 (0.5525-0.6494)                 | $< 1 \times 10^{-7}$ |



**Fig. 2.** Odds ratios for Black, Hispanic, and Asian/Pacific Islander drivers getting cited after being pulled over during (a) day; and (b) night.



**Fig. 3.** Odds ratios of being searched for Black, Hispanic, and Asian/Pacific Islander drivers relative to white drivers when stopped for a speeding-related violation.



**Fig. 4.** Odds ratios of contraband being found conditioned on being searched for Black, Hispanic, and Asian/Pacific Islander drivers relative to white drivers.

– that is, the number of additional stops that non-white drivers experience relative to white drivers in Texas – in terms of both the cost of speeding tickets and the implications of those citations for drivers' insurance rates.

### Conclusion.

While prior policing studies have often found that Hispanic and, especially, Black Americans are subject to more frequent and more aggressive police stops than white Americans, our findings make two unique contributions. First, we find that racial disparities extend beyond the decision to stop drivers to the decisions to ticket and search drivers. Other researchers have found racial disparities in the decision to search drivers and pedestrians (citations), but to our knowledge we are the first to reveal racial disparities in the decision to ticket drivers conditional on having stopped them. Second, we extend upon prior literature on racial disparities in policing by incorporating the experiences of Asian/Pacific Islander Americans and, in doing so, find striking disparities in citation rates compared to white drivers. It is important to reiterate that the racial

biases we uncover here are over and above the ones that factor into deciding whether to stop a vehicle (11). As such, our findings do not reflect the full extent of racial bias to which non-white drivers are subject. Instead they highlight the fact that race appears to influence officer behavior at every step of the decisionmaking process with regard to whether to stop drivers, whether to cite them, and whether to search them. While the disparities we find are consequential in their own right for suggesting unequal treatment by law enforcement officers based on drivers' perceived race and ethnicity, we also argue that these disparities in citation issuance and searches have larger consequences at both the individual and societal level. From the individual perspective, speeding citations entail both direct and indirect costs. Speeding fines in Texas generally cost between 200 and 300 dollars but can be as high as 500 dollars (12–14), and most car insurance companies raise drivers' insurance rates by 9-49% for 3 to 5 years after a speeding citation is issued (15). A recent analysis suggests that the cost of a speeding ticket plus increased insurance rates over the following years totals approximately 800 dollars over

the course of three years for Texas drivers (16). According to the 2021 Survey of Household Economics and Decision making (17), one-third of adults do not have enough cash on hand to cover an unexpected expense of 400 dollars. Among Hispanic and Black adults, 46 and 52 percent, respectively, would not be able to cover a 400 dollar unexpected expense with cash. Thus, even one speeding ticket could represent a significant financial challenge for a large portion of American drivers. At the societal level, these racial disparities in traffic citations and searches are likely to feed into legal cynicism and even legal estrangement among non-white drivers, potentially weakening their confidence in American legal and political institutions writ large (3–6).

**ACKNOWLEDGMENTS.** Please include your acknowledgments here, set in a single paragraph. Please do not include any acknowledgments in the Supporting Information, or anywhere else in the manuscript.

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