

Update on Racial Disparities in Traffic Stops Statistics from the Texas Department of Public Safety Using 2016 Data

Frank R. Baumgartner, Leah Christiani, and Kevin Roach¹
University of North Carolina at Chapel Hill

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On September 20, 2016, we provided testimony to the Texas House of Representatives, Committee on County Affairs, on racial disparities in the likelihood of search for motorists stopped by the Texas Department of Public Safety from 2011 through 2015. This short memo updates some key findings for 2016.

Facing evidence that hundreds of thousands of Hispanic drivers were listed as Caucasian in the DPS records, the DPS made changes to its data collection procedures resulting in important changes in the share of Hispanics reported each year. This has apparently been quite effective, judging from the data. Table 1 shows the number of traffic stops by race and gender, including White, Black, and Hispanic drivers.

Table 1. Race and Gender of Drivers Stopped by the Texas DPS, 2011-2016.

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| <u>Numbers</u> | | | | | | | |
| White Male | 1,261,649 | 1,147,814 | 966,730 | 781,722 | 643,588 | 566,626 | 5,368,129 |
| White Female | 325,940 | 580,060 | 500,999 | 411,049 | 351,224 | 320,888 | 2,490,160 |
| Black Male | 177,839 | 171,325 | 144,107 | 119,641 | 110,080 | 122,592 | 845,584 |
| Black Female | 90,635 | 88,343 | 76,211 | 62,355 | 60,796 | 67,255 | 445,595 |
| Hispanic Male | 193,048 | 216,040 | 221,225 | 244,178 | 262,338 | 489,777 | 1,626,606 |
| Hispanic Female | 67,794 | 74,912 | 79,487 | 91,250 | 103,331 | 207,742 | 624,516 |
| Total | 2,116,905 | 2,278,494 | 1,988,759 | 1,710,195 | 1,531,357 | 1,774,880 | 11,400,590 |
| <u>Percentage</u> | | | | | | | |
| White Male | 59.60 | 50.38 | 48.61 | 45.71 | 42.03 | 31.92 | 47.09 |
| White Female | 15.40 | 25.46 | 25.19 | 24.04 | 22.94 | 18.08 | 21.84 |
| Black Males | 8.40 | 7.52 | 7.25 | 7.00 | 7.19 | 6.91 | 7.42 |
| Black Female | 4.28 | 3.88 | 3.83 | 3.65 | 3.97 | 3.79 | 3.91 |
| Hispanic Male | 9.12 | 9.48 | 11.12 | 14.28 | 17.13 | 27.59 | 14.27 |
| Hispanic Female | 3.20 | 3.29 | 4.00 | 5.34 | 6.75 | 11.70 | 5.48 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| White | 75.00 | 75.83 | 73.80 | 69.74 | 64.96 | 50.00 | 68.93 |
| Black | 12.68 | 11.40 | 11.08 | 10.64 | 11.16 | 10.70 | 11.33 |
| Hispanic | 12.32 | 12.77 | 15.12 | 19.61 | 23.88 | 39.30 | 19.75 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Note: excludes drivers of other races.

While there was a steady increase in the Hispanic share of drivers from 2011 (12 percent) to 2015 (24 percent), the number increased dramatically to 39 percent of the total in 2016 after

¹ Baumgartner is Richard J. Richardson Distinguished Professor of Political Science at UNC-Chapel Hill and is corresponding author; Frankb@unc.edu. Roach and Christiani are PhD students in Political Science.

changes were made to DPS data collection procedures. Note that Black drivers are consistently approximately 11 to 13 percent of those stopped. The increase in share of Hispanic drivers corresponds to a decrease in share of White drivers, in particular in 2016. The DPS should be commended for correcting what appears to have been a significant data accuracy problem. It is remarkable that the White share of stops has decreased now from 75 at the beginning of the series to 50 after this error was corrected. The bulk of that shift can be attributed to the data correction in 2016.

In our previous analysis, we presented a logistic regression model predicting the likelihood that a driver would be searched following a traffic stop. Table 2 replicates our analysis from September 2016, for reference.

Table 2. Predicting Searches in Texas Highway Stops (From September 2016 analysis of 2011-2015 data)

| Variable | Males | Females |
|---|-----------|-----------|
| Black | 1.586 | 1.151 |
| Hispanic | 1.150 | 1.010 |
| 1-5 mph over limit | 4.398 | 5.421 |
| 6-10 mph over the limit | 0.711 | 0.651 |
| 11-15 mph over the limit | 0.498 | 0.427 |
| 16-20 mph over the limit | 0.574 | 0.487 |
| 21+ mph over the limit | 0.841 | 0.832 |
| Out of State | 1.354 | 1.756 |
| Log(Vehicle Age) | 1.588 | 1.755 |
| Black*Out of State | 1.232 | 1.259 |
| Hispanic* Out of State | 0.951* | 0.831 |
| Black Disparity Officer | 1.596 | 1.692 |
| Hispanic Disparity Officer | 1.414 | 1.324 |
| Black*Black Disparity Officer | 1.711 | 1.762 |
| Hispanic*Hispanic Disparity Officer | 1.820 | 1.748 |
| Constant | 0.0129 | 0.00648 |
| Observations | 6,239,282 | 3,105,515 |
| % of observations where a search occurred | 2.31 | 1.92 |
| Day of the week | Included | Included |
| Hour of the day | Included | Included |
| Pseudo R2 | 0.0525 | 0.0558 |

Note: All the coefficients are statistically significant at $p < .01$ except one, as indicated; * $p < .05$. Entries are logistic odds-ratios. We omit the standard errors here, but can provide them on request. An odds-ratio of 1.5 means the event is 1.5 times as likely (or 50 percent more likely) to occur compared to the baseline; 0.9 means it is 90 percent as likely, or 10 percent less likely. The model predicts which traffic stops will lead to a search of the driver or vehicle. The baseline or reference category is a White driver with in-state plates who is not speeding and who is stopped by an officer not identified as “high disparity”.

This model shows that, controlling for the relevant factors that can be included given the data that the DPS collects, Black male drivers are approximately 59 percent more likely to be searched than white males, and Hispanic drivers approximately 15 percent more likely. Among

females the differences are greatly reduced. The model also shows that being stopped for a very small speeding infraction is a great predictor of search, out of state plates generate a significantly higher likelihood of search, that this is substantially increased for black drivers with out of state plates, and that all these things are of course enhanced if the officer involved has a pattern in their stops of searching minority drivers more than twice as often as white drivers. Crucially, however, the disparities are above and beyond only those which can be attributed to these “bad apple” officers. All this was already reported in our 2016 report.

Table 3 updates that model with some small revisions through 2016.

Table 3. Predictors of Search, Male Drivers, Texas Department of Public Safety, 2011-2016.

| | |
|---------------------------------------|-----------|
| Black | 2.34 |
| Hispanic | 1.53 |
| Speeding < 10 | 1.16 |
| Speeding 10-14 | 0.50 |
| Speeding 15-19 | 0.54 |
| Speeding 20+ | 0.77 |
| Vehicle Age | 1.06 |
| Black x Vehicle Age | 0.97 |
| Hispanic x Vehicle Age | 0.97 |
| Out of State Plates | 1.32 |
| Black x Out of State Plates | 1.10 |
| Hispanic x Out of State Plates | 0.91 |
| Black Disparity Officer | 1.72 |
| Hispanic Disparity Officer | 1.23 |
| Black x Black Disparity Officer | 1.70 |
| Hispanic x Hispanic Disparity Officer | 1.90 |
| Hour of Day | Included |
| Day of Week | included |
| N | 7,406,308 |
| Log likelihood | -789,808 |

Note: Coefficients are logistic regression odds-ratios. All are significant at *prob.* < .01.

We use a slightly different model than in Table 2, but the results remain similar. Compared to white male drivers, Black males have 2.34 times the odds of search; Hispanic males, 1.53 times the odds. These odds go up when they are pulled over for a minor speeding violation, as before, and as before, faster speeding violations lead to lower likelihoods of search. (The baseline is being pulled over for a reason other than speeding.) Older cars lead to more search, moreso for whites than for minority drivers. Out of state plates again have a high coefficient: a 32 percent increased likelihood of search, and even more than that for Black drivers (slightly less for Hispanic drivers.)

Because the realities of policing appear to differ by race, we present in Table 4 three separate equations, one for Whites, one for Blacks, and one for Hispanics. The analysis is again restricted to males.

Table 4. Predictors of Search for White, Black, and Hispanic Male Drivers, Texas DPS, 2011-16.

| Predictor Variable | White | Black | Hispanic |
|----------------------------|-----------|-----------|-----------|
| Speeding < 10 | 1.35 | 1.22 | 0.93 |
| Speeding 10-14 | 0.53 | 0.61 | 0.45 |
| Speeding 15-19 | 0.57 | 0.60 | 0.51 |
| Speeding 20+ | 0.89 | 0.73 | 0.74 |
| Vehicle 6-10 years old | 1.73 | 1.11 | 1.55 |
| Vehicle 11-15 years old | 2.62 | 1.49 | 1.87 |
| Vehicle 16+ years old | 2.58 | 1.24 | 1.79 |
| Out of State Plates | 1.11 | 1.32 | 1.20 |
| Black Disparity Officer | 1.71 | 2.93 | 1.71 |
| Hispanic Disparity Officer | 1.24 | 1.19 | 2.37 |
| Hour of Day | included | included | included |
| Day of Week | included | included | included |
| N | 5,368,129 | 845,584 | 1,626,606 |
| Log likelihood | (493,183) | (139,580) | (191,128) |

Recall that the baseline to which the odds-ratios in Table 4 can be compared are male drivers stopped for a reason other than speeding. Since Hispanics are often stopped for other reasons, any speeding violation reduces the likelihood of search, even a minor speeding violation. For Whites and Blacks, being pulled over for a minor speeding violation is associated with a 35 or a 22 percent increased likelihood of being searched, and faster speeders, of all three racial / ethnic groups, are much less likely to be searched. Older cars generate higher likelihood of search, especially for White drivers. Out of state plates generate a 32 percent increased likelihood of search for Black male drivers, 20 percent for Hispanics, and 11 percent for Whites. Again, we include the “high disparity officer” variables in the model as an important control. The coefficients show, as one would expect, that Blacks and Hispanics stopped by a high disparity officer have much higher likelihoods of search. The other coefficients in the model should be understood as the remaining disparities, after this fact has been taken into account statistically.

Finally, we repeat the model from Table 4 limiting ourselves only to 2016.

Table 4. Predictors of Search for Black White and Hispanic Male Drivers, Texas DPS, 2016

| | White | Black | Hispanic |
|-------------------------|-------|-------|----------|
| Speeding < 10 | 1.69 | 1.49 | 1.13 |
| Speeding 10-14 | 0.54 | 0.70 | 0.52 |
| Speeding 15-19 | 0.56 | 0.66 | 0.52 |
| Speeding 20+ | 0.88 | 0.78 | 0.85 |
| Vehicle 6-10 years old | 1.52 | 1.12 | 1.41 |
| Vehicle 11-15 years old | 2.54 | 1.50 | 1.73 |
| Vehicle 16+ years old | 3.51 | 1.35 | 1.90 |
| Out of State Plates | 1.14 | 0.95 | 1.04 |
| Black Disparity Officer | 2.08 | 3.34 | 1.85 |

| | | | |
|----------------------------|----------|----------|----------|
| Hispanic Disparity Officer | 1.15 | 1.10 | 2.38 |
| Hour of Day | included | included | included |
| Day of Week | included | included | included |
| N | 566,626 | 122,592 | 489,777 |
| Log likelihood | (49,753) | (20,566) | (53,268) |

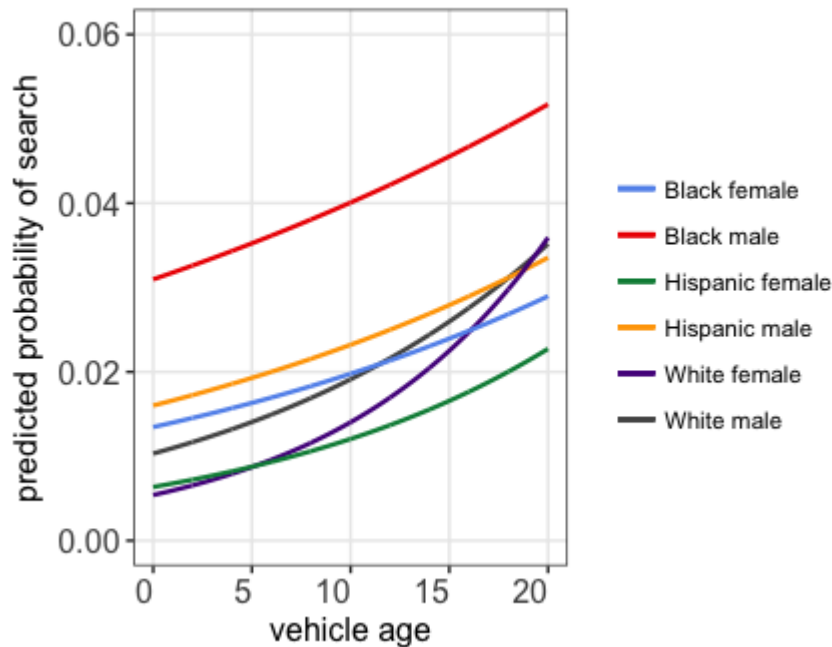
The overall rates of search in Texas DPS traffic stops are highly variable depending on the race and gender of the driver. In 2016, search rates were as follows:

Table 6. Search Rates by Race and Gender, 2016.

| Race and Gender | Number of Stops | Search Rate |
|-----------------|-----------------|-------------|
| White Male | 566,626 | 1.92 |
| Black Male | 122,592 | 4.20 |
| Hispanic Male | 489,777 | 2.38 |
| White Female | 320,888 | 1.16 |
| Black Female | 67,255 | 1.89 |
| Hispanic Female | 207,742 | 1.08 |

Based on a logistic regression similar to the one presented in Table 4, but including drivers of both genders, and focusing only on 2016 when the problems associated with coding the race of Hispanic drivers was corrected, we can estimate these likelihoods of search, based on the age of the vehicle.

Figure 1. Predicted Odds of Search, by Race and Gender, Texas DPS, 2016.



Black males start out with very high rates of search, and as they drive older cars this likelihood increases monotonically, reaching five percent when the car is 20 years old. Note that the odds of search for white drivers are low when the cars are newer, but these increase substantially when they drive cars more than 10 years old.