Researchers develop new statistical test that shows racial profiling in police traffic stops

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Stanford researchers have developed a new statistical measure of racial profiling in traffic stops, which they are applying to data collected from many states. Credit: Thomas Hawk / Creative Commons

By analyzing data from 4.5 million traffic stops in 100 North Carolina

cities, Stanford researchers have found that police in that state are more likely to search black and Hispanic motorists, using a lower threshold of suspicion, than when they stop white or Asian drivers.

The empirical study found that while blacks and Hispanics are more likely to be searched, those more numerous searches are less likely to uncover illegal drugs or weapons than searches of vehicles with white or Asian drivers.

Studies based on the incidence of searches by race, and the outcomes of those searches, have been done in the past, forming the basis for concerns about racial profiling by police.

But the Stanford team – graduate students Camelia Simoiu and Sam Corbett-Davies, and assistant professor of management science and engineering Sharad Goel – developed a third, entirely new measurement called a threshold test.

The researchers show that this new measure offers a statistically rigorous way to quantify how suspicious officers were to initiate a search. For example, did officers conduct searches when there was a 15 percent probability of finding weapons or drugs, or was a 5 percent inkling enough? They correlated these threshold assessments to the race or ethnicity of the subjects across the entire dataset of 4.5 million motor vehicle stops.

"Our threshold test suggests that officers apply a double standard when deciding whom to search, with black and Hispanic drivers searched on the basis of less evidence than whites and Asians," said Simoiu, adding, "We consistently observe this pattern of behavior across the largest 100 police departments in the state."

The study marks a new milestone in Stanford's Project on Law, Order

and Algorithms, which has already collected data on 50 million traffic stops in 11 states and is aiming to expand the database to 100 million stops from at least 30 states and every region of the Unites States. The purpose of the database, which the researchers plan to make publicly available, is to shed light on the prevalence of racial profiling and to identify techniques for improving police practices.

In the case of North Carolina, the researchers obtained records for traffic stops in the state from 2009 through 2014. The records included information about the ethnicity, age and gender of the people being pulled over and at least some information on the rationale of police officers for searching particular people and vehicles.

Racial differences

Until now, analysts have used two fairly simple statistical tests to look for patterns of racial profiling.

The first test, known as benchmarking, involves comparing search rates for people of different ethnicities. If blacks account for 10 percent of the local population but 30 percent of searches, that higher incidence would be evidence of discrimination. A second test examines the "hit" rate or outcome – the percentage of searches that actually lead to the discovery of weapons, drugs or other illegal contraband.

In North Carolina, both statistical tests provided strong evidence of unfounded racial discrimination. Police searched 5.4 percent of blacks and 4.1 percent of the Hispanics they pulled over, but only 3.1 percent of whites. In many cities and towns, however, searches of blacks and Hispanics were actually less likely to uncover contraband than searches of whites.

But even when both tests converge, this analysis has limitations. If a

higher percentage of people in one ethnic group actually do carry illegal drugs or weapons, for example, a higher search rate for that group may not reflect racial discrimination.

So the Stanford researchers went further than prior studies to get a more accurate view of the presence or absence of unfounded discrimination.

They did this by developing a complex statistical tool they call a threshold test. It analyzed four variables for each of the 4.5 million stops:

- Race of the driver
- Department of the officer making the stop
- Whether the stop resulted in a search – and, if a search occurred,
- Whether it turned up drugs, guns or other contraband

These four variables provided a statistical snapshot of an officer's threshold of suspicion before searching a person of a given race. As the authors wrote: "In nearly every one of the 100 departments we consider, we find that black and Hispanic drivers are subjected to a lower search threshold than whites, suggestive of widespread discrimination against these groups."

Specifically, the study found that police decided to search black drivers based on a 7 percent certainty that they might be hiding something illegal. If an African American driver looks nervous, for example, police might interpret the nervousness as a sign of possible guilt and insist on a search.

For Hispanics, the search threshold was 6 percent certainty. But police in these 100 North Carolina cities wanted a 15 percent certainty before searching the vehicles of white drivers. The threshold for searching Asians was about the same as for whites.

Suspicions and searches

The finding has important implications, the researchers noted.

Had North Carolina's police applied the same standard of suspicion to blacks as whites, the researchers estimate that they would have searched 30 percent fewer black drivers – about 30,000 people over the six years they study. Hispanics would have experienced a 50 percent reduction in searches affecting 8,000 drivers.

But while the new test reveals that the threshold of suspicion varies by race, the authors note a caveat.

"We cannot, however, definitively conclude that the disparities we see stem from racial bias," they wrote. "For example, officers might instead be applying lower search thresholds to those from lower socio-economic backgrounds, a demographic that is disproportionately black and Hispanic."

The Stanford researchers are collecting traffic stop data from other states to see what patterns are revealed by their analyses. They are also considering ways to apply their new statistical methods to other settings where race or ethnicity may be a factor, such as mortgage lending and hiring.

"We hope our results spur further investigation into allegations of police discrimination, and help improve public policy," Goel said.

Provided by Stanford University

profiling-police-traffic.html