

# Vehicle stop study illuminates importance of officer's first words

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Eugenia Rho believes in the importance of first impressions, especially during vehicle stops.

An assistant professor in the Department of Computer Science, Rho is the lead author of a new research paper that illustrates how a [law enforcement officer](#)'s first 45 words during a vehicle stop with a Black driver can often indicate how the stop will end.

"We found that there's a key difference in how officers talk to Black drivers during the first moments of stops that end in an arrest, handcuffing, or search versus those that don't end in such outcomes," said Rho, who leads the Society, AI, and Language (SAIL) research lab at Virginia Tech. "Simply put, the officer starts off with a command rather than a reason in escalated stops."

Published in the *Proceedings of the National Academy of Sciences*, the peer-reviewed research also found that Black men could often predict a stop's outcome simply by listening to those same 45 words, which generally spanned less than 30 seconds.

"There's a clear linguistic signature to escalated vehicle stops. It was discerned by trained coders, computational language models, and perhaps most importantly, by Black male citizens," Rho said.

Rho began this research as a postdoctoral researcher at Stanford University, working alongside Jennifer Eberhardt, a professor of organizational behavior and psychology, and Dan Jurafsky, a professor of computer science and linguistics.

The team, which also included researchers from the University of Michigan, analyzed [audio recordings](#) and transcripts from police-worn body cameras from 577 vehicle stops that occurred over the course of a month in a medium-sized, racially diverse city in the U.S. The data included stops that ended in arrest, handcuffing, or searches and those that did not, but did not include any stops in which force was used.

One reason the team decided to focus on Black drivers was they were disproportionately represented in the data, according to Rho.

"We limited the study to Black drivers because less than 1% of the escalated stops included non-Black drivers in our sample," Rho said.

"We included both male and female drivers, but escalated stops were predominately male drivers."

The data was used in two studies included in the paper, one focused on officer language used during a traffic stop's earliest moments and a second aimed at better understanding the perception of Black men when hearing those same words. A third section of the paper includes a case study that examines the first moment of the traffic stop involving George Floyd in May 2020.

## **Dissecting the dialog**

In the first study, researchers used computational linguistics and hand annotation to analyze the transcripts by identifying dialog acts, such as greeting, commands, questions, reasons, and more.

"Dialog acts are like conversation road maps," Rho said. "They show not only what the speaker is trying to do—like ask a question or give an order—but also how that piece of conversation fits into the larger discussion, helping to guide what might be said next."

When analyzing the findings, controls were set in place to account for factors that could impact the language used, such as the reason the driver was pulled over, the area's crime rate, and more.

"During vehicle stops, officers might ask for ID, explain why the driver was pulled over, or give a ticket. We were interested in how the balance of these dialog acts might differ between escalated and non-escalated

stops," Rho said.

The study found that the stops ending in escalation were almost three times more likely to begin with the officer issuing a command to the driver and 2 1/2 times less likely to provide a reason for the stop.

"We found that stops that end escalated, often start escalated," Rho said.

## **Evaluating the experience**

During the second study, researchers played the audio from the traffic stops in the first study to a nationally representative sample of 188 Black male U.S. citizens ranging in age, region, education, and political ideology. Each participant was asked to listen to 10 stops at random—five that ended in escalation and five that did not—from the perspective of the driver and were then surveyed about their feelings and predictions for the stop's outcome.

Black male participants appeared to use officer language as a guide to whether they believed the stop would end with the driver being handcuffed, searched, or arrested. They predicted that 84% of stops that involved an officer giving orders with no reasons would escalate. In addition, they worried about force being used in more than 80% of the stops that involved orders and no reasons as compared to only 47% of stops that involved reasons with no orders.

## **A present pattern in other stops?**

Having found escalated vehicle stops carry a unique "linguistic signature"—the officer gives an order without stating the reason for the stop—the researchers wanted to see if the same signature was present in stops that involve force. As a [case study](#), the team examined the initial

moments between Floyd and the officer who first approached him during the highly publicized encounter on May 25, 2020.

In less than 30 seconds of Floyd's interaction with the officer, the officer delivered 57 words across nine speech turns, made up only of physical orders. Floyd, in his 11 speech turns, extended apologies, sought reasons for the stop, declared innocence, expressed fear, and pleaded with the officer. Yet every dialog act from Floyd was met with a singular response from the officer: an order.

## **Better practices, better relations**

At a time when vehicle stops ending in the use of force often gain national attention, Rho said the team felt it important to better understand police-citizen interactions during more common vehicle stops.

"The most common way for the average citizen to encounter law enforcement is through vehicle stops," Rho said. "So we really wanted to better understand how we can improve communication between officers and citizens during those encounters."

While both studies reveal valuable insights, Rho said she hopes the observation is not where the reach of this paper ends.

"We want this study to really start conversations around how we can inform training around de-escalation practices for law enforcement and potentially a better understanding of how to facilitate relations between Black communities and law enforcement as well," Rho said.

**More information:** Rho, Eugenia H. et al, Escalated police stops of Black men are linguistically and psychologically distinct in their earliest moments, *Proceedings of the National Academy of Sciences* (2023). [DOI](#):

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