

Do passengers want self-driving cars to behave more or less human?

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The finalized prototype of Google self-driving car. Credit: Google

Recent studies have shown that people have negative attitudes about using autonomous systems because they don't trust them. Moreover, research shows a human-centered approach in autonomy is perceived as more trustworthy by users. This begs the question: "Do passengers want self-driving cars to mimic their personal driving behaviors or do they hold these autonomous vehicles to a different standard?"

To explore this quandary, researchers from Florida Atlantic University's College of Engineering and Computer Science conducted a study asking 352 participants about their personal driving behaviors such as speed, changing lanes, distance from a car in front of them, accelerating and decelerating and passing other vehicles. They also asked them the same questions about their expectations of a self-driving car performing these very same tasks. The objective of the study was to examine trust and distrust to see if there is a relationship between an individual's driving behaviors and how they expect a self-driving car to behave.

For the study, published in the proceedings *HCI in Mobility, Transport and Automotive Systems*, researchers asked the participants 46 questions to gain a better understanding of driving behavior and driver's expectations of self-driving cars in a variety of driving scenarios. Ultimately, information from this study can be used to construct driving models for self-driving cars.

Interestingly, results showed that most people prefer a self-driving car that drives like a less aggressive version of their own driving behaviors. Participants who reported that they trust or somewhat trust artificial intelligence, autonomous technologies, and self-driving cars expected a car with behaviors similar to their personal driving behaviors. Researchers also found that the expectation of a self-driving car's level of attenuated aggressiveness witnessed among all other participants was relative to their personal driving behavior aggressiveness. For example, male drivers showed to be more aggressive drivers than female drivers, and therefore, their expectations for a self-driving car was slightly more aggressive.

"We found that current attitudes toward [artificial intelligence](#), autonomous technologies, and self-driving cars had an effect on our participants' expectations of a self-driving car," said Mehrdad Nojournian, Ph.D., senior author, and an associate professor in the

Department of Electrical Engineering and Computer Science and director of the Privacy, Security and Trust in Autonomy Lab, who co-authored the paper with Jamie Craig, a [graduate student](#) and a graduate research assistant in the Department of Electrical Engineering and Computer Science. "The one group that stood out to us were those who trust or somewhat [trust](#) using AI, autonomous technologies, and self-driving cars. Their driving behavior aggressiveness scores and their [self-driving](#) aggressiveness scores were not significantly different, and they would want a car that matched their personal driving [behavior](#)."

The article recently received "Best Paper Award" from the "Third International Conference on HCI in Mobility, Transport and Automotive Systems," awarded to Nojournian and Craig, who presented the findings of the paper at the conference.

"The closer the automated vehicle dynamics are with those of a manually driven vehicle, the more likely that the comfort level of the automated vehicle user will improve," said Stella Batalama, Ph.D., dean, College of Engineering and Computer Science. "Results from this study can be considered by engineers, computer scientists and researchers and will be useful in developing certain profiles or settings for [self-driving cars](#) and overall can help in designing one that is perceived as trustworthy by passengers."

More information: Jamie Craig et al, Should Self-Driving Cars Mimic Human Driving Behaviors?, *HCI in Mobility, Transport, and Automotive Systems* (2021). [DOI: 10.1007/978-3-030-78358-7_14](https://doi.org/10.1007/978-3-030-78358-7_14)

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