

# IMPACT OF INFORMATION ON CONSUMER UNDERSTANDING OF A PARTIALLY AUTOMATED DRIVING SYSTEM

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## INTRODUCTION

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Partial driving automation technologies, also known as active driving assistance or Level 2 (L2), allow vehicles to perform some aspects of the driving task, such as maintaining speed, lane position, and distance from the vehicle ahead, without direct input from the driver. The safe use of these systems depends on the driver having an accurate understanding of the capabilities and limitations of the system. There is growing concern that marketing materials and other information provided by automobile manufacturers, the media, and other sources may lead consumers to develop unrealistic expectations of the extent to which a vehicle with such technology is capable of safely “driving by itself.” The purpose of this study was to explore how the information given to drivers about an active driving assistance system influences their initial beliefs about and expectations of the system, and by extension, how they interact with it.

For this study, 90 research participants received brief training about an active driving assistance system. Half of the participants received information that called the system “AutonoDrive” and emphasized the system’s capabilities and driver convenience; the other half received information that called the same system “DriveAssist” and emphasized the system’s limitations and driver responsibility. One-third of the participants received the information in the form of a printed booklet, one-third watched a video, and one-third received a brief in-person demonstration. The same information was provided to participants in all training conditions. Responses to survey questions and driving behaviors during a brief on-road drive in a vehicle equipped with the system were compared between participants assigned to the different training conditions.

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## KEY FINDINGS

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Questionnaire responses indicated that virtually all participants understood that they were still required to pay attention to the road while using the system. However, there was clear evidence that the branding approach that emphasized system capabilities and driver convenience (“AutonoDrive”) led to greater confidence — and in some cases overconfidence — in the system, relative to the branding approach that emphasized system limitations and driver responsibility (“DriveAssist”). For example, participants trained about AutonoDrive were significantly more likely to believe incorrectly that the system could detect and take action to avoid vehicles to its sides, even though all training materials explicitly stated that it could not.

These results were compounded by greater likelihood to report willingness to engage in potentially distracting or risky behaviors (e.g., talk on a cell phone) while using the system among participants who received the training that emphasized capabilities rather than limitations.



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## ABOUT

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Established in 1947 by AAA, the AAA Foundation for Traffic Safety is a nonprofit, publicly funded, 501(c)(3) charitable research and educational organization. The AAA Foundation’s mission is to prevent traffic deaths and injuries by conducting research into their causes and by educating the public about strategies to prevent crashes and reduce injuries when they do occur. This research is used to develop educational materials for drivers, pedestrians, bicyclists and other road users. Visit [www.AAAFoundation.org](http://www.AAAFoundation.org) for more information.

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When driving with the system engaged, participants who received the training that emphasized the system's capabilities displayed greater confidence in the system — as assessed by the proportion of time that they had their hands away from the steering wheel and feet away from the pedals — compared with those who received the training that emphasized limitations. These participants were also more likely to take a very long time (5+ seconds) to respond when the system disengaged unexpectedly and returned speed and steering control to the driver.

Answers to a post-drive questionnaire indicated participants tended to become more confident in the system after they drove with it. Moreover, many of the differences in understanding of and confidence in the system observed before the drive between participants trained about “AutonoDrive” versus “DriveAssist” persisted, and in some cases even increased, after driving the vehicle.

In summary, this study finds that consumer-oriented information emphasizing a partially automated driving system's capabilities, without commensurate emphasis given to limitations, can produce inflated expectations regarding what the system can do and the situations that it can handle. Results underscore the importance of providing consumer-oriented information that is not only technically accurate but also balanced, with appropriate emphasis given to the limitations of technology and the importance of driver engagement.

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## METHODOLOGY

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Researchers from Westat (Rockville, Maryland) recruited 90 licensed drivers from the Washington, D.C. metropolitan area with no prior experience driving a vehicle with a Level 2 partially automated driving system. The mean age of participants was 47 years (standard deviation 14 years) and 46% were male.

The vehicle used in the study was a 2018 Cadillac CT6 equipped with a [SAE Level 2](#) active driving assistance system named Super Cruise. All logos and branding information on the vehicle were removed or obscured. The study sought to investigate the effects of differences in the information given to participants. It was not an evaluation of the vehicle nor of Super Cruise.

The researchers developed a printed quick start guide, a short video, and protocol for an in-person demonstration to train the participants how to use the system (Super Cruise). In one version of the materials, the system was named “AutonoDrive” (to connote autonomous driving). These materials emphasized the system's capabilities and driver convenience. In the other version of the materials, the system was named “DriveAssist,” and the materials emphasized the system's limitations and the driver's responsibility for safe operation. Despite the differences in emphasis, neither version omitted any important safety information nor presented any false information.

For the study, researchers gave each participant one of the six training materials (quick start guide, video, or demonstration; about AutonoDrive or DriveAssist). After reviewing the material, participants completed a questionnaire about their understanding of the system, its capabilities and limitations, and their willingness to drive with versus without it under various scenarios. After completing the questionnaire, respondents drove the research vehicle approximately 31 miles on a divided, limited-access highway with a 60 mph speed limit (Maryland Route 200) with a researcher present in the front passenger seat to instruct participants, take notes, and ensure safety. Various driver behavior and performance data, such as the vehicle's speed and the position of the drivers' hands and feet, were recorded by cameras and sensors installed in the vehicle. After completing the drive, participants completed another questionnaire that asked many of the same questions as the previous questionnaire regarding their understanding of the system, as well as some questions about their overall impression of the system after having driven with it.

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## REFERENCE

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Singer, J. & Jenness, J.W. (2020). The Impact of Information on Consumer Understanding of A Partially Automated Driving System (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.