

# Up to 27 seconds of inattention after talking to your car or smartphone

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A University of Utah research assistant introduces a participant in new distracted driving studies to special devices designed to gauge mental distraction during road tests. Credit: AAA Foundation for Traffic Safety

If you think it is okay to talk to your car infotainment system or

smartphone while driving or even when stopped at a red light, think again. It takes up to 27 seconds to regain full attention after issuing voice commands, University of Utah researchers found in a pair of new studies for the AAA Foundation for Traffic Safety.

One of the studies showed that it is highly distracting to use hands-free [voice commands](#) to dial phone numbers, call contacts, change music and send texts with Microsoft Cortana, Apple Siri and Google Now smartphone personal assistants, though Google Now was a bit less distracting than the others.

The other study examined voice-dialing, voice-contact calling and music selection using in-vehicle information or "infotainment" systems in 10 model-year 2015 vehicles. Three were rated as moderately distracting, six as highly distracting and the system in the 2015 Mazda 6 as very highly distracting.

"Just because these systems are in the car doesn't mean it's a good idea to use them while you are driving," says University of Utah psychology professor David Strayer, senior author of the two new studies. "They are very distracting, very error prone and very frustrating to use. Far too many people are dying because of [distraction](#) on the roadway, and putting another source of distraction at the fingertips of drivers is not a good idea. It's better not to use them when you are driving."

The research also found that, contrary to what some may believe, practice with voice-recognition systems doesn't eliminate distraction. The studies also showed older drivers - those most likely to buy autos with infotainment systems - are much more distracted than younger drivers when giving voice commands.

But the most surprising finding was that a driver traveling only 25 mph continues to be distracted for up to 27 seconds after disconnecting from

highly distracting phone and car voice-command systems, and up to 15 seconds after disconnecting from the moderately distracting systems.

The 27 seconds means a driver traveling 25 mph would cover the length of three football fields before regaining full attention.

"Most people think, 'I hang up and I'm good to go,'" Strayer says. "But that's just not the case. We see it takes a surprisingly long time to come back to full attention. Even sending a short text message can cause almost another 30 seconds of impaired attention."

"The voice-command technology isn't ready," says Joel Cooper, a University of Utah research assistant professor of psychology and a co-author of the new studies. "It's in the cars and is billed as a safe alternative to manual interactions with your car, but the voice systems simply don't work well enough."

"Many of these systems have been put into cars with a voice-recognition system to control entertainment: Facebook, Twitter, Instagram, Snapchat, Facetime, etc. We now are trying to entertain the driver rather than keep the driver's attention on the road."

In 2013, 3,154 people died and 424,000 others were injured in motor vehicle crashes on U.S. roads involving [driver distraction](#), says the U.S. Department of Transportation.

The new AAA reports urge that voice activated, in-vehicle information systems "ought not to be used indiscriminately" while driving, and advise that "caution is warranted" in smart-phone use while driving.

The studies are fifth and sixth since 2013 by University of Utah psychologists and funded by the AAA Foundation for Traffic Safety. AAA formerly was known as the American Automobile Association.

Strayer and Cooper ran the studies with Utah psychology doctoral students Joanna Turrill, James Coleman and Rachel Hopman.



This graphic shows the mental distraction scores of three smartphone personal assistants and 10 in-vehicle infotainment systems for using voice commands in cars to call contacts, dial phone numbers or change music. The smartphone assistants' scores were 0.3 points higher than shown if a driver also sent text messages using them. Credit: AAA Foundation for Traffic Safety

**The ratings: In-car systems and smartphone assistants are distracting**

The previous Utah-AAA studies devised a five-point scale: 1 mild distraction, 2 moderate distraction, 3 high distraction, 4 very high distraction and 5 maximum distraction. Those studies showed cellphone calls were moderately distracting, with scores of 2.5 for hand-held calls

and 2.3 for hands-free calls. Listening to a book on tape rated mild distraction at 1.7. Listening to the radio rated 1.2.

One of the new studies found mild distraction for in-vehicle information systems in the Chevy Equinox with MyLink (2.4), Buick Lacrosse with IntelliLink (2.4) and Toyota 4Runner with Entune (2.9).

High distraction systems were the Ford Taurus with Sync MyFord Touch (3.1), Chevy Malibu with MyLink (3.4), Volkswagen Passat with Car-Net (3.5), Nissan Altima with Nissan Connect (3.7), Chrysler 200c with Uconnect (3.8) and Hyundai Sonata with Blue Link (3.8). The Mazda 6's Connect system rated very highly distracting (4.6).

In some cases, the same voice-command system (like Chevy MyLink) got different distraction scores in different models - something the researchers speculate is due to varying amounts of road noise and use of different in-vehicle microphones.

The second new study found all three major smartphone personal assistants either highly or very highly distracting. Two scores were given to each voice-based system: A lower number for using voice commands only to make calls or change music when driving - the same tasks done with the in-car systems - and a higher number that also included using smartphones to send texts by voice commands.

Google Now rated highly distracting (3.0, 3.3), as did Apple Siri (3.4, 3.7), while Microsoft Cortana rated highly to very highly distracting (3.8, 4.1).

Strayer says of both in-car information systems and smartphone personal assistants: "These systems are often very difficult to use, especially if you're just trying to entertain yourself. ... The vast majority of people we tested ended up being frustrated by the complexity and error-prone



nature of the systems."

## **How the studies were conducted**

The new studies were conducted with participants driving the various cars at 25 mph or less around a 2.7-mile route in Salt Lake City's Avenues neighborhood as they used voice-commands to dial numbers, call contacts and tune the radio using in-car systems, and to dial numbers, call contacts, choose music and text using smartphones.

With researchers in the car, the drivers were tested for the extent of their distraction, even as they kept their eyes on the road and hands on the wheel after hitting a voice-command system button. A head-mounted LED light flashed red every three to five seconds at the edge of a driver's left eye. Drivers pressed a switch attached to a thumb when they saw the light. The researchers measured how voice interactions with a car or smartphone reduced drivers' reaction times and accuracy at seeing the flashing lights. The drivers also completed surveys about their perceived level of distraction, and videos measured how much of the time they kept their eyes on the road, mirrors or dashboard.

The in-vehicle information system study included 257 people and the smartphone personal assistant study had 65 participants, all with no at-fault accidents during the past five years. Unlike the 2013 and 2014 studies, which included primarily people in their 20s, subjects in the new studies ranged in age from 21 to 70.

In the in-car information system study, the researchers did an initial test on the subjects, then let them take the cars home for five days to practice using the systems. Then they returned for reassessment of the mental workload from using the systems.

Strayer personally doesn't even make hands-free cellphone calls while

driving. He advises against using voice commands system while driving for purposes such as voice dialing, voice contact calling, surfing the Internet, sending email and text messages, reading email, tweeting or updating Facebook.

"If you are going to use these systems, use them to support the primary task of driving - like for navigation or to change the radio or temperature - and keep the interaction short."

Provided by University of Utah

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