



Traveler

THE MAGAZINE FOR AAA MEMBERS

NOVEMBER • DECEMBER 2014

Attractions remember
our veterans' bravery

FOR AAA MEMBERS ONLY!

Sprint



SAVE 10%
and get the 20GB
Sprint Family Share Pack
for \$90 a month
after discount.*

AAA.COM/SPRINTOFFER

See
other side.

Southern Landmarks
Beck the Halls

Soaking in beauty of
Turks and Caicos





DUMP THE Distractions

BY ROB BHATT

New research sheds further light on hands-free technology and the unseen distractions of driving.

When the dangers of using a cellphone, texting, and fiddling with devices while driving started becoming apparent about a decade ago, many people assumed that hands-free technology could offer a safe way to stay connected from behind the wheel. But a growing body of research is showing that such an assumption might, in some cases, be creating a false sense of security. In the most significant attempt to date to assess distractions caused by voice-controlled communication and navigation features in cars, test subjects using such systems showed measurable declines in their ability to drive safely. A few even crashed.

Fortunately, the collisions only occurred in a driving simulator—and only three times. But the fact that they happened at all helps illustrate the potentially dangerous levels of distraction that hands-free vehicle devices can cause, even as they allow motorists to keep their eyes on the road and their hands upon the wheel.

The University of Utah research team behind the study found that using hands-free, menu-based navigational systems or Apple's Siri while driving created higher levels of cognitive, or mental, distraction than conversing on a hands-free cellphone. With prior epidemiological studies showing that talking on a mobile phone—hand-

held or hands-free—while driving quadruples crash risks, the new findings are grabbing attention.

"The most significant takeaway is that this further confirms that cognitive distraction is real and that it has real consequences," says J. Peter Kissinger, president and CEO of the AAA Foundation for Traffic Safety, which sponsored the study. "The more we can get that message out, the better off we'll be."

INATTENTION BEHIND THE WHEEL

Compared to the volumes of data collected on how manual and visual distractions, such as texting and talking on handheld phones, affect drivers, Kissinger notes that relatively little research exists on the cognitive side of the equation. Yet scientists have known for years about inattention blindness, a phenomenon that can cause a person engaged in a mentally demanding task to fail to notice something happening right in front of him or her. As more and more voice-controlled devices appear in new cars, the Utah team's work is demonstrating how such devices can inadvertently cause a form of inattention blindness for motorists.

In a prior study completed in 2013, the same research group es-

established an index rating the levels of cognitive distraction created by various tasks people perform while driving. On a scale of 1 to 5, conversing on a hands-free mobile phone garnered a 2.3 rating, while using a handheld phone (illegal in 14 states and the District of Columbia) came in a touch higher at 2.5.

In the new study, completed over the summer, test subjects using a voice-controlled navigational system with perfect speech recognition while driving experienced a 2.8 level of distraction. The level rose to 3.6 when the navigational system produced speech-translation errors (common in systems in use today). Participants using Siri to check and compose text messages, update their Facebook or Twitter status, and review and modify calendar appointments experienced a 4.1-level distraction.

David Strayer, the University of Utah psychology professor who led the research team, believes that lapses that caused Siri to sometimes provide different answers to the same question are at least partially to blame for its high rating.

"When the study participants asked Siri to do the exact same thing [at different times], sometimes it would do it, and sometimes it wouldn't," he says. "We could never figure out why it got it sometimes and didn't others, but as soon as you have a system that doesn't have a high level of reliability, it becomes frustrating to use."

Strayer's team analyzed reactions demonstrated by volunteer test subjects in a driving simulator or while driving an instrumented Subaru Outback on suburban Salt Lake City roads (see the next page for research details). In the driving simulator, participants "rear-ended" a "car" they were following while using Siri (twice) and a menu-based navigational device (once). No collisions occurred on the public roads; the car used for the latter tests was equipped with a redundant braking system accessible to a passenger seated in the car for added safety.

On the less-distracting side, a system that allowed drivers to use simple voice commands to change a radio station or adjust an air conditioner registered a 1.9 rating. For comparison's sake, the 2013 study attached a 1.8 rating to listening to an audiobook.

In a companion study also completed over the summer, the researchers analyzed the use of voice-based radio-tuning and phone-dialing features available in cars offered by six manufacturers. Distraction levels ranged from 1.7 for such features available through Toyota's Entune system to 3.7 for those in Chevrolet's MyLink.

"If the car commands are done well, so that I can say, 'Change a radio station,' and it's not some cumbersome thing, it does not cause a problem," Strayer says. "So, the good news is, it can be done in a way that's not troublesome."

WHAT COMES NEXT?

In its efforts to make in-car devices safer, AAA is sharing the Strayer team's findings with the auto industry and government agencies such as the National Highway Traffic Safety Administration (NHTSA). The latter agency plans to issue voluntary guidelines in the next year or two to automakers, aftermarket suppliers, the wireless industry, and others on minimizing distractions created by future voice-controlled devices offered to motorists.

In the meantime, AAA's traffic-safety experts advise motorists to be aware that not all current hands-free vehicle devices are risk-free and to minimize the use of such features while driving. •

Rob Bhatt is the editor of Western Journey magazine, published by AAA Washington.



“If the car commands are done well, so that I can say, ‘Change a radio station,’ and it’s not some cumbersome thing, it does not cause a problem. So, the good news is, it can be done in a way that’s not troublesome.”

Dr. David Strayer
Professor, University of Utah

Know What's Behind the Numbers

BY ROB BHATT

How do you measure something that you can't see, feel, or hear? When it came to assessing how well drivers were paying attention to the road while using various hands-free devices, the University of Utah research team led by psychology professor David Strayer analyzed reaction times, brain activity, eye movements, and other factors linked by prior research to distracted driving.

In separate rounds of testing, Strayer's team asked volunteers (different groups of 40 to 45 people in each round) to stare at a fixed image on a computer screen, follow a lead vehicle in a driving simulator, or drive on suburban Salt Lake City streets in an instrumented Subaru Outback. Following internationally accepted standards for measuring reaction times, a small LED light mounted to a headband was placed above and off to the side of each participant's left eye. Participants also wore caps fitted with sensors to monitor brain waves associated with mental workload, while electrodes and cameras tracked their eye movements.

As each participant began performing the primary activity for his or her setting, the headband light would periodically flash green or red. The volunteers were asked to press a switch attached to their thumb when the light turned green, but not when it turned red.

As each round continued, they were asked to perform a number of secondary tasks with devices modeled after hands-free features available in cars. These included changing a radio station through



During the University of Utah study, while the participant drives, research equipment monitors reaction times and gathers data. © Dan Campbell/AAA 2014

simple voice commands; listening to text and email messages; listening to and composing replies to messages; operating a menu-based navigational system

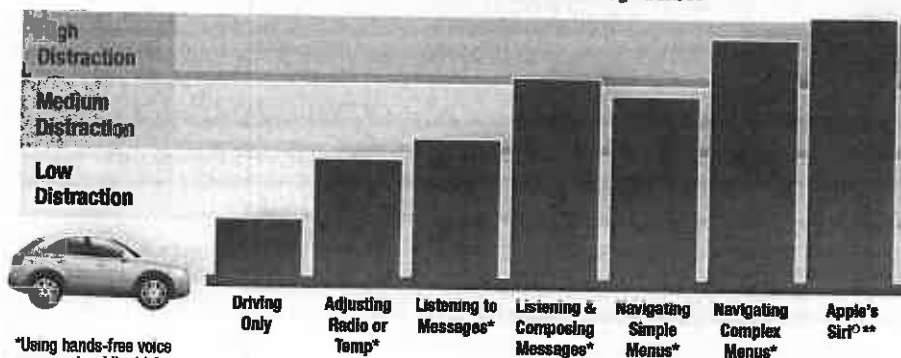
with perfect reliability and, separately, a system susceptible to speech-translation errors, and using Siri to listen to and compose messages, update their social media status, and review and modify calendar appointments.

Participants' reaction times were measured by how quickly and accurately they activated the switch in response to the lights. Sta-

tistical analyses of the reaction time, brain-wave, eye-movement, and other data allowed researchers to calculate the level of distraction caused by each secondary task. The cognitive-distraction ratings, shown below in the chart with those for previously analyzed activities, are based on a five-point linear scale that the same research group established in 2013. •

Rob Bhatt is the editor of Western Journey magazine, published by AAA Washington.

Mental Distraction Levels by Task



*Using hands-free voice commands while driving

**Version iOS7 at time of research

Evaluated sending/receiving texts, updating Facebook/Twitter and checking calendar by using voice commands while driving.