

PRESS RELEASE

September 23, 2014

A scientific study measures the effects of telephone conversations on driver attentiveness and perception

In the context of nearly one of two European drivers¹ using their phone while driving, VINCI Autoroutes Foundation for Responsible Driving is publishing the results of an unprecedented scientific study, conducted as part of its research program dedicated to preventing hypovigilance and drowsy driving. The research, conducted on motorways with 3,500 drivers under real conditions as well as via laboratory simulator, was performed by the University of Strasbourg's Center for Neurocognitive and Neurophysiological Investigation (Ci2N). The study measured the effects of telephone conversations on driver attention capacity, indicating deterioration in awareness of the road environment and an adverse effect on effective driving task performance.

- Information registered by the brain is decreased by 30%
- Visual exploration of the road environment are reduced by 50%
- Longer reaction times (+100 meters at 130 km/h)
- More random driving control in steering and when overtaking

Significant deterioration in awareness of the road environment

The experience conducted on the motorway network presented drivers with event images or objects (illuminated panels or tourism signs, stationary service vehicles, monuments ...) along the last 50 kilometers traveled and at "factitious events" not present on their route. Motorists were asked if they had - or had not - viewed these elements along their route.

The results show that subjects using their telephone while driving, with or without a hands-free kit², register 30% less information for all types of occurring events than drivers not using their telephone. This degradation of awareness of the road environment can reach 50% when the information requires more sustained attention, such as reading a message on a lighted sign.

The alteration of attention and memory capacity was even more significant when the driver was confronted with a "factitious event," which were believed to have been seen by 40% of drivers using their telephone compared with only 9% of motorists not on the phone.

Professor André Dufour, director of Ci2N and leader of the study, explains: "Asserting that a non-existent event was seen indicates a very vague perception of the road environment, resulting in a random encoding process in the brain."

Telephoning while driving poses significantly more risk than conversing with a passenger

Several indicators identified by the laboratory study enabled precise measurement of the degradation of attention and driving performance caused by a telephone conversation. Ocular activity, particularly horizontal eye

¹ European barometer on responsible driving IPSOS/VINCI Autoroutes Foundation - 2014

² No difference in test performance was observed between use of Bluetooth, ear buds, telephone loudspeaker or phone held to the ear.

movements, was significantly reduced (-50% compared to a conversation with a passenger or absent conversation). This major deficit in visual information explains the narrowing of vision observed in other studies³.

Telephone conversations also have an adverse and disruptive effect on the performance of basic driving tasks:

- **time spent in the passing lane** is significantly higher due to a lower average speed (-7km / h on average compared to when holding a conversation with a passenger and -15km / h compared to driving without conversation) and the driver returns less frequently to the travel lane (-50% compared to the control situation);
- **variation in the vehicle's trajectory**, which is strongly linked to lapses of attention caused by a distraction or decreased attentiveness, is higher (+ 20% compared to the conversation with a passenger or no conversation situations);
- **reaction capacity** is also significantly diminished; at 130km / h, the deceleration distance when an event occurs is lengthened by an average of 100 meters (+33%) compared to the no conversation situation and 70 meters (+23%) compared to the conversing with a passenger situation.

Finally, examination of the flow of the conversation shows that the latency between questions asked by a speaker and the driver's responses is significantly shorter (-12%) in a phone conversation, indicating that **the driver is more distracted by the conversation when the speaker is not with the driver in the vehicle** and does not share the vision of the road.

Simple reflexes to avoid danger

"The ubiquity of mobile phones in daily life is accompanied by a lack of self-regulation on the part of users, including in situations that may endanger them," said Bernadette Moreau, General Delegate of VINCI Autoroutes Foundation, which commissioned the study. *"The constant search to optimize one's time, including while traveling, leads many drivers to perform tasks that have nothing to do with or even disturb their driving. This is the case for telephone conversations regardless of whether they are made with or without a hands-free kit."*

Given the prevalence of this practice today, drivers should adopt a few simple reflexes:

- anticipate, organize better, stop: make calls before taking the road or during breaks; hand the call over to a third party, when possible;
- inform callers: before departing, activate a voice mail message informing callers that it is not possible to answer their call;
- protect drivers: when the person called is driving, systematically offer to call back;
- as a last resort, when a phone call is absolutely necessary: minimize its duration.

Methodology

Study under real conditions: perception of the road

The study was conducted at a service area of the A11 motorway between Paris and Chartres. The 3,500 drivers surveyed were asked to respond to an events recognition test (signs, monuments, vehicles) along the 50-kilometer section before the survey site. Possible responses include both real events along the respondents' route and scenes from another road (decoys). For each question, respondents were asked to indicate the degree of certainty of their response. Three subtests enabled memory skills to be assessed.

³ Inserm / Ifsttar collective expertise "Telephones and road safety" - 2011

Laboratory study: comparison of effects on alertness and driving behavior of a telephone conversation and a conversation with a passenger

Ninety-four subjects participated in this study, conducted on a driving simulator. They were divided into three groups of 30 drivers, differentiated according to age (20-30, 40-50 and over 60). Each group consisted of equal numbers of women and men. Participants were asked to make a 30-kilometer highway journey. Four scenarios provided reasons for drivers to adjust their speed based on events along their route (approaching a toll, bus accident in the left lane, construction area in the right lane, presence of radar). During the journey, the subjects were asked to converse with the test examiner, either by telephone or directly in the cockpit of the driving simulator. In a third driving session (baseline), participants had no verbal exchange throughout the journey.

About the VINCI Autoroutes Foundation for Responsible Driving

Established in February 2011, the VINCI Autoroutes Foundation for Responsible Driving is a laboratory, an observatory and an information source dedicated to the fight against road hazards. It seeks to contribute to changing behavior on the road and to help drivers be responsible for their own safety. Among its actions: conducting information campaigns to raise awareness of road hazards; funding innovative scientific research in fields regarding driving risks that remain insufficiently explored or understood by road users; financing association and citizen initiatives for responsible driving. <http://fondation.vinci-autoroutes.com>

About the Center for Neurocognitive and Neurophysiological Investigation of the University of Strasbourg (Ci2N)

The Ci2N, directed by Professor André Dufour, is a laboratory under the auspices of the University of Strasbourg and the CNRS. Research is broadly focused on human cognition and, more specifically, on the mechanisms of perception, memory and attention. Laboratory researchers leverage more than 20 years of experience in the development of experimental protocols and knowledge of the functioning of the human brain to propose studies and innovative applications in the field of automotive driving and road safety. www.ci2n.fr

Media contacts:

Estelle Ferron- estelle.ferron@vinci-autoroutes.com +33 6 34 99 33 61

Daniel Raphael - raphael.daniel@vae-solis.com +33 6 29 94 54 86

VINCI Autoroutes Foundation for Responsible Driving
12 rue Louis Blériot - 92506 Rueil-Malmaison Cedex, France

Fondation d'entreprise VINCI Autoroutes pour une conduite responsable
12 rue Louis Blériot - 92506 Rueil-Malmaison Cedex