

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Selected References on Distracted Driving
2005 - 2009

This document represents research conducted by experts globally and located through TRIS. The abstracts represent research on distractions both inside and outside the vehicle. This compilation is intended to demonstrate the breath of research published in the past five years in this subject. TRIS, the Transportation Research Information Services, is the world's largest bibliographic resource on transportation research information.

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| Distractions Outside the Vehicle | 49 |

◆ indicates a project was funded with U.S. DOT funds either directly or through a State DOT using SPR funds.

Distractions Inside the Vehicle

Title: Risky Behavior: Cell Phone Use While Driving

Abstract: In this experiment the authors investigated the percentage of drivers who use cell phones while driving in a small city in central New York. It was expected that the rates of cell phone use would be comparable to national levels, and that the percentage of cell phone use would be higher as the distance from the police station increased. Observations were taken of vehicles and drivers at 3 locations and on 2 different days of the week. One location was adjacent to the police station whereas the others were located 1 and 1-1/2 miles from the police station. While the overall results were consistent with other estimates of national rates of cell phone use while driving, the differences found between the rates at the police station and at remote locations were negligible.

Pagination: pp 221-229

Authors: Orłowski, Lori L; Luyben, Paul D

Publication Date: 2009/07

Serial: Journal of Prevention & Intervention in the Community
Volume: 37
Issue Number: 3
Publisher: Routledge
ISSN: 1085-2352

Index Terms: Accident causes; Accident factors; Accident responsibility; Automobile drivers; Automobile driving; Cell phones; Cellular telephones; Distracted drivers; Distraction; New York (State); State of New York; Traffic safety

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: Driver-Eye-Movement-Based Investigation for Improving Work-Zone Safety ♦

Full Text URL: <http://www.netc.umassd.edu/netcr71.pdf>

Abstract: Crashes continue to be a problem in work zones. Analyses have indicated that rear-end and sideswipe crashes are the most frequent. Investigators have hypothesized that distractions are often the cause of both types of crashes. These distractions will only increase as more and more drivers attend to other tasks, such as cell phone conversations. Three experiments were run to determine whether cell phone use in work zones increased drivers' inattention to the forward roadway. In Experiment 1, drivers were asked to navigate a virtual roadway on a driving simulator which contained a number of work zones. In Experiment 2, drivers were asked to navigate a test track in a real car which contained an actual work zone. And in Experiment 3, drivers were again asked to navigate a virtual roadway with signs warning drivers not to use their cell phones in the work zone. In all experiments, the drivers were asked to engage in a mock cell phone conversation for some portion of the trials. And in all experiments, the drivers' eyes were tracked. Cell phones clearly decreased drivers' ability to respond to events around them as determined both by vehicle and eye behavior. And warning signs were effective at increasing drivers' attention to the roadway.

Pagination: 61p

Authors: Fisher, Donald L; Knodler, Michael; Muttart, Jeffrey W

Corporate Authors: University of Massachusetts, Amherst
New England Transportation Consortium
Federal Highway Administration

Publication Date: 2009/01/28

Index Terms: Attention; Cell phones; Cellular telephones; Countermeasures; Distraction; Drivers; Eye movements; Motor vehicle operators; Utilization; Warning signs; Work zone safety

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|--|
| Title: | Does making a conversation asynchronous reduce the negative impact of phone call on driving? |
| Full Text URL: | http://www.sciencedirect.com/science/a...FJG-1/2/24cfa95da9c1de96880e6965f930df79 |
| Abstract: | Mobile phone use at the wheel has a proven negative impact on driving. This paper aims to assess whether using an answerphone instead of a normal phone reduces this negative impact. The answerphone makes communication asynchronous and splits it into three disconnected and successive phases: interaction with the voice interface, listening to the message and answering, which have been evaluated separately. The experiment was conducted on a fixed base simulator, with 30 participants (half male and female, aged from 18 to 50 years, driving at least 5000 km per year). The results show better scores for correct responses to stimuli for answerphone communications than for phone communications, although response times were higher in both communication conditions than in the driving alone condition. When the three phases of answerphone use were compared, interacting with the answerphone and listening to the message were found to be significantly less disturbing than answering, in terms of correct responses and response times. By making the conversation asynchronous, the answerphone avoids direct interaction between driver and caller. The fact that communication is under the driver's control allows him/her to pace the interaction better. Lastly, splitting up the conversation into different phases decreases the overall task difficulty. |
| Pagination: | pp 12-20 |
| Authors: | Bruyas, Marie-Pierre; Brusque, Corinne; Debailleux, Sandrine; Duraz, Max; Aillerie, Isabelle |
| Publication Date: | 2009/01 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 12 Issue Number: 1 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Answering machines; Asynchronous communication systems; Attention; Automobile driving simulators; Distraction; Driving; Driving simulators; Mobile communication systems; Motor vehicle handling; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Safety and Human Factors |

| | |
|--------------------------|--|
| Title: | Results of a field study on a driver distraction warning system |
| Full Text URL: | http://www.vti.se/EPiBrowser/Publikationer%20-%20English/R639A.pdf |
| Abstract: | <p>The main goal of the distraction and drowsiness field study was to evaluate a system for detecting driver distraction and drowsiness. This report focuses on the results of the study, indicating how a distraction warning system influenced glance behaviour. A vehicle was instrumented with an automatic eye tracker and other sensors. Seven participants drove the vehicle during one month each. During the first ten days a baseline was collected. Afterwards the warnings were activated, which involved that the drivers received a vibration in the seat when the algorithm determined that they had looked away from the forward roadway for a too long time. The main finding was that the drivers' gaze behaviour was not influenced much by the distraction warnings. The drivers received distraction warnings at about the same frequency during the treatment and the baseline phase. Performance indicators like "percent road centre" and others did not change from baseline to treatment phase. The average percentage of very long glances decreased slightly in the treatment phase, suggesting that the warning had an effect on the more extreme glance behaviour. There are also indications that the system helped prevent further extended glances away from the road immediately after a warning was issued.</p> |
| Pagination: | 96 |
| Authors: | Kircher, Katja; Kircher, Albert; Ahlström, Christer |
| Publication Date: | 2009 |
| Serial: | VTI. VTI rapport 639A |
| Index Terms: | Analysis; Data acquisition; Data collection; Data processing; Detection and identification; Distraction; Drivers; Driving; Drowsiness; Eye movements; Fatigue (Biology); Fatigue (Physiological condition); Field tests; In situ tests; Information processing; Motor vehicle handling; Motor vehicle operators; Primary detectors; Recording; Sensors; Test methods; Test procedures; Tests; Vehicle handling; Vehicle navigation; Warning systems |
| Subject Areas: | Safety and Human Factors |

Title: **The influence of Driver Distractions on the Likelihood of Rear-End, Angular, and Single-Vehicle Crashes in Missouri**

Source: Transportation Research Board Annual Meeting 2009 Paper #09-3397

Abstract: Driver distraction has been associated with a higher likelihood of crash involvement. Using crash data from the state of Missouri for the years 2001 to 2006, the highest number of distraction-related crash incidents occurred while using cell phones, having passengers in the car, and operating other electronic devices. A multinomial logit model was used to predict the odds that a driver with a specific type of distraction will be involved in one of the most frequent crash types: rear-end, angular, or single-vehicle collision in comparison to each other. Results of this study showed that distractions can have varying influences on crash type. More specifically, passenger-related and cell phone distractions are more likely in angular crashes, whereas for other electronic device-related distractions the most probable type of crash is a single-vehicle crash. Inferences made in this study should be considered in light of the fact that the data was limited in the number of reported distractions, and was conducted only from one state. Future research comparing similar distraction factors across other states and nationally may provide a broader view on the impact to the type and severity of crashes.

Pagination: 19p

Authors: Ghazizadeh, Mahtab; Boyle, Linda Ng

Corporate Authors: Transportation Research Board

Publication Date: 2009

Conference: Transportation Research Board 88th Annual Meeting

Index Terms: Accident data; Accident severity; Automobile drivers; Cell phones; Cellular telephones; Distraction; Missouri; Public safety; Rear end collisions; Safety; Safety measures; Single vehicle accidents

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|--|
| Title: | Effects of cognitive load presence and duration on driver eye movements and event detection performance |
| Record URL: | http://www.sciencedirect.com/science/a...56J-1/2/1cedda9315338550eb7323f7f649d780 |
| Abstract: | <p>This study examined the effects of cognitive load on driving performance for interactions with an in-vehicle information system (IVIS) that varied in duration from 1 to 4 min. Twelve participants drove in a simulator while intermittently performing the IVIS task. There were three IVIS conditions: interacting with the IVIS, non-IVIS periods between IVIS interactions, and baseline driving without the IVIS task. Contrary to our hypothesis, driver response to lead vehicle braking was surprisingly uniform across IVIS conditions. IVIS interaction did undermine driver ability to detect the bicyclist along the side of the road, and some of these performance decrements persisted after the IVIS interaction had ended. Reaction time for bicyclist detection increased from the first to the subsequent minutes of the interaction. Eye movements were influenced by the IVIS conditions but not by task duration. Both analysis of variance and factor analyses revealed that some of the changes in eye movements were concurrent with IVIS interaction while others persisted after the driver completed the IVIS interaction. Overall, the findings suggest that two mechanisms might account for the distraction-related performance decrements in this study: competition for processing resources and interference due to activation of competing goals.</p> |
| Pagination: | pp 391-402 |
| Authors: | Reyes, Michelle L; Lee, John D |
| Publication Date: | 2008/11 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 11 Issue Number: 6 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Analysis of variance; Automobile driving simulators; Cognition; Distraction; Driver communications; Driver information systems; Drivers; Driving simulators; Eye movements; Factor analysis; Highway communications; In vehicle advisory; In vehicle communications; Motor vehicle operators; Reaction time; Traffic information systems; Variance analysis |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: The influence of driver distraction on the severity of injuries sustained by teenage drivers and their passengers

Full Text URL: <http://www.sciencedirect.com/science/a...9V0-1/2/bda6f94fcfbb132fc24afc06414278f8>

Abstract: Studies show that teenage drivers are at a higher risk for crashes. Opportunities to engage in technology and non-technology based distractions appear to be a particular concern among this age group. An ordered logit model was developed to predict the likelihood of a severe injury for these drivers and their passenger using a national crash database (the 2003, U.S. DOT-General Estimate System). As one would expect, speeding substantially increases the likelihood of severe injuries for teenage drivers and their passengers. The results of the analysis also reveal that teenage drivers have an increased likelihood of more severe injuries if distracted by a cell phone or by passengers than if the source of distraction was related to in-vehicle devices or if the driver was inattentive. Additionally, passengers of teenage drivers are more likely to sustain severe injuries when their driver is distracted by devices or passengers than with a non-distracted or inattentive driver. This supports the previous literature on teenage drivers and extends our understanding of injuries for this age group related to distraction-related crashes.

Pagination: pp 254-259

Authors: Neyens, David M; Boyle, Linda Ng

Publication Date: 2008

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 1
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Attention lapses; Cell phones; Cellular telephones; Distraction; Injury severity; Juvenile automobile drivers; Logit models; Logits; Passengers; Teenage drivers

Subject Areas: Highways; Passenger Transportation; Safety and Human Factors; I83: Accidents and the Human Factor; I84: Personal Injuries

| | |
|--------------------------|--|
| Title: | Event-related potentials and secondary task performance during simulated driving |
| Full Text URL: | http://www.sciencedirect.com/science/article/pii/S0001457508000145 |
| Abstract: | <p>Inattention and distraction account for a substantial number of traffic accidents. Therefore, we examined the impact of secondary task performance (an auditory oddball task) on a primary driving task (lane keeping). Twenty healthy participants performed two 20-min tests in the Divided Attention Steering Simulator (DASS). The visual secondary task of the DASS was replaced by an auditory oddball task to allow recording of brain activity. The driving task and the secondary (distracting) oddball task were presented in isolation and simultaneously, to assess their mutual interference. In addition to performance measures (lane keeping in the primary driving task and reaction speed in the secondary oddball task), brain activity, i.e. event-related potentials (ERPs), was recorded. Performance parameters on the driving test and the secondary oddball task did not differ between performance in isolation and simultaneous performance. However, when both tasks were performed simultaneously, reaction time variability increased in the secondary oddball task. Analysis of brain activity indicated that ERP amplitude (P3a amplitude) related to the secondary task, was significantly reduced when the task was performed simultaneously with the driving test. This study shows that when performing a simple secondary task during driving, performance of the driving task and this secondary task are both unaffected. However, analysis of brain activity shows reduced cortical processing of irrelevant, potentially distracting stimuli from the secondary task during driving.</p> |
| Pagination: | pp 1-7 |
| Authors: | Wester, A E; Bocker, K B E; Volkerts, E R; Verster, J C; Kenemans, J L |
| Publication Date: | 2008/01 |
| Serial: | Accident Analysis & Prevention Volume: 40 Issue Number: 1 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575 |
| Index Terms: | Attention; Automatic steering control; Automobile driving simulators; Brain; Distraction; Drivers; Driving; Driving simulators; Lateral control; Lateral guidance; Motor vehicle handling; Motor vehicle operators; Steer by wire; Task demands; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: Passenger distractions among adolescent drivers

Full Text URL: <http://www.sciencedirect.com/science/a...G4P-1/2/db0e970c3a3c9e58f0f39c59a4c4b6e5>

Abstract: Adolescents who drive with peers are known to have a higher risk of crashes. While passengers may distract drivers, little is known about the circumstances of these distractions among teen drivers. This study used survey data on driving among 2,144 California high school seniors to examine distractions caused by passengers. Overall, 38.4% of youths who drove reported having been distracted by a passenger. Distractions were more commonly reported among girls and students attending moderate- to high-income schools. Talking or yelling was the most commonly reported type of distraction. About 7.5% of distractions reported were deliberate, such as hitting or tickling the driver or attempting to use the vehicle's controls. Driving after alcohol use and having had a crash as a driver were both significant predictors of reporting passenger-related distraction. Adolescents often experience distractions related to passengers, and in some cases these distractions are intentional. These results provide information about teenage drivers who are distracted by passenger behaviors. In some cases, passengers attempted to use vehicle controls; however, it seems unlikely that this behavior is common enough to warrant redesign of controls to make them less accessible to passengers.

Pagination: pp 437-443

Authors: Heck, Katherine E; Carlos, Ramona M

Publication Date: 2008

Serial: Journal of Safety Research
Volume: 39
Issue Number: 4
Publisher: Elsevier
ISSN: 0022-4375
OCLC: 1800052
Serial URL: <http://www.sciencedirect.com/science/journal/00224375>

Index Terms: Behavior; Behaviour; California; Distraction; Human behavior; Juvenile automobile drivers; Passengers; Surveys; Teenage drivers

Subject Areas: Highways; Passenger Transportation; Safety and Human Factors; I83: Accidents and the Human Factor

Title: The contribution of passengers versus mobile phone use to motor vehicle crashes resulting in hospital attendance by the driver

Full Text URL: <http://www.sciencedirect.com/science/a...YRJ-1/2/57f8db32210b10edfd2022ceb037e96b>

Full Text URL: <http://dx.doi.org/10.1016/j.aap.2007.03.004>

Abstract: There is evidence that mobile phone use while driving (including hands-free) is associated with motor vehicle crashes. However, whether the effects of mobile phone use differ from that of passengers in the vehicle remains unclear. The aim of this research was to estimate the risk of crash associated with passenger carriage and compare that with mobile phone use. A case-control study ('passenger study') was performed in Perth, Western Australia in 2003 and 2004. Cases were 274 drivers who attended hospital following a motor vehicle crash and controls were 1096 drivers (1:4 matching) recruited at service stations matched to the location and time and day of week of the crash. The results were compared with those of a case-crossover study ('mobile phone study') undertaken concurrently (n = 456); 152 cases were common to both studies. Passenger carriage increased the likelihood of a crash (adjusted odds ratio (adj. OR), 95% confidence interval (95% CI), 1.6, 1.1-2.2). Drivers carrying two or more passengers were twice as likely to crash as unaccompanied drivers (adj. OR 2.2, 95% CI 1.3-3.8). By comparison, driver's use of a mobile phone within 5 min before a crash was associated with a fourfold increased likelihood of crashing (OR 4.1, 95% CI 2.2-7.7). Passenger carriage and increasing numbers of passengers are associated with an increased likelihood of crash, though not to the same extent as mobile phone use. Further research is needed to investigate the factors underlying the increased risks.

Pagination: pp 1170-1176

Authors: McEvoy, Suzanne P; Stevenson, Mark R; Woodward, Mark

Publication Date: 2007/11

Serial: Accident Analysis & Prevention
Volume: 39
Issue Number: 6
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Accident causes; Accident factors; Accident responsibility; Case-control studies; Crossover studies; Distraction; Drivers; Highway accidents; Mobile telephones; Motor vehicle operators; Occupants; Passengers; Perth (Australia); Traffic accident victims; Traffic accidents; Vehicle occupants

Subject Areas: Highways; Passenger Transportation; Safety and Human Factors; I83: Accidents and the Human Factor

Title: **An Exploratory Survey of In-Vehicle Music Listening**

Abstract: This article reports on an exploratory survey of the impact of in-vehicle music listening on the driver's mood. The authors note that previous research suggests that music is a source of distraction and can influence driver mood, with subsequent effects on driving behavior. They conducted a survey to discover the extent to which people listen to music while driving, what they are listening to and why, and whether there is any association with driving safety. They used the presence of four or more years' no-claims on motor insurance as their measure. The results from the study of 1,780 British drivers reveals that approximately two-thirds listen to recorded music and music radio while driving, with music reported to be less distracting than conversation. The most commonly cited reasons for listening to music while driving were its benefits for relaxation and concentration. The survey found an association between possession of 'no claims' on motor insurance and a preference for silence. However, the genre of music playing also appears to influence driving performance: there is an association between possession of no-claims, genre of music, and a difference in the loudness at which certain genres were playing at the time of the last accident, relative to the expected norm for that genre. The authors conclude that their findings provide additional evidence for music as a source of in-vehicle distraction, which can have both positive and negative effects on driving performance.

Pagination: pp 571-589

Authors: Dibben, Nicola; Williamson, Victoria J

Publication Date: 2007/10

Serial: Psychology of Music
Volume: 35
Issue Number: 4
Publisher: Sage Publications, Incorporated
ISSN: 0305-7356
EISSN: 1741-3087

Index Terms: Attention; Attention lapses; Automobile drivers; Automobile driving; Distraction; Driving; Emotions; England; Habits; Insurance claims; Motor vehicle handling; Music; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|---|
| Title: | Imperfect in-vehicle collision avoidance warning systems can aid distracted drivers |
| Full Text URL: | http://www.sciencedirect.com/science/a...HJY-1/2/a854c31163136acd4916a32a2d009a20 |
| Abstract: | <p>The purpose of this study was to evaluate the efficacy of a type of in-vehicle collision avoidance warning system under conditions of driver distraction. Forty-three participants responded to an imperfect warning system while simultaneously driving a simulator and performing a visual/cognitive task. The major concerns were whether drivers would be more inclined to rely on such a system when they are distracted by subsidiary tasks, and if this reliance would be counterproductive. We found that distracted drivers responded, by increasing their temporal headway, to the less reliable system's alarms, but the warning system at the higher reliability levels led to over reliance and ultimately to maintaining shorter headways. This study has practical implications for the use of warning systems as driving aids for drivers. Although aids may be helpful and, in many cases, the more reliable aid is preferable, in the case of distraction, drivers may misuse the aid.</p> |
| Pagination: | pp 345-357 |
| Authors: | Maltz, Masha; Shinar, David |
| Publication Date: | 2007/07 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 10 Issue Number: 4 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Automobile driving simulators; Behavior; Behaviour; Collision avoidance systems; Distraction; Drivers; Driving; Driving simulators; Headways; Human behavior; Motor vehicle handling; Motor vehicle operators; Traffic safety; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Safety and Human Factors; Vehicles and Equipment; I83: Accidents and the Human Factor; I91: Vehicle Design and Safety |

Title: **First She Sneezed And the Next Thing She Knew, A Mailbox Was Looming Straight Ahead: New Institute Study Looks at How and Why Beginning Drivers Get Into Crashes**

Full Text URL: <http://www.iihs.org/sr/pdfs/sr4201.pdf>

Abstract: This article describes a new study that examines the reasons why new drivers are highly accident prone even compared with other accident prone groups. Of accidents these beginning drivers are involved in, they are at fault 68 percent of the time with 95 percent of crashes being single-vehicle crashes. 39 percent of beginner crashes are from running off the road and 31 percent of the crashes involved the beginning driver rear-ending another driver. Most of these accidents, the article explains, are from lack of attentiveness on the part of the drivers, with distractions including various media as compact disc players, radios, and cellular telephones as well as friends in the vehicle. The article also explains types of accident proneness based on gender, with males being more statistically likely to be involved in crashes due to loss of control and females being more likely to rear-end.

Pagination: p 5

Publication Date: 2007/01/27

Serial: Status Report
Volume: 42
Issue Number: 1
Publisher: Insurance Institute for Highway Safety
ISSN: 0018-988X

Index Terms: Accident prone drivers; Adolescents; Automobile driving; Collisions; Crashes; Distraction; Highway accidents; Juvenile automobile drivers; Teenage drivers; Teenagers; Traffic accidents; Youths

Subject Areas: Highways; Safety and Human Factors; I80: Accident Studies; I82: Accidents and Transport Infrastructure

| | |
|---------------------------|---|
| Title: | Multisensory Signal Detection: How Does Driving and IVIS Management Affect Performance? |
| Abstract: | Signal detection was used as a 'tertiary' task to assess drivers' 'spare processing capacity' during the performance of two in-vehicle information systems (IVIS). The main aims of the study were: a) to establish if performance on signal detection can be used to assess IVIS safety during driving and b) to determine whether signal modality is important for this assessment. Participants performed each IVIS (Phone or Count) during a driving simulation experiment. In addition to performing the driving and IVIS, participants were required to complete three detection tasks (DT): (i) a visual DT (ii) an auditory DT, and (iii) a tactile DT. Average reaction time to the DTs was found to increase by around 200ms when performed with the IVIS tasks. It can be argued that any significant increase in reaction time to the DTs is a good indicator of drivers' reduced hazard perception/situation awareness, which might occur as a result of using in-car systems. No significant difference in performance was found between the various DTs, suggesting that performance relies on central attentional resources, and is not modality-specific. This affords some flexibility for assessing the safety of IVIS in different driving environments. For instance, an auditory DT might be used in field studies on a sunny day when bright light hinders detection of LEDs used in a visual version of the task. Similarly, the tactile version of the task might be useful for testing IVIS in a noisy driving environment. |
| Pagination: | pp 351-357 |
| Authors: | Merat, Natasha; Jamson, A Hamish |
| Corporate Authors: | University of Iowa, Iowa City |
| ISBN: | 9780874141580 |
| Publication Date: | 2007 |
| Conference: | Driving Assessment 2007: 4th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design |
| Index Terms: | Attention; Auditory tasks; Automobile driving simulators; Awareness; Danger; Distraction; Driver communications; Driver information systems; Drivers; Driving; Driving simulators; Haptic; Hazards; Highway communications; Highway safety; Human information processing; In vehicle advisory; In vehicle communications; Motor vehicle handling; Motor vehicle operators; Multisensory signals; Perception; Performance; Reaction time; Road safety; Signal detection; Tactile perception; Touch; Traffic information systems; Traffic safety; Utilization; Vehicle handling; Vehicle navigation; Visual tasks |
| Subject Areas: | Highways; Research; Safety and Human Factors; I83: Accidents and the Human Factor |

| | |
|--------------------------|---|
| Title: | Driver Distraction in Long-Haul Truck Drivers |
| Full Text URL: | http://www.sciencedirect.com/science/a...GPS-1/1/c673f8c673ed04d6496a0134e61e6420 |
| Abstract: | <p>Research on driver distraction has typically been conducted by means of epidemiology or experimental testing. The study presented here uses a naturalistic approach, where real-world driving data were collected from truck drivers as they worked their normal delivery runs. Crash, near-crash, and crash-relevant conflict data from 41 long-haul truck drivers, driving approximately 140,000 miles, were examined. Of the 2737 crashes, near-crashes, and crash-relevant conflicts (collectively termed “critical incidents”) that were recorded, 178 were attributed to “driver distraction”. The 178 distraction-related critical incidents were analyzed and 34 unique distraction types were identified. Results showed that a small number of long-haul drivers were involved in a disproportionate number of distraction-related critical incidents. For example, two of the drivers accounted for 43 of the 178 distraction incidents. Important insight was also gained into the relative safety impacts of different distracting agents and behaviors. The frequency and duration of a task, along with the visual demand associated with performing the task, were found to contribute in combination to the prevalence of critical incidents. Finally, it was found that simply because a task does not necessarily require visual attention does not mean that long-haul drivers will not look (sometimes often) away from the roadway. However, it is also clear that visually demanding tasks carry the highest degree of risk, relative to other categories of tasks.</p> |
| Pagination: | pp 441-458 |
| Authors: | Hanowski, Richard J; Perez, Miguel A; Dingus, Thomas A |
| Publication Date: | 2005/11 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 8 Issue Number: 6 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Accident frequency; Accident rates; Distraction; Highway accidents; Human factors in accidents; Naturalistic studies; Task analysis; Traffic accidents; Traffic incidents; Truck drivers |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: Is a hands-free phone safer than a handheld phone?

Full Text URL: <http://www.sciencedirect.com/science/a...42Y-1/2/63800dccb2006e0dc817f98b58a19e55>

Abstract: Although it is becoming more and more accepted that driving while talking on a cell phone can be hazardous, most jurisdictions are making handheld phone use illegal while allowing hands-free phone use. The scientific literature exploring the effects of these two types of cell phone use on driving and driving-related performance is reviewed here. Our review shows that talking on the phone, regardless of phone type, has negative impacts on performance especially in detecting and identifying events. Performance while using a hands-free phone was rarely found to be better than when using a handheld phone. Some studies found that drivers compensate for the deleterious effects of cell phone use when using a handheld phone but neglect to do so when using a hands-free phone. Current research does not support the decision to allow hands-free phone use while driving.

Pagination: pp 157-164

Authors: Ishigami, Yoko; Klein, Raymond M

Publication Date: 2009

Serial: Journal of Safety Research
Volume: 40
Issue Number: 2
Publisher: Elsevier
ISSN: 0022-4375
OCLC: 1800052
Serial URL: <http://www.sciencedirect.com/science/journal/00224375>

Index Terms: Cell phones; Cellular telephones; Distraction; Driving; Handheld telephones; Hands-free telephones; Literature reviews; Literature surveys; Motor vehicle handling; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|---|
| Title: | The effects of practice with MP3 players on driving performance |
| Full Text URL: | http://www.sciencedirect.com/science/article/pii/S0001457508000000 |
| Abstract: | <p>This study examined the effects of repeated iPod(TM) interactions on driver performance to determine if performance decrements decreased with practice. Nineteen younger drivers (mean age = 19.4, range 18-22) participated in a seven session study in the University of Calgary Driving Simulator. Drivers encountered a number of critical events on the roadways while interacting with an iPod including a pedestrian entering the roadway, a vehicle pullout, and a lead vehicle braking. Measures of hazard response, vehicle control, eye movements, and secondary task performance were analyzed. Increases in perception response time and collisions were found while drivers were performing the difficult iPod tasks, which involved finding a specific song within the song titles menu. Over the course of the six experimental sessions, driving performance improved in all conditions. Difficult iPod interactions significantly increased the amount of visual attention directed into the vehicle above that of the baseline condition. With practice, slowed responses to driving hazards while interacting with the iPod declined somewhat, but a decrement still remained relative to the baseline condition. The multivariate results suggest that access to difficult iPod tasks while vehicles are in motion should be curtailed.</p> |
| Pagination: | pp 704-713 |
| Authors: | Chisholm, S L; Caird, J K; Lockhart, J |
| Publication Date: | 2008/03 |
| Serial: | Accident Analysis & Prevention Volume: 40 Issue Number: 2 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575 |
| Index Terms: | Automobile driving simulators; Distraction; Drivers; Driving; Driving simulators; Eye movements; iPod (Digital music player); Motor vehicle handling; Motor vehicle operators; Music; Practice; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

| | |
|--------------------------|---|
| Title: | Mitigating driver distraction with retrospective and concurrent feedback |
| Full Text URL: | http://www.sciencedirect.com/science/article/pii/S0001457508000145 |
| Abstract: | <p>An experiment was conducted to assess the effects of retrospective and combined retrospective and concurrent feedback on driver performance and engagement in distracting activities. A previous study conducted by the authors showed that concurrent (or real time) feedback can help drivers better modulate their distracting activities. However, research also shows that concurrent feedback can pose additional distractions due to the limited time and resources available during driving. Retrospective feedback, which is presented at the end of a trip (i.e., post-drive), can include additional information on safety critical situations during a trip and help the driver learn safe driving habits. A driving simulator study was conducted with 48 participants and 3 conditions: retrospective feedback, combined feedback (both retrospective and concurrent), and no feedback (baseline case). The feedback conditions (retrospective and combined) resulted in faster response to lead vehicle braking events as depicted by shorter accelerator release times. Moreover, combined feedback also resulted in longer glances to the road. The results suggest that both feedback types have potential to improve immediate driving performance and driver engagement in distractions. Combined feedback holds the most promise for mitigating the effects of distraction from in-vehicle information systems.</p> |
| Pagination: | pp 776-786 |
| Authors: | Donmez, Birsen; Boyle, Linda Ng; Lee, John D |
| Publication Date: | 2008/03 |
| Serial: | Accident Analysis & Prevention Volume: 40 Issue Number: 2 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575 |
| Index Terms: | Automobile driving simulators; Distraction; Driver communications; Driver feedback; Driver information systems; Drivers; Driving simulators; Eye movements; Highway communications; In vehicle advisory; In vehicle communications; Motor vehicle operators; Traffic information systems; Workload |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: Assessing the awareness of performance decrements in distracted drivers

Full Text URL: <http://www.sciencedirect.com/science/a...7M9-3/1/f8f87540eec7e571f80fdd035ffde712>

Abstract: Many studies have documented the performance decrements associated with driver distractions; however, few have examined drivers' awareness of these distraction effects. The current study measured how well-calibrated drivers are with respect to performance decrements from distracting tasks. In this test track study, 40 younger and older drivers completed a series of tasks on a hand-held or hands-free cell phone while driving around a course in an instrumented vehicle. Subjective estimates of performance decrements were compared to actual performance decrements. Although their driving performance suffered in dual-task conditions, drivers were generally not well-calibrated to the magnitude of the distraction effects ($r = -.38$ to $.16$). In some cases, estimates of distraction were opposite of the observed effects (i.e., smaller estimates of distraction corresponded to larger performance deficits). Errors in calibration were unassociated with several measures of overconfidence in safety and skill, among other variables. We discuss the implications of these findings for potential mitigation strategies for distracted driving.

Pagination: pp. 675-682

Authors: Horrey, William J; Lesch, Mary F; Garabet, Angela

Publication Date: 2008/03

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 2
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Awareness; Cell phones; Cellular telephones; Distraction; Drivers; Driving; Motor vehicle handling; Motor vehicle operators; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: Testing assumptions implicit in the use of the 15-second rule as an early predictor of whether an in-vehicle device produces unacceptable levels of distraction

Full Text URL: <http://www.sciencedirect.com/science/a...FMK-2/1/25d64fd8fda31e2a189e20895ff6d617>

Abstract: Given the proliferation of in-vehicle technologies, techniques must be developed to ensure devices do not produce unacceptable levels of distraction. One approach is to use static time on task (e.g., the 15-second rule). However, this practice makes three critical assumptions: (1) static time on task predicts time on task while driving; (2) time on task measured in a hazard-free environment predicts time on task when drivers expect hazards; (3) time on task predicts perceived distraction, collisions, and driving errors. To test these assumptions, two tasks were compared in 32 drivers using a driving simulator. The tasks were manipulating controls of a radio/tape deck and dialing a hand-held cellular phone. Static time on task underestimated dynamic time on task, though the differences between tasks were roughly consistent across testing conditions, with the cellular task taking more time. Participants who expected hazards required slightly more time on task than those who did not, but the effect was only marginal ($p = 0.09$) and consistent across tasks. Finally, the device with higher static time on task also produced significantly more lane deviations and perceived interference, though the predicted pattern of results did not emerge for collisions and hazard response time.

Pagination: pp 628-634

Authors: Reed-Jones, James; Trick, Lana M; Matthews, Michael

Publication Date: 2008

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 2
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Automobile driving simulators; Cell phones; Cellular telephones; Design standards; Distraction; Drivers; Driving; Driving simulators; In-vehicle technologies; Motor vehicle handling; Motor vehicle operators; Radio; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; Vehicles and Equipment; I83: Accidents and the Human Factor; I91: Vehicle Design and Safety

Title: Crash dieting: The effects of eating and drinking on driving performance

Full Text URL: <http://www.sciencedirect.com/science/a...YMD-1/2/689503c840b7dba27e27f80f313126a7>

Abstract: Previous research suggests that compared to mobile phone use, eating and drinking while driving is more common and is seen as lower risk by drivers. Nevertheless, snacking at the wheel can affect vehicle control to a similar extent as using a hands-free phone, and is actually a causal factor in more crashes. So far, though, there has not been a controlled empirical study of this problem. In an effort to fill this gap in the literature, we used the Brunel University Driving Simulator to test participants on a typical urban scenario. At designated points on the drive, which coincided with instructions to eat or drink, a critical incident was simulated by programming a pedestrian to walk in front of the car. Whilst the driving performance variables measured were relatively unaffected by eating and drinking, perceived driver workload was significantly higher and there were more crashes in the critical incident when compared to driving normally. Despite some methodological limitations of the study, when taken together with previous research, the evidence suggests that the physical demands of eating and drinking while driving can increase the risk of a crash.

Pagination: pp 142-148

Authors: Young, Mark S; Mahfoud, Janina M; Walker, Guy H; Jenkins, Daniel P; Stanton, Neville A

Publication Date: 2008/01

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 1
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Automobile driving simulators; Distraction; Driving; Driving simulators; Eating; Empirical methods; Motor vehicle handling; Traffic safety; Vehicle handling; Vehicle navigation; Workload

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: The effect of audio materials from a rear-seat audiovisual entertainment system or from radio on simulated driving

Full Text URL: <http://dx.doi.org/10.1016/j.trf.2007.05.005>

Full Text URL: <http://www.sciencedirect.com/science/a...5KR-1/2/ff5ba8a4791320fd4830ba9e29bb47fe>

Abstract: In-car audiovisual entertainment systems are increasingly prevalent, yet research on which to base appropriate legislation regarding their use is lacking. Current legislation seeks to prevent drivers from seeing the audiovisual display within their own vehicle. However, research suggests that the auditory materials alone may result in cognitive and auditory distraction that impairs driving. In a driving simulator experiment, 27 participants completed drives under each of three conditions: without audio materials, with audio materials from a movie, and with audio materials from radio. Performance was measured in terms of lateral control, speed control, and response to hazards. Participants provided self-reports of distraction and driving impairment. Audio materials appeared to have minimal effects on driving, perhaps because listening while driving is fairly well practiced and easily modulated, and does not involve speech production. There appears to be no need for regulations relating to such auditory entertainment materials. Nonetheless, further research is required regarding the effects of multiple concurrent distractors on real-world driving.

Pagination: pp. 52-60

Authors: Hatfield, Julie; Chamberlain, Timothy

Publication Date: 2008/01

Serial: Transportation Research Part F: Traffic Psychology and Behaviour
Volume: 11
Issue Number: 1
Publisher: Elsevier
ISSN: 1369-8478
Serial URL: <http://www.sciencedirect.com/science/journal/13698478>

Index Terms: Automobile driving simulators; Cognition; Distraction; Drivers; Driving simulators; Entertainment systems; Motor vehicle operators; Radio; Rear seats

Subject Areas: Highways; Safety and Human Factors; Vehicles and Equipment; I83: Accidents and the Human Factor; I91: Vehicle Design and Safety

| | |
|--------------------------|--|
| Title: | The effect of text messaging on driver behaviour: a simulator study |
| Abstract: | <p>RAC Foundation (2008) reported the results of a survey of 2,000+ users of Facebook, showing that 45% of UK drivers engage in texting whilst driving. The RAC Foundation commissioned TRL to study the impairment caused by texting whilst driving using TRL's driving simulator. Seventeen drivers (aged 17-24 years) took part in the study. Drivers completed one drive as normal (undistracted) and one drive in which they completed text messaging tasks. Participants were impaired in their performance when reading and writing text messages, particularly reaction time and ability to maintain lateral vehicle control. Reaction times were around 35% slower when writing a text message. Earlier studies at TRL showed that alcohol consumption to the legal limit caused a 12% reaction time increase; cannabis slowed reaction times by 21%. When texting, drivers slowed significantly, indicating that they recognised the impairment, attempting to mitigate risk by reducing speed. However, greater lateral variability in lane position and drifting into adjacent lanes when texting are not mitigated by speed reduction and would lead to potential conflict with other traffic. Female drivers showed greater variability in lateral lane position when texting than male drivers. However, female participants tended to show greater speed reductions, indicating that they may have had greater awareness that their driving was impaired. This study highlighted that when texting, a driver may present a greater accident risk than when at the legal limit for alcohol consumption or when under the influence of cannabis, reinforcing that drivers should refrain from this dangerous activity. (A)</p> |
| Pagination: | 367 |
| Authors: | Reed, N; Robbins, R |
| ISBN: | 9781846087523 |
| Publication Date: | 2008 |
| Index Terms: | Accidents; Alcohols; Automobile driving simulators; Behavior; Behaviour; Carriageways; Communications; Danger; Deceleration; Distraction; Drivers; Driving; Driving simulators; Drugs; Females; Great Britain; Hazards; Human behavior; Human beings; Man; Messages (Communications); Motor reactions; Motor vehicle handling; Motor vehicle operators; Public safety; Recently qualified drivers; Roadway; Safety; Safety measures; Telephone; Traffic lanes; Traveled way; United Kingdom; Vehicle handling; Vehicle navigation; Women |
| Subject Areas: | Highways; Safety and Human Factors; I80: Accident Studies; I81: Accident Statistics; I83: Accidents and the Human Factor |

| | |
|--------------------------|--|
| Title: | Effect of Wireless Communication and Entertainment Devices on Simulated Driving Performance |
| Full Text URL: | http://dx.doi.org/10.3141/2069-07 |
| Abstract: | <p>An analysis of the effect of wireless telephone communication using text and voice modalities as well as an Apple iPod on lane keeping, speed, speed variability, lateral speed, and lane position variability was conducted with a driving simulator. Participants (young adult licensed drivers) drove in an unusually curvy simulated driving environment while using wireless devices, controlling an iPod, and participating in conversations and word games. As expected on the basis of previous research, lane-keeping performance was robust for voice communication tasks; however, the text messaging and iPod tasks that required significant manual manipulation of the device resulted in significant decrements in lane-keeping performance. In addition, all wireless communication tasks and the iPod task resulted in significant increases in speed variability throughout the driving scenario. Lateral speed increases occurred for all wireless communication tasks other than the cellular phone conversation as well as the iPod task. Increases in lane position variability were observed for the text messaging conditions. In addition to establishing the dramatic performance decrement caused by text messaging tasks, this experiment suggests that driving performance may be affected by distraction in ways not captured by lane-keeping measures alone and explores potential alternative measures of driving performance that may be useful for identifying and quantifying the effects of distracted driving.</p> |
| Pagination: | pp 48-54 |
| Authors: | Crisler, Matthew C; Brooks, Johnell O; Ogle, Jennifer H; Guirl, Chris D; Alluri, Priyanka; Dixon, Karen K |
| ISBN: | 9780309113410 |
| Publication Date: | 2008 |
| Serial: | Transportation Research Record: Journal of the Transportation Research Board Issue Number: 2069 Publisher: Transportation Research Board ISSN: 0361-1981 |
| Index Terms: | Automobile driving simulators; Bends (Roads); Cell phones; Cellular telephones; Distraction; Drivers; Driving; Driving performance; Driving simulators; Highway curves; Highway safety; iPod (Digital music player); Lane position; Lanekeeping; Motor vehicle handling; Motor vehicle operators; Road curves; Road safety; Short message service; SMS (Short message service); Speed; Speed variability; Text messaging; Texting; Vehicle handling; Vehicle navigation; Wireless communication systems |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: **The Relationship Between Chronic Sleep Deficits and Distractions in Young Adult Drivers**

Abstract: The relationship between distractions and chronic sleep deficits on driving mistakes among university undergraduates between the ages of 19 and 23 is reported on. All participants were asked to drive, housed in a Fiat Cinquencento, a fixed-based driving simulator, and to complete a sleeping habit questionnaire. Distractions drivers faced included talking on a mobile phone with the experimenter during the drive, opening a sweet wrapper, taking a drink, operating a radio, and reading a map. Results showed that drivers, when distracted, had more road edge excursions and speed limit exceedances. Participants who had chronic sleep debt showed a significant difference in speed exceedances than those who had sufficient sleep. Results also indicated significant positive correlations between distracted drivers and feeling uncomfortable during the day and obtaining too little sleep and speed exceedances. The correlation between actual sleep hours and speed exceedances was significantly negatively. Difficulty in waking up and number of collisions exhibited a positive correlation, even without driver distraction. Study results indicate that when distracted, young drivers are more likely to make driving errors when they have chronic sleep deficits.

Pagination: pp 57-64

Authors: Fagbemi, O S; Pfeffer, K

Publication Date: 2007/12

Serial: Advances in Transportation Studies
Publisher: University Roma Tre
ISSN: 1824-5463

Index Terms: Automobile driving simulators; Distraction; Driving simulators; Overspeed; Sleep deprivation; Speeding; Younger drivers

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: **Hands-Free Versus Hand-Held Cell Phone Conversation on a Braking Response by Young Drivers**

Abstract: This article reports on a study undertaken to examine some braking responses to see if conversing on hands-free or hand-held cell phones differs regarding the driver's ability to respond quickly. The study participants were college-age drivers (n=25) who completed reaction time trials in go/no-go situations under three conditions: control (no cell phone or conversation), conversing on hands-free cell phone, or conversing on hand-held cell phone. The participants had to move the right foot from one pedal to another as quickly as possible in response to a visual signal in a lab setting. Results showed significantly slower reaction times, movement times, and total response times for both cell phone conditions compared to the control. No differences were found between hands-free and hand-held phone conditions. The authors conclude that their results support the idea that talking on cell phones, regardless if it is hands-free or hand-held, reduces speed of information processing while driving.

Pagination: pp 514-522

Authors: Hendrick, Joy L; Switzer, Jamie R

Publication Date: 2007/10

Serial: Perceptual and Motor Skills
Volume: 105
Issue Number: 2
Publisher: Ammons Scientific
ISSN: 0031-5125

Index Terms: Automobile driving; Automobile driving simulators; Braking; Cell phones; Cellular telephones; Conversation; Distraction; Driving simulators; Human information processing; Reaction time

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: College Students Use Cell Phones While Driving More Frequently Than Found in Government Study

Abstract: Cellular phone use while driving is hazardous; it quadruples the risk of a collision and multiplies the risk of a fatality 9-fold. The National Highway Traffic Safety Administration estimates 8% of young drivers and 5% of all drivers use cellular phones while driving. In this research, the authors trained graduate student volunteers to observe the daytime cellular phone use of 3,650 drivers leaving the student exits of college parking structures at a large university. The student observers recorded a cellular phone usage rate of 11.1%, which was significantly higher than that seen in the National Occupant Protection Use Survey ($p < .00001$). Female drivers were 1.51 times more likely to be using a cellular phone while driving than were men (12.9% vs 8.6%, $p < .001$), and drivers with passengers were 0.15 times more likely to drive while telephoning than were solo drivers (1.8% vs 12.1%, $p < .001$). The authors offer suggestions for possible interventions to reduce this hazardous behavior.

Pagination: pp 181-184

Authors: Cramer, Sheryl; Mayer, Joni; Ryan, Sherry

Publication Date: 2007/09

Serial: Journal of American College Health
Volume: 56
Issue Number: 2
Publisher: American College Health Association
ISSN: 0744-8481

Index Terms: Accident causes; Accident factors; Accident responsibility; Automobile drivers; Automobile driving; Cell phones; Cellular telephones; College students; Distraction; Highway accidents; Human factors in accidents; Traffic accidents

Subject Areas: Education and Training; Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: Interaction Between Visual Status, Driver Age and Distracters on Daytime Driving Performance

Abstract: This study investigated the effects of visual status, driver age, and the presence of secondary distracter tasks on driving performance. 20 young (M = 26.8 years) and 19 old (M = 70.2 years) participants drove around a closed-road circuit under 3 visual (normal, simulated cataracts, blur) and 3 distracter conditions (none, visual, auditory). Simulated visual impairment, increased driver age, and the presence of a distracter task detrimentally affected all measures of driving performance except gap judgments and lane keeping. Significant interaction effects were evident between visual status, age, and distracters; simulated cataracts had the most negative impact on performance in the presence of visual distracters and a more negative impact for older drivers. The implications of these findings for driving behavior and acquisition of driving-related information for people with common visual impairments are discussed.

Pagination: pp 2225-2231

Authors: Wood, Joanne M; Chaparro, Alex; Hickson, Louise

Publication Date: 2009/08

Serial: Vision Research
Volume: 49
Issue Number: 17
Publisher: Elsevier
ISSN: 0042-6989

Index Terms: Accident proneness; Age; Automobile drivers; Distraction; Driving performance; People with visual disabilities; Vision; Visual perception; Visually impaired persons

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: Driver distraction based lane-keeping assistance

Full Text URL: <http://www.sciencedirect.com/science/a...HWB-1/2/22e7e2d92e93232dc9c87aa6b6f4abf7>

Abstract: Driver assistance systems could be much more effective, if they were adaptive to the driver's state. Following the idea of a lane-keeping assistance system, which is adaptive to the use of in-vehicle information systems (IVIS), two field experiments were conducted. The first experiment concerned the influence of typical IVIS tasks on lane-keeping. Most IVIS tasks increased the lateral deviations, but in the majority of cases the drivers were still able to stay in their lane. The second experiment concerned two questions: (1) how much lateral support would be needed and (2) how drivers accept this kind of support. The results show that all lateral support algorithms increased the lane-keeping performance with the algorithms providing a higher amount of assistance proving the most useful. All assistance systems were rated as helpful and were considered to increase driver safety, both by the drivers who did not have problems in lane-keeping without assistance. In light of these results an adaptation of a lateral support system to the IVIS-use seems to be useful and worthwhile.

Pagination: pp 288-299

Authors: Blaschke, C; Breyer, F; Farber, B; Freyer, J; Limbacher, R

Publication Date: 2009

Serial: Transportation Research Part F: Traffic Psychology and Behaviour
Volume: 12
Issue Number: 4
Publisher: Elsevier
ISSN: 1369-8478
Serial URL: <http://www.sciencedirect.com/science/journal/13698478>

Index Terms: Advanced Driver Assistance Systems; Algorithms; Distraction; Driver assistance systems (In vehicle); Driver communications; Driver information systems; Driver support systems; Drivers; Electronic co-pilots; Field studies; Highway communications; In vehicle advisory; In vehicle communications; Lane departure; Motor vehicle operators; Traffic information systems

Subject Areas: Highways; Safety and Human Factors

Title: **Real-World Personal Conversations Using a Hands-Free Embedded Wireless Device while Driving: Effect on Airbag-Deployment Crash Rates**

Abstract: This article describes the use of a wireless device embedded in the vehicle that allows the user to engage in a personal hands-free conversation (HFC), and that automatically places an emergency notification call to an OnStar call center if the vehicle is involved in a crash in which its airbag deployed. The authors report the results from a database of the exact counts, start timestamps, and billed durations of all HFC and airbag notification calls. Over a period of 30 months of naturalistic driving, the database included 91 million HFC calls from an average of 323,994 drivers per month who made calls. There were 14 airbag deployments in 276 million driver-minutes of HFC conversation; when drivers were using the telephone, there was an incidence rate of 5.08 airbag crashes per 100 million driver-minutes. There were 2,023 airbag deployments in an estimated 24.7 billion driver-minutes of no HFC conversation; when drivers were not using the telephone, there was an incidence rate of 8.18 airbag crashes per 100 million driver-minutes. The crash incidence rate ratio (IRR) is the ratio of these two rates or 0.62. Sensitivity analyses controlled for the impact on the crash IRR of estimated time spent driving per day and calls by passengers. Counting all crashes as much as 20 minutes later than a call as related to that call gave similar results. The authors conclude that for personal conversations using a hands-free embedded device, the risk of an airbag crash is somewhere in a range from a moderately lower risk to a risk near that of driving without a recent personal conversation. They note that these results are not consistent with the large increase in crash risk reported in epidemiological studies using the case-crossover method.

Pagination: pp 187-204

Authors: Young, Richard A; Schreiner, Christopher

Publication Date: 2009

Serial: Risk Analysis
Volume: 29
Issue Number: 2
Publisher: Society for Risk Analysis
ISSN: 0272-4332

Index Terms: Automobile drivers; Cell phones; Cellular telephones; Conversation; Distraction; Hands free cellular telephones; Highway accidents; Highway safety; OnStar (Motorist aid system); Risk assessment; Road safety; Traffic accidents; Vulnerability assessment

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|---------------------------|---|
| Title: | Teen Unsafe Driving Behaviors: Focus Group Final Report ♦ |
| Abstract: | The National Organization for Youth Safety (NOYS) has been working with the National Highway Traffic Safety Administration (NHTSA) to identify strategies for counteracting dangerous driving behaviors among teenage motorists and passengers. A project was developed to support these efforts and a steering committee was convened. Among the suggestions of the steering committee was that focus groups should be conducted. The purpose of this document is to summarize the results of these focus groups and to discuss the implications of these results for NHTSA's youth programs. The following topics are addressed: Methodology; Summary of Responses by Group; Findings by Program Area (Driver licensing, Impaired driving, Enforcement, Safety belt use, Speed, Distracted driving, and Drowsy driving); Message and Delivery System Recommendations; and Additional Thoughts on the Teenage Brain. Appendices contain (A) Focus Group Screener, (B) Focus Group Questions, and (C) Summary of Final Working Group Meeting. |
| Pagination: | 87p |
| Corporate Authors: | National Highway Traffic Safety Administration |
| Publication Date: | 2006/09 |
| Index Terms: | Behavior; Behaviour; Distraction; Driver licensing; Driving under the influence; Driving while intoxicated; Drowsiness; Drunk driving; DUI; DWI; Focus groups; Human behavior; Juvenile automobile drivers; Law enforcement; Overspeed; Seat belt use; Seat belts; Speeding; Teenage drivers |
| Subject Areas: | Highways; Safety and Human Factors; Security and Emergencies; I83: Accidents and the Human Factor |

| | |
|---------------------------|---|
| Title: | The Impact of Driver Inattention on Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data ♦ |
| Full Text URL: | http://www-nrd.nhtsa.dot.gov/departmen...er-distraction/PDF/DriverInattention.pdf |
| Abstract: | <p>The purpose of this report was to conduct in-depth analyses of driver inattention using the driving data collected in the 100-Car Naturalistic Driving Study. An additional database of baseline epochs was reduced from the raw data and used in conjunction with the crash and near-crash data identified as part of the original 100-Car Study to account for exposure and establish near-crash/crash risk. The analyses presented in this report are able to establish direct relationships between driving behavior and crash and near-crash involvement. Risk was calculated (odds ratios) using both crash and near-crash data as well as normal baseline driving data for various sources of inattention. The corresponding population attributable risk percentages were also calculated to estimate the percentage of crashes and near-crashes occurring in the population resulting from inattention. Additional analyses involved: driver willingness to engage in distracting tasks or driving while drowsy; analyses with survey and test battery responses; and the impact of driver's eyes being off of the forward roadway. The results indicated that driving while drowsy results in a four- to six-times higher near-crash/crash risk relative to alert drivers. Drivers engaging in visually and/or manually complex tasks have a three-times higher near-crash/crash risk than drivers who are attentive. There are specific environmental conditions in which engaging in secondary tasks or driving while drowsy is more dangerous, including intersections, wet roadways, and areas of high traffic density. Short, brief glances away from the forward roadway for the purpose of scanning the driving environment are safe and actually decrease near-crash/crash risk. Even in the cases of secondary task engagement, if the task is simple and requires a single short glance, the risk is elevated only slightly, if at all. However, glances totaling more than 2 seconds for any purpose increase near-crash/crash risk by at least two times that of normal, baseline driving.</p> |
| Pagination: | 226p |
| Authors: | Klauer, S G; Dingus, T A; Neale, V L; Sudweeks, J D; Ramsey, D J |
| Corporate Authors: | Virginia Polytechnic Institute and State University, Blacksburg National Highway Traffic Safety Administration |
| Publication Date: | 2006/04 |
| Index Terms: | Accident risk; Attention lapses; Behavior; Behaviour; Distraction; Drivers; Drowsiness; Glance duration; Highway accidents; Human behavior; Human factors in accidents; In-vehicle tasks; Motor vehicle operators; Near miss accidents (Ground transportation); Odds ratio; Risk analysis; Secondary tasks; Traffic accidents |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

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|---------------------------|--|
| Title: | Effect of Auditory Intersection Collision Avoidance Warnings on Driving Behaviors in Different Distracted Driving Conditions ♦ |
| Full Text URL: | http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/esv/esv19/05-0241-O.pdf |
| Abstract: | <p>In-vehicle information systems (IVIS) have become popular; IVIS could be used to provide drivers with a variety of information (e.g., en-route guidance information and collision warning information) via different in-vehicle devices. In Taiwan, some aggressive driving behaviors are observed such as tailgating and violating traffic signals. Intersection collision warning system (ICWS) provided by IVIS could be used for avoiding the accidents due to violating traffic signals. This study employed a driving simulator to investigate the influence of auditory collision warning messages on drivers' perception-reaction times and workload when the drivers were visually or audibly distracted by secondary tasks via different IVIS devices. The secondary task was to solve simple mathematical problems displayed to the driver three different formats: voice, numbers shown on a liquid crystal display (LCD) panel, and number shown on a heads-up display (HUD). The most important finding of the study was that the auditory collision warning message was capable of decreasing drivers' perception-reaction times when the drivers were visually distracted by the mathematical problems shown on the LCD panel or the HUD. However, when the drivers were distracted by an auditory task (i.e., hearing mathematical problems), the auditory collision warning message increased drivers' perception-reaction times.</p> |
| Pagination: | 5p |
| Authors: | Chen, Wan-Hui; Zeng, Jian-Ji; Kao, Kui-Chuan |
| Corporate Authors: | National Highway Traffic Safety Administration |
| Publication Date: | 2005/06 |
| Conference: | 19th International Technical Conference on the Enhanced Safety of Vehicles |
| Index Terms: | ADIS; Advanced driver information systems; Aggression; Aggressiveness (Psychology); Audible warning devices in vehicles; Auditory warnings; Behavior; Behaviour; Collision avoidance systems; Distraction; Drivers; Human behavior; Motor vehicle operators; Perception; Reaction time; Red light running; Secondary tasks; Signalised intersections; Signalized intersections; Tailgating; Workload |
| Subject Areas: | Highways; Safety and Human Factors; Vehicles and Equipment; I83: Accidents and the Human Factor; I91: Vehicle Design and Safety |

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|---------------------------|--|
| Title: | Assessment of Truck Driver Distraction Problem and Research Needs ♦ |
| Full Text URL: | http://ntl.bts.gov/lib/jpodocs/repts_te/14260.htm |
| Full Text URL: | http://ntl.bts.gov/lib/jpodocs/repts_te/14260_files/14260.pdf |
| Abstract: | <p>The issue of driver distraction associated with the use of in-vehicle devices in heavy vehicles was explored through interviews with truck drivers and safety regulators. In order to characterize some of the interface designs and better understand their interaction demands, a sample of commercially available in-vehicle devices was examined. The extent to which these devices conformed to available human factors guidelines and accepted practices was assessed analytically. Industry device design and evaluation practices were also explored via contacts with equipment suppliers and industry Original Equipment Manufactures. Truck driver distraction is perceived by many drivers and safety regulators to be a problem, although it is not generally viewed as a high priority issue. Fleet-based communication devices, which include text-based messaging functions, are widely available and used by the industry. These devices can potentially impose high levels of attentional demand if used while driving since they require numerous inputs and multi-line text displays which have been shown to impair driving performance. Manufacturers of these types of systems tend to provide the capability to restrict driver interactions with these systems while driving (e.g., lock-out the ability to read or send text messages); our interactions with drivers in our sample suggests that many organizations do not necessarily elect to fully implement these restrictions, and there is no uniformly adopted practice for dealing with these types of devices. Product developers and OEMs appear to involve drivers in product development and testing (primarily in order to ensure their products conform to the customers needs); however, objective testing to evaluate the attentional demands of devices may not be widely used.</p> |
| Pagination: | 84p |
| Authors: | Llaneras, Robert E; Singer, Jeremiah P; Bowers-Carnahan, Renae |
| Corporate Authors: | Westat National Highway Traffic Safety Administration |
| Publication Date: | 2005/05 |
| Index Terms: | Advanced transport telematics; ATT; Automotive telematics; Distraction; Driver communications; Driver information systems; Highway communications; In vehicle advisory; In vehicle communications; Intelligent transportation systems; Intelligent vehicle highway systems; ITS (Intelligent transportation systems); IVHS; Motor truck transportation; Road transport informatics; RTI; Telematics; Traffic information systems; Truck accidents; Truck drivers; Truck driving; Truck traffic; Truck transportation; Trucking |
| Subject Areas: | Freight Transportation; Highways; Motor Carriers; Operations and Traffic Management; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: **Driving Performance During Cell Phone Conversations and Common In-Vehicle Tasks While Sober and Drunk**

Full Text URL: <http://www.lrrb.org/PDF/200541.pdf>

Abstract: The crash risk associated with cell phone use while driving is a contentious issue. Many states are introducing Advanced Traveler Information Systems (ATIS) that may be accessed with cell phones while driving (e.g. 511 Traveler Information Services). In these contexts, there is a need for relevant research to determine the risk of cell phone use. This study compared driver performance while conversing on a hands-free cell phone to conditions of operating common in-vehicle controls (e.g., radio, fan, air conditioning) and alcohol intoxication (BAC 0.08). In addition, the study examined the combined effects of being distracted and being intoxicated given that there may be a higher risk of a crash if the driver engages in a combination of risk factors. During simulated traffic scenarios, resource allocation was assessed through behavioral measures and an event-related potential (ERP) novelty oddball paradigm. The results indicated that during a car following scenario, drivers engaged in the conversations or completing in-vehicle tasks were more impaired than drivers that were not involved in any distraction task. Indeed, both the cell phone and in-vehicle sources of distraction were generally more impairing than intoxication at the legal limit. These results will be used in a follow up study in order to compare the effects on attention of driving and using 511 to distraction from these tested distractions.

Pagination: 203p

Authors: Rakauskas, Michael; Ward, Nicholas; Bernat, Edward; Cadwallader, Meredith; Waard, Dick De

Corporate Authors: University of Minnesota, Minneapolis
Minnesota Department of Transportation

Publication Date: 2005/10

Index Terms: 511 (National Travel Information Number); Accident risk forecasting; Advanced traveler information systems; Alcohol in the body; Attention; Behavior; Behaviour; Blood alcohol levels; Car following; Cell phones; Cellular telephones; Conversation while driving; Distraction; Drivers; Driving; Driving under the influence; Driving while intoxicated; Drunk driving; DUI; DWI; Hands free cellular telephones; Highway accidents; Highway safety; Human behavior; Impaired drivers; In vehicle controls adjustment; Motor vehicle handling; Motor vehicle operators; Performance; Road safety; Traffic accidents; Traffic safety; Traffic simulation; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: **Sleepiness/Fatigue and Distraction/Inattention as Factors for Fatal Versus Nonfatal Commercial Motor Vehicle Driver Injuries ♦**

Full Text URL: <http://www.sciencedirect.com/science/a...9VK-1/1/253424b7f05c2548bca5e0aba5f0befa>

Full Text URL: <http://www.sciencedirect.com/science/a...9VK-1/2/1e8082cd868045fbb9f2d26ff6ff39c1>

Abstract: Sleepiness and fatigue have long been considered serious risk factors for collisions in truck drivers who tend to work long hours and are likely to be sleep deprived. This paper describes a population based case-control study to investigate whether driver sleepiness/fatigue and distraction/inattention were the primary human factors involved in an occupational motor vehicle collision (MVC) fatality, while unsafe speed and alcohol were the primary contributing factors for a nonoccupational MVC fatality. This case-control study was conducted to determine the increased odds of a Kentucky commercial vehicle collision (CVC) being fatal if the driver was reported as (a) fatigued or asleep or (b) inattentive/distracted. The results of the study found that falling asleep/fatigue and distraction/inattention were both strongly associated with a fatal CVC outcome. In addition, truck drivers over 51 years of age and not wearing a safety belt were at increased risk for a CVC fatality.

Pagination: pp 862-869

Authors: Bunn, T L; Slavova, S; Struttmann, T W; Browning, S R

Publication Date: 2005/09

Serial: Accident Analysis & Prevention
Volume: 37
Issue Number: 5
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Case studies; Commercial vehicle operations; CVO; Death; Distraction; Fatal accidents; Fatalities; Fatigue (Biology); Fatigue (Physiological condition); Human factors in accidents; Injuries; Injury; Kentucky; Motor vehicle accidents; Seat belt use laws; Seat belts; Sleep; Traffic fatalities; Trauma; Truck drivers

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|---|
| Title: | Driver-initiated distractions: Examining strategic adaptation for in-vehicle task initiation |
| Full Text URL: | http://www.sciencedirect.com/science/a...54G-1/2/a6f2036ebc312cc508988ab441152aa0 |
| Abstract: | <p>Today, drivers are faced with many in-vehicle activities that are potentially distracting. In many cases, they are not passive recipients of these tasks; rather, drivers decide whether or not (or how) to perform them. In this study, we examined whether drivers, given knowledge of the upcoming road demands, would strategically delay performing in-vehicle activities until demands were reduced. Twenty drivers drove an instrumented van around a closed track that was divided into sections of varying demands and difficulty. Drivers were asked to perform one of four in-vehicle tasks (e.g., phone conversation; read a text message; find an address; pick up an object on the floor); however, they were free to decide when to initiate these tasks, provided they finish them before a given deadline. Although drivers were fully aware of the relative demands of the road, they did not tend to strategically postpone tasks--a finding that was consistent across the different tasks ($p > .05$). Rather, drivers tended to initiate tasks regardless of the current driving conditions. This strategy frequently led to driving errors. Given the control that drivers have over many in-vehicle distractions, interventions that focus on strategic decisions and planning may have merit.</p> |
| Pagination: | pp 115-122 |
| Authors: | Horrey, William J; Lesch, Mary F |
| Publication Date: | 2009 |
| Serial: | Accident Analysis & Prevention Volume: 41 Issue Number: 1 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575 |
| Index Terms: | Adaptation (Psychology); Distraction; Drivers; Goals; Motor vehicle operators; Multitasking; Objectives; Priorities; Strategic planning; Strategies |
| Subject Areas: | Highways; Safety and Human Factors |

Title: Driving while conversing: Cell phones that distract and passengers who react

Record URL: <http://www.sciencedirect.com/science/a...RPC-2/2/7628c7da43d7483686f95216df65db3f>

Abstract: The research systematically compared the driving performance and conversational patterns of drivers speaking with in-car passengers, hands-free cell phones, and remote passengers who could see the driver's current driving situation (via a window into a driving simulator). Driving performance suffered during cell phone and remote passenger conversations as compared with in-car passenger conversations and no-conversation controls in terms of their approach speeds, reaction times, and avoidance of road and traffic hazards. Of particular interest was the phenomenon of conversation suppression, the tendency for passengers to slow their rates of conversation as the driver approached a hazard. On some occasions these passengers also offered alerting comments, warning the driver of an approaching hazard. Neither conversation suppression nor alerting comments were present during cell phone conversations. Remote passengers displayed low levels of alerting comments and conversation suppression, but not enough to avoid negative effects on driving performance. The data suggested that conversation modulation was a key factor in maintaining driving performance and that seeing the road and traffic was not sufficient to produce it. A second experiment investigated whether a cell phone modified to emit warning tones could alleviate some of the adverse effects typically associated with cell phone conversations. The modified cell phone produced discourse patterns that were similar to passenger conversations and driving performance nearly as good as that of drivers who were not conversing. This latter finding supported the argument that conversation modulation is a key ingredient in avoiding adverse effects of conversations with drivers, rather than the physical presence of an in-car passenger.

Pagination: pp. 160-173

Authors: Charlton, Samuel G

Publication Date: 2009/01

Serial: Accident Analysis & Prevention
Volume: 41
Issue Number: 1
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Automobile driving simulators; Cell phones; Cellular telephones; Conversation; Distraction; Driving; Driving simulators; Motor vehicle handling; Passengers; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors

Title: Navigational conversation impairs concurrent distance judgments

Full Text URL: <http://www.sciencedirect.com/science/article/pii/S0001457509000145>

Abstract: Dual-task performance as it relates to driving, such as tuning a radio or manipulating a cellular phone, forces drivers to divide their attention between the traffic demands and the in-car task. The present study investigated how concurrent spatial or non-spatial cognitive distractions mediated proximity judgments using vehicular stimuli. Utilizing a modified version of the task employed by [Elias, L.J., Robinson, B. in press. Drive on the right side of the road: perceptual asymmetries for judgments of automobile proximity. International Journal of Neuroscience.] the current study examined how mental navigation (spatial distraction) affected accuracy and response time for depth judgments on vehicular stimuli in each visual field. These were compared to a control condition in which no distraction was present, as well as when a semantic (non-spatial) distraction was present. We found that conversation of a navigational nature (i.e., spatial distraction) most negatively impacted accuracy and response time when processing dynamically changing vehicle proximity. Further, these deleterious effects appeared to be uniform throughout the visual field. Findings are related to driving while being distracted, with particular emphasis on the role of cerebral lateralization in dual-task performance.

Pagination: pp 36-41

Authors: Patrick, Regan E; Elias, Lorin J

Publication Date: 2009/01

Serial: Accident Analysis & Prevention
Volume: 41
Issue Number: 1
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Attention; Distance perception; Distraction; Drivers; Driving; Motor vehicle handling; Motor vehicle operators; Navigation; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors

| | |
|--------------------------|--|
| Title: | Distraction and drowsiness - a field study: technical report |
| Full Text URL: | http://www.vti.se/EPiBrowser/Publikationer%20-%20English/R638A.pdf |
| Abstract: | <p>The main goal of the distraction and drowsiness field study was to evaluate a system for detecting driver distraction and drowsiness. This report focuses on the system implementation and the algorithms detecting distraction and drowsiness. A vehicle was instrumented with video cameras, an automatic eye tracker and GPS receivers. Further data were read from the CAN bus of the car. The data were logged continuously with high frequency. The log system operated autonomously. Seven participants drove the vehicle during one month each. During the first ten days a behavioural baseline was collected. Afterwards the warnings were activated, such that the drivers received distraction warnings in form of a vibration in the seat when the algorithm determined that they had looked away from the forward roadway too much. A separate algorithm judged whether the drivers were drowsy or not. Questionnaires were administered on three occasions during the course of the study. No major problems were encountered during the field operational test (FOT), but a number of smaller problems had to be solved. However, in the end of the data collection period the computer installed in the car became more and more unstable, which led to increased data loss.</p> |
| Pagination: | 118 s |
| Authors: | Kircher, Katja; Kircher, Albert; Claezon, Fredrich |
| Publication Date: | 2009 |
| Serial: | VTI. VTI rapport 638A |
| Index Terms: | Algorithms; Data acquisition; Data collection; Detection and identification; Distraction; Drivers; Driving; Drowsiness; Eye movements; Fatigue (Biology); Fatigue (Physiological condition); Field tests; In situ tests; Motor vehicle handling; Motor vehicle operators; Questionnaires; Recording; Test methods; Test procedures; Tests; Vehicle handling; Vehicle navigation; Warning systems |
| Subject Areas: | Safety and Human Factors |

Title: Dissociation between driving performance and drivers' subjective estimates of performance and workload in dual-task conditions

Full Text URL: <http://www.sciencedirect.com/science/a...MXJ-1/2/9aa4b15678c80a75cfbe1ffca0cfe236>

Abstract: The current study measured how concurrent driving and in-vehicle activities of different levels of engagement varied in terms of performance and subjective estimates of demand and performance. In this test track study, 41 younger and older drivers completed a series of cognitive tasks while driving an instrumented vehicle. One task involved an engaging guessing game where drivers tried to guess the identity of an object. The other task involved a simple mental arithmetic task. We observed some dissociation between drivers' performance and their subjective reports. For instance, drivers tended to estimate their performance as better for the more engaging guessing task than the arithmetic task, though their performance was actually worse. At the same time, subjective estimates of workload across the two tasks did not vary in the dual-task condition even though they did in the single-task baseline conditions, suggesting that drivers failed to account for the added demands in dual-task situations. We discuss the implications of these findings for driver safety. Crashes due to distraction can carry tremendous costs for employers, in terms of injury, disability, and loss of potentially productive work years, whether these crashes occur on or off the job.

Pagination: pp 7-12

Authors: Horrey, W J; Lesch, M F; Garabet, A

Publication Date: 2009

Serial: Journal of Safety Research
Volume: 40
Issue Number: 1
Publisher: Elsevier
ISSN: 0022-4375
OCLC: 1800052
Serial URL: <http://www.sciencedirect.com/science/journal/00224375>

Index Terms: Dissociation; Distraction; Drivers; Driving; Motor vehicle handling; Motor vehicle operators; Multitasking; Vehicle handling; Vehicle navigation; Workload

Subject Areas: Highways; Safety and Human Factors

| | |
|---------------------------|---|
| Title: | Difference in Response of Male and Female Drivers to Everyday Distractions |
| Source: | Transportation Research Board Annual Meeting 2009 Paper #09-2433 |
| Abstract: | Two experiments using a driving simulation task examined the distracting effects of the most common secondary tasks that young drivers engage in: conversation and listening to music. The first experiment, by the use of experimental confederates engaged the drivers in a naturalistic conversation either over a mobile phone or as a passenger. The distracting consequences of these conditions had different effects for the male and female drivers. Relative to a silent control condition the female drivers appeared to be more distracted when conversing on a mobile phone than did the male drivers, and the male drivers appeared to be more distracted by the conversation with a passenger. The second experiment examined the effect of listening to music, and whether its tempo was important in determining its role as a source of distraction. Young drivers listened to music that had been chosen on the basis of its current popularity that either had a fast or a slow tempo, and drove a programmed route that required both easy and difficult driving maneuvers. Gender influences were again observed in the easy driving environment. Male drivers made more errors listening to slow tempo music, than they did to fast tempo music; whereas the opposite was found for the female drivers. The increased errors made by all drivers in the more difficult driving environment did not reveal any differential effects due to tempo or gender. The results of this study are interpreted in terms of differences in gender susceptibility to optimal mental workloads for driving. |
| Authors: | Faulks, Ian J; Irwin, Julia Deborah; Macquarie University; Chekaluk, Eugene |
| Corporate Authors: | Transportation Research Board |
| Publication Date: | 2009 |
| Conference: | Transportation Research Board 88th Annual Meeting |
| Index Terms: | Automobile driving simulators; Design of experiments; Distraction; Driving simulators; Experimentation; Experiments; Gender; Public safety; Response time; Safety; Safety measures; Travel behavior; Young adults; Younger drivers |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: Do Drivers' Estimates of Distraction Become Calibrated to Their Actual Distracted Driving Performance with Greater Exposure?

Source: Transportation Research Board Annual Meeting 2009 Paper #09-3251

Abstract: Numerous studies have documented the negative effects of distractions on driving performance, but are drivers aware of these effects and do they accurately perceive their distracted driving ability? Previous empirical work suggests that drivers' perceptions are not well-calibrated to actual dual-task decrements; however, these studies only assessed drivers' perceptions during a single session. The current study evaluated how drivers' estimates of distracted driving performance changed with increased exposure relative to their actual performance. Twelve young drivers drove an instrumented van around a closed-loop test track while performing several driving tasks with and without a secondary task over 4 experimental sessions. Driving performance and secondary task performance measures were collected along with drivers' estimates of performance on the various tasks during each session. A significant decrease in the dual-task decrement observed in secondary task with greater exposure was found; however, dual-task decrements in driving performance were not seen in most measures. In general, drivers' estimated dual-task decrements tended to be greater than their actual dual-task decrements, and this was especially true in the stop light task where performance estimates became increasingly inaccurate with greater exposure. The impact of under and overestimating distracted driving ability on driving behavior and safety are discussed along with the possible role of feedback in improving the accuracy of estimates.

Pagination: 14p

Authors: Kidd, David; Horrey, William J

Corporate Authors: Transportation Research Board

Publication Date: 2009

Conference: Transportation Research Board 88th Annual Meeting

Index Terms: Age; Automobile drivers; Automobile drivers' tests; Behavior; Behaviour; Distraction; Driver tests; Driving; Driving tests; Highway safety; Human behavior; Motor vehicle handling; Multitasking; Perception; Road safety; Self evaluation; Task analysis; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|--|
| Title: | Combined effects of alcohol and distraction on driving performance |
| Full Text URL: | http://www.sciencedirect.com/science/a...S9C-2/2/d628b754f0c17d418702fd1879ec1214 |
| Abstract: | <p>Although alcohol and distraction are often cited as significant risk factors for traffic crashes, most research has considered them in isolation. It is therefore necessary to consider the interactions between alcohol and distraction impairment sources, especially when examining the relationship between behavior and crash risk. In a driving simulator, the primary goal was to maintain a safe headway to a lead vehicle and the secondary goal was to maintain stable lane position. All participants engaged in distractions that represented different levels of resource competition and half of the participants consumed alcohol (target BAC 0.08 g/dl). Specific comparisons were made between sober driving while distracted and driving intoxicated without distraction. Distraction tasks produced more changes in driving behavior than did alcohol for both longitudinal (primary) and lateral (secondary) driving goals. Alcohol impairment was evident only in relation to lateral driving performance, however there was an amplification of impairment when alcohol and distraction conditions were combined. Distraction resulted in a general level of impairment across all driving goals, whereas participants with alcohol appeared to shed secondary driving goals to "protect" primary driving goals. Drivers' strategies to cope with alcohol (and distraction) may not be sufficient to offset the increased crash risk.</p> |
| Pagination: | pp 1742-1749 |
| Authors: | Rakauskas, Michael E; Ward, Nicholas J; Boer, Erwin R; Bernat, Edward M; Cadwallader, Meredith; Patrick, Christopher J |
| Publication Date: | 2008/09 |
| Serial: | Accident Analysis & Prevention Volume: 40 Issue Number: 5 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575 |
| Index Terms: | Alcohol consumption; Alcohol use; Automobile driving simulators; Car following; Distraction; Driving; Driving simulators; Impaired drivers; Motor vehicle handling; Social drinking; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: A Decrease in Brain Activation Associated with Driving When Listening to Someone Speak

Abstract: Behavioral studies have shown that engaging in a secondary task, such as talking on a cellular telephone, disrupts driving performance. This study used functional magnetic resonance imaging (fMRI) to investigate the impact of concurrent auditory language comprehension on the brain activity associated with a simulated driving task. Participants steered a vehicle along a curving virtual road, either undisturbed or while listening to spoken sentences that they judged as true or false. The dual-task condition produced a significant deterioration in driving accuracy caused by the processing of the auditory sentences. At the same time, the parietal lobe activation associated with spatial processing in the undisturbed driving task decreased by 37% when participants concurrently listened to sentences. The findings show that language comprehension performed concurrently with driving draws mental resources away from the driving and produces deterioration in driving performance, even when it does not require holding or dialing a phone.

Pagination: pp 70-80

Authors: Just, Marcel Adam; Keller, Timothy A; Cynkar, Jacquelyn

Publication Date: 2008/04/18

Serial: Brain Research
Volume: 1205
Publisher: Elsevier Science Publishers BV
ISSN: 0006-8993

Index Terms: Automobile drivers; Brain; Cell phones; Cellular telephones; Conversation; Distraction; Driving; Listening; Magnetic resonance imaging; Motor vehicle handling; Neurology; Vehicle handling; Vehicle navigation

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Title: Factors influencing subjective ranking of driver distractions

Full Text URL: <http://www.sciencedirect.com/science/a...6Y8-1/2/f38c7741e9e8a9782dd710602731536c>

Abstract: Driver distraction is recognized as a significant cause of road traffic incidents. However, the more objective measurement and ranking of the relative importance of individual distractions in contributing to incidents tend to differ from subjectively-held rankings. To investigate this, the present study examines qualitative characteristics of 14 driver distractions to determine if these characteristics might explain the discrepancy. The conclusion is that for laypersons, qualitative characteristics, such as equity and familiarity, do contribute to their ranking of driver distractions. This poses some interesting issues for risk managers. For example, should safety interventions aimed at driver distractions be based purely on factual data and life-saving potential, or should they accommodate qualitative factors of salience to the public

Pagination: pp 392-395

Authors: Patel, Jayesh; Ball, David J; Jones, Huw

Publication Date: 2008/01

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 1
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Accident causes; Accident factors; Accident responsibility; Distraction; Drivers; Highway accidents; Motor vehicle operators; Ranking (Statistics); Risk management; Traffic accidents

Subject Areas: Data and Information Technology; Highways; Safety and Human Factors; I83: Accidents and the Human Factor

Distractions Outside the Vehicle

- Title:** Failures to Ignore Entirely Irrelevant Distractors: The Role of Load
- Abstract:** This article reports on a study of task distractions with applicability to automobile driving. The authors report on a series of experiments assessed interference effects from stimuli that are entirely unrelated to the current task, comparing the effects of perceptual load on task-irrelevant and task-relevant (response competing) distractors. Prior to this study, the most commonly used laboratory measures of distractibility (e.g., in the response-competition and attentional-capture paradigms), typically involve distractors that are task relevant (e.g., through response associations or location). The results from this study showed that an entirely irrelevant distractor can interfere with task performance to the same extent as a response-competing distractor. As with other types of distractors, the interfering effects of the irrelevant distractors can be eliminated with high perceptual load in the relevant task. The authors conclude that this new laboratory measure characterizes a form of distractibility common to everyday life and highlight load as an important factor of such distractibility.
- Pagination:** pp 73-83
- Authors:** Forster, Sophie; Lavie, Nilli
- Publication Date:** 2008/03
- Serial:** Journal of Experimental Psychology: Applied
Volume: 14
Issue Number: 1
Publisher: American Psychological Association
ISSN: 1086-898X
- Index Terms:** Activities of daily living; Attention; Attention lapses; Automobile driving; Distraction; Highway safety; Multitasking; Perception; Research; Road safety; Task analysis; Validity
- Subject Areas:** Highways; Safety and Human Factors; I83: Accidents and the Human Factor
-

Title: Attraction and Distraction of Attention with Roadside Advertisements

Full Text URL: <http://www.sciencedirect.com/science/a...0KV-1/1/34cba680afd9401b1881747b90bd8004>

Abstract: The optimum positioning of roadside advertisements is recognized by the industry as an important factor in attracting the attention of passing drivers. Less acknowledged is the possibility that the location of an advertisement may distract attention from vital driving-related information. This study compared street-level advertisements (SLAs; predominantly bus shelters) with raised-level advertisements (RLAs) of the same size that were suspended 3 m above the ground, on their ability to attract attention under different task conditions. Participants were split into two groups and watched video clips of driving, rating them for hazardousness while their eye movements were recorded. One of the groups was additionally primed to attend to advertisements. SLAs received the most fixations when participants were solely looking for hazards, and the fewest fixations when primed to look for advertisements. Though SLAs also had longer fixations than the RLAs, they were more poorly recognized in a subsequent memory test. We conclude that SLAs attract and hold attention at inappropriate times compared to raised-level advertisements.

Pagination: pp 671-677

Authors: Crundall, David; Van Loon, Editha; Underwood, Geoffrey

Publication Date: 2006/07

Serial: Accident Analysis & Prevention
Volume: 38
Issue Number: 4
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Attention; Billboards; Distraction; Drivers; Driving; Eye movements; Human subject testing; Motor vehicle handling; Motor vehicle operators; Outdoor advertising; Roadside advertising; Vehicle handling; Vehicle navigation

Subject Areas: Design; Highways; Safety and Human Factors; I82: Accidents and Transport Infrastructure; I83: Accidents and the Human Factor

| | |
|---------------------------|---|
| Title: | Contributing Factors to Run-Off-Road Crashes and Near-Crashes ♦ |
| Full Text URL: | http://www.nhtsa.dot.gov/staticfiles/D...a/PDFs/Crash%20Avoidance/2009/811079.pdf |
| Abstract: | <p>The purpose of this investigation is to identify factors associated with run-off-road (ROR) crashes. Events from the 100-Car Naturalistic Driving Study that constituted ROR crash or near-crash events were investigated to identify conditions in which the events occurred and contributing factors. ROR events occur more frequently per mile in low-visibility (including darkness) and low-friction conditions than in clear and dry conditions. Approximately half of the events (56%) occurred on straight roadways, with the remainder occurring in curves (30%) and intersection turns (14%). The most frequently identified contributing factor among the ROR events was distraction. Changes in roadway boundaries (e.g., discontinuities) also appear to be a common factor. Short following distances appear to be more commonly a factor than lead-vehicle braking. Other factors include fatigue/impairment, low friction, vehicle encroaching on the subject vehicle, low-speed maneuvering errors, and late route selection.</p> |
| Pagination: | 68p |
| Authors: | McLaughlin, Shane B; Hankey, Jonathan M; Klauer, Sheila G; Dingus, Thomas A |
| Corporate Authors: | Virginia Polytechnic Institute and State University, Blacksburg National Highway Traffic Safety Administration |
| Publication Date: | 2009/01 |
| Index Terms: | Accident investigation; Bends (Roads); Cross roads; Distraction; Fatigue (Biology); Fatigue (Physiological condition); Highway accidents; Highway curves; Human factors in accidents; Impaired drivers; Intersections; Junctions (Traffic); Ran off road accidents; Road curves; Roadway departure accidents; Running off roadway; Traffic accidents; Traffic safety |
| Subject Areas: | Highways; Safety and Human Factors; I81: Accident Statistics |

| | |
|---------------------------|---|
| Title: | Driver Distraction Injury Prevention Countermeasures--Part 1: Data Collection, Legislation and Enforcement, Vehicle Fleet Measurement, and Driver Licensing |
| Abstract: | This chapter discusses countermeasure options for preventing and mitigating the effects of driver distraction. The recommendations derive from the entire body of material reviewed in this book, from the authors' collective understanding of issues relevant to the topic, and from specific sources that provide some initial guidance in this area. The focus in this chapter will be on data collection, legislation and enforcement, vehicle fleet management, and driver licensing. |
| Pagination: | pp 533-557 |
| Authors: | Regan, Michael A; Young, Kristie L; Lee, John D |
| Corporate Authors: | CRC Press |
| ISBN: | 139780849374265 |
| Publication Date: | 2009 |
| Index Terms: | Accident causes; Accident factors; Accident responsibility; Attention lapses; Automobile drivers; Automobile driving; Countermeasures; Distracted drivers; Distraction; Driver licensing; Fleet management; Highway accidents; Highway safety; Injury prevention; Road safety; Traffic accidents |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

| | |
|---------------------------|---|
| Title: | Government and Industry Perspectives on Driver Distraction |
| Abstract: | There are many potential sources of distraction in the driving environment. Many are neither new nor technical in origin. Although some can be avoided, drivers have, to some extent, latitude in deciding where, when, and how to engage in potentially distracting activities. The development of effective countermeasures for preventing and mitigating the effects of distraction requires a concerted effort from multiple stakeholders in society, each of whom faces a different set of constraints in addressing the issue of distraction. With this in mind, the chapter discusses 3 complementary perspectives on the issue of driver distraction. |
| Pagination: | pp 603-618 |
| Authors: | Tingvall, Claes; Eckstein, Lutz; Hammer, Mike |
| Features: | Figures (1) ; References (22) |
| Corporate Authors: | CRC Press |
| ISBN: | 139780849374265 |
| Publication Date: | 2009 |
| Index Terms: | Accident causes; Accident factors; Accident responsibility; Attention lapses; Automobile drivers; Automobile driving; Countermeasures; Distracted drivers; Distraction; Highway accidents; Highway safety; Road safety; Traffic accidents |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

| | |
|--------------------------|---|
| Title: | Who's on the Line? Policing and Enforcing Laws Relating to Mobile Phone Use While Driving |
| Abstract: | This article investigates how laws relating to mobile phone use in cars are written, interpreted, and applied in real life. It explores how regulations are imposed, the difficulties that are encountered in terms of enforcement, and how laws have been policed and tested in court. By focusing on the socio-legal context in Victoria and drawing upon international comparisons, it is noted that stories of enforcement highlight the unique and particular questions asked of existing legal systems by motorists using a mobile phone. Moreover, in describing the problematic process of developing and implementing legal regulations, it is observed that road rules are struggling to adapt to a transitional technology and that there are significant obstacles to enforcing the laws. |
| Pagination: | pp 135-152 |
| Authors: | Jessop, G |
| Publication Date: | 2008/09 |
| Serial: | International Journal of Law, Crime and Justice Volume: 36 Issue Number: 3 Publisher: Elsevier ISSN: 1756-0616 |
| Index Terms: | Automobile driving; Cell phones; Cellular telephones; Distracted drivers; Traffic law enforcement; Traffic safety; Victoria (Australia) |
| Subject Areas: | Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: **Assessing the Variation of Driver Distraction with Experience—Phase I ♦**

Abstract: Driver distraction has been a major concern in highway safety s in the past. A driver is said to be distracted when one spends a longer time then required looking for something than attracts ones attention, thus leading to a deviation from the primary task of driving. The National Highway Traffic Highway Safety Administration (NHTSA0 estimates that 25% to 30% of all crashes are due to the various kinds of driver distraction. Driver distraction can either be due to on-road, in-vehicle factors or driver factors. Cell phones, Global Positioning Systems (GPS), stereo systems, conversations with other people in the vehicle, etc., include the major in-vehicle distraction factors, while billboards along the roadway and the traffic itself account for most of the on-road distraction factors. Driver physical and mental workload, fatigue, and age form the driver factors. It is evident from past research that an increased level of distraction or inattention of drivers leads to traffic crashes. The distraction or inattention levels vary from driver to driver. Fatality rates and age are said to follow a U-shaped function i.e., the fatality rates decrease as driver age increases and after a certain time the fatality rate start increasing.

Pagination: 10p

Authors: Martinelli, David; Medellin, Leonel; Akuraju, Nagaanupama

Corporate Authors: West Virginia University, Morgantown
West Virginia Department of Highways
Mid-Atlantic Universities Transportation Center

Publication Date: 2008/07

Index Terms: Age; Aged drivers; Cell phones; Cellular telephones; Distraction; Driver errors; Driver experience; Elderly drivers; Fatigue (Biology); Fatigue (Physiological condition); Global Positioning System; GPS; In-vehicle devices; Stereo systems (Automobiles)

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|---------------------------|--|
| Title: | What to Expect from California's New Hands-Free Law |
| Full Text URL: | http://www.ppic.org/content/pubs/op/OP_508JKOP.pdf |
| Abstract: | Beginning on July 1, 2008, drivers in California must use hands-free technology when talking on a mobile phone, and drivers under age 18 may not use a mobile phone at all while driving. This study examines how traffic fatalities, mobile phone ownership, and hands-free laws changed in states after a hands-free law was enacted, compared to states without a hands-free law. The findings indicate that mobile phone ownership is associated with higher traffic fatality rates in bad weather and on wet roads. The study anticipates that California's new law should lead to some 300 fewer traffic fatalities a year. This is based on the experience of three states (and Washington, D.C.) where similar laws are already in effect. The study also concludes that in order to gain the full benefit of the law, California should concentrate its enforcement efforts during adverse driving conditions, and public education about the law should be an important component in implementing the law. |
| Pagination: | 18p |
| Authors: | Kolko, Jed |
| Corporate Authors: | Public Policy Institute of California |
| Publication Date: | 2008 |
| Index Terms: | Automobile drivers; California; Cell phones; Cellular telephones; Distraction; Driving; Law enforcement; Laws and legislation; Motor vehicle handling; Vehicle handling; Vehicle navigation |
| Subject Areas: | Highways; Law; Safety and Human Factors; Security and Emergencies; I82: Accidents and Transport Infrastructure |

| | |
|--------------------------|--|
| Title: | Identifying the Traits of Aggressive and Distracted Drivers: A Hierarchical Trait Model Approach |
| Abstract: | Consumer misbehaviors that jeopardize others on the roadways include aggressive and distracted driving. This article reports on a study that focuses on the human element in driving misbehavior. The authors used the 3M Model of Motivation and Personality as a hierarchical model framework to identify a set of personality traits predictive of aggressive and distracted driving propensity. Used on a survey of college students, the results suggest that there are similarities and differences in the traits of aggressive and distracted drivers. The authors discuss their results in terms of strategies for developing persuasive communications aimed at reducing both forms of driving misbehavior. |
| Pagination: | pp 454-464 |
| Authors: | Bone, Sterling A; Mowen, John C |
| Publication Date: | 2006/09 |
| Serial: | Journal of Consumer Behavior Volume: 5 Issue Number: 5 |
| Index Terms: | 3M Model of Motivation and Personality; Aggression; Aggressiveness (Psychology); Automobile drivers; Automobile driving; Behavior; Behaviour; Consumer behavior; Distraction; Driving; Human behavior; Motivation; Motor vehicle handling; Personality; Safety education; Vehicle handling; Vehicle navigation |
| Subject Areas: | Education and Training; Highways; Safety and Human Factors; I83: Accidents and the Human Factor |

Title: Differences of drivers' reaction times according to age and mental workload

Full Text URL: <http://www.sciencedirect.com/science/a...S4J-1/1/81aed0cf86786625fc4ad4bb8e5d4a4a>

Abstract: This study was designed to examine differences in reaction times of drivers of various age groups and to assess the influence of mental workload on reaction times. Experiments were performed on a simulated street and under other conditions to identify drivers with long reaction times and drivers whose reaction times are affected strongly by mental workloads while driving on a public road. Reaction times after hearing a buzzer were measured under five conditions: (1) sitting in a stationary vehicle, (2) executing mental calculations in a stationary vehicle, (3) driving on a simulated street, (4) executing mental calculations while driving on a simulated street, and (5) driving on a public road. Subjects were 10 drivers each of three age groups. Each experiment was performed by these subjects under the five conditions. Results showed that mental calculations increased the average reaction time for each age group. Mental calculations increased differences among age groups and individuals, and increased differences in respective drivers' individual performance. Mental calculations influenced elderly drivers' reaction times remarkably. Results also demonstrated that an experiment on a simulated street identified drivers who showed long reaction times on a public road.

Pagination: pp. 567-575

Authors: Makishita, Hiroshi; Matsunaga, Katsuya

Publication Date: 2008/03

Serial: Accident Analysis & Prevention
Volume: 40
Issue Number: 2
Publisher: Elsevier
ISSN: 0001-4575
Serial URL: <http://www.sciencedirect.com/science/journal/00014575>

Index Terms: Age; Automobile driving simulators; Distraction; Drivers; Driving simulators; Mental workload; Motor vehicle operators; Reaction time

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|--|
| Title: | The impact of in-car displays on drivers in neighbouring cars: Survey and driving simulator experiment |
| Full Text URL: | http://www.sciencedirect.com/science/article/pii/S129f57ba94bcd7a851bb6699adc45a |
| Abstract: | <p>Legislation against drivers seeing an audiovisual display in their own vehicle does not prevent them from seeing audiovisual displays (such as those used with entertainment systems) in neighboring vehicles. Resulting cognitive and visual distraction is likely to impair driving, but research is lacking. We conducted a survey (N = 61) assessing whether drivers have seen and attended to audiovisual entertainment displays in other vehicles. In order to assess the effect of any such distraction on driving, we conducted a driving simulator experiment (N = 28) in which each participant completed drives under four conditions: (1) while a laptop computer positioned as if in a neighboring vehicle displayed no audiovisual entertainment materials; (2) while the laptop displayed entertainment materials, and given instructions to attend the materials; (3) while the laptop displayed entertainment materials, and given instructions to ignore the materials; (4) while the laptop displayed entertainment materials, and given no instructions. Thirty-one percent of survey respondents reported having ever seen an entertainment display. Amongst those who were driving at the time of last sighting, 87.5% reported having paid at least "a little" attention to the display. In the simulator experiment, drivers in the "attend" condition demonstrated lower mean speeds, lower variability in throttle input, greater variability in lane position on a curvy road section, and slower deceleration in response to a pedestrian, than those in the baseline condition. Results suggest that drivers pay attention to displays in neighboring vehicles and this may impair driving. The negative impacts of audiovisual displays as external-to-vehicle distractors might be reduced by design innovations, and legislation limiting visibility of audiovisual displays to the drivers of other vehicles should be considered.</p> |
| Pagination: | pp 137-146 |
| Authors: | Hatfield, Julie; Chamberlain, Timothy |
| Publication Date: | 2008/03 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 11 Issue Number: 2 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Automobile driving simulators; Distraction; Drivers; Driving simulators; Entertainment systems; Motor vehicle operators; Surveys |
| Subject Areas: | Highways; Safety and Human Factors; Vehicles and Equipment; I83: Accidents and the Human Factor; I91: Vehicle Design and Safety |

Title: **Distracting Miss Daisy**

Abstract: United States road safety is examined by the author. The author believes that drivers may actually be distracted by traffic signs, and that if fewer signs were posted roads would be less dangerous. Speed limit sign and stop sign effectiveness are examined, and the United Kingdom's traffic system's advantages are explored.

Pagination: 4p

Authors: Staddon, John

Publication Date: 2008

Serial: Atlantic Monthly
Volume: 302
Issue Number: 1
Publisher: Atlantic Monthly Group
ISSN: 1072-7825

Index Terms: Distraction; Drivers; Great Britain; Highway safety; Motor vehicle operators; Road safety; Signing; Signs; Speed signs; Stop signs; United Kingdom; United States

Subject Areas: Highways; Operations and Traffic Management; Safety and Human Factors; I73: Traffic Control; I83: Accidents and the Human Factor

Title: Memorandum Fuels Debate on Digital Billboards

Abstract: This article describes the debate over digital billboards and a memorandum issued by the Federal Highway Administration (FHWA) on the subject. Opponents of the billboards, which use light-emitting diodes to change messages in a matter of seconds, contend that they pose a threat to drivers who can be distracted by the changing messages. The FHWA memorandum was meant to provide standards for municipalities evaluating proposals for changeable electronic variable message signs. The memorandum is available at www.fhwa.dot.gov/realestate/offprmsgsgnguid.htm and it addresses five points: duration of each message displayed, transition time between messages, spacing between signs, locations, and brightness.

Pagination: p 1

Publication Date: 2007/12

Serial: Traffic Safety
Volume: 07
Issue Number: 12
Publisher: National Safety Council
ISSN: 0041-0721

Index Terms: Automobile driving; Billboards; Changeable message signs; Distraction; Dynamic message signs; LEDs; Light emitting diodes; Outdoor advertising; Roadside advertising; Traffic safety; Variable message signs

Subject Areas: Highways; Safety and Human Factors; I83: Accidents and the Human Factor

| | |
|--------------------------|---|
| Title: | Effects of route guidance variable message signs (VMS) on driver behaviour |
| Full Text URL: | http://www.sciencedirect.com/science/a...W5S-1/2/1ed0fbe938adcf402a5229169c44c03e |
| Full Text URL: | http://dx.doi.org/10.1016/j.trf.2007.03.003 |
| Abstract: | <p>Effects of route guidance variable message signs (VMS) on speed and route choice were investigated in a field study on two sites on motorways. Two VMS were used in the study, which displayed information about a closed road section downstream on the motorways and recommendations for alternative routes. Route choice, speed and braking behaviour were compared between vehicles approaching the VMS while they displayed messages and while they were left blank without message. There was high compliance with the messages on the VMS. About every fifth vehicle changed route choice according to the recommendation, and almost none drove as far as the closed road section. Speed measurements of 3342 vehicles showed large speed reductions, and video observations showed that large proportions of vehicles braked while approaching the VMS. The speed reductions and braking manoeuvres can partly be attributed to attention overload or distraction due to the information on the VMS. However, a proportion of the speed reductions was due to chain reactions where one vehicle braked and forced the following vehicles to brake or change lanes in order to avoid collisions. Safety problems may result directly from distraction, or indirectly from the reactions of the drivers to the distraction.</p> |
| Pagination: | pp 447-457 |
| Authors: | Erke, Alena; Sagberg, Friduly; Hagman, Rolf |
| Publication Date: | 2007/11 |
| Serial: | Transportation Research Part F: Traffic Psychology and Behaviour Volume: 10 Issue Number: 6 Publisher: Elsevier ISSN: 1369-8478 Serial URL: http://www.sciencedirect.com/science/journal/13698478 |
| Index Terms: | Attention; Behavior; Behaviour; Braking; Changeable message signs; Controlled access highways; Distraction; Drivers; Dynamic message signs; Field studies; Freeways; Human behavior; In vehicle route guidance; Motor vehicle operators; Motorways; Route choice; Route guidance; Route selection; Speed; Street closure; Variable message signs |
| Subject Areas: | Highways; Operations and Traffic Management; Safety and Human Factors; I73: Traffic Control |

Title: A Critical, Comprehensive Review of Two Studies Recently Released by the Outdoor Advertising Association of America ♦

Full Text URL: <http://www.scenic.org/pdfs/review.pdf>

Abstract: In July 2007, the Outdoor Advertising Association of America (OAAA) announced on its website the issuance of two "ground-breaking studies" that addressed the human factors and driver performance issues associated with real-world digital (or electronic) billboards (EBBs), and the impact of such billboards on traffic accidents. As a result of the issuance of these two studies and the claims made for them, and because of the need to address this technology by government agencies nationwide, the Maryland State Highway Administration requested an independent peer review of each of the two studies. This report represents the results of that review. These results indicate that acceptance of these reports as valid is inappropriate and unsupported by scientific data, and that ordinance or code changes based on their findings is ill advised.

Pagination: 31p

Authors: Wachtel, Jerry

Corporate Authors: The Veridian Group
Maryland State Highway Administration

Publication Date: 2007

Index Terms: Billboards; Drivers; Highway accidents; Highway safety; Human factors; Motor vehicle operators; Outdoor advertising; Peer review; Research reports; Road safety; Roadside advertising; Traffic accidents

Subject Areas: Highways; Safety and Human Factors; I80: Accident Studies; I83: Accidents and the Human Factor

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|--------------------------|--|
| Title: | A perceptual map for understanding concern about unsafe driving behaviours |
| Record URL: | http://www.sciencedirect.com/science/a...KG5-2/2/42ef3ecf87f4a3d17e0c271d832cad0a |
| Abstract: | <p>The objective of this paper is to develop a model that can help explain the public's level of concern associated with six dangerous driving behaviors (drinking and driving, speeding, distracted driving, using a cell phone while driving, fatigued or drowsy driving, and using illegal drugs while driving). Understanding the genesis of concern can be useful in addressing it and leveraging it to improve safe driving. Building on a risk perception model that was developed previously, the study investigated the relationship between the level of concern about the unsafe driving behaviors and the perceived level of concern of others about the dangerous driving behaviors, the perception of the prevalence of the dangerous driving behaviors, the perception of the level of risk imposed by these dangerous driving behaviors, and the perception of the severity of injuries that can result from them. Data from two independent samples were modeled using multidimensional scaling and logistic regression analysis. Both samples come from telephone surveys; one was administered to a random sample of 750 drivers in the province of Ontario, Canada in November 2006, the other to a random sample of 1201 drivers across Canada in September 2006. Two dimensions in particular were found to fit the data well: perceived risk and the perceived level of concern of others. The results from these analyses are summarized using a perceptual map. The relevance of such a map is illustrated by explaining the factors that impact levels of concern regarding several of the unsafe driving behaviors.</p> |
| Pagination: | pp 1667-1673 |
| Authors: | Vanlaar, Ward; Simpson, Herb; Robertson, Robyn |
| Publication Date: | 2008/09 |
| Serial: | <p>Accident Analysis & Prevention Volume: 40 Issue Number: 5 Publisher: Elsevier ISSN: 0001-4575 Serial URL: http://www.sciencedirect.com/science/journal/00014575</p> |
| Index Terms: | <p>Behavior; Behaviour; Canada; Cell phones; Cellular telephones; Distraction; Drivers; Driving; Driving under the influence; Driving while intoxicated; Drugged drivers; Drugged driving; Drunk driving; DUI; DWI; Fatigue (Biology); Fatigue (Physiological condition); Human behavior; Motor vehicle handling; Motor vehicle operators; Multidimensional scaling; Overspeed; Perceptual map; Regression; Regression analysis; Risk perception; Speeding; Surveys; Vehicle handling; Vehicle navigation</p> |
| Subject Areas: | Data and Information Technology; Highways; Safety and Human Factors; I83: Accidents and the Human Factor |