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Summer 2008

Liberty Mutual Research Institute for Safety

**Driver Distraction
Takes a Front Seat
in Roadway
Safety Concerns**

**Liberty Mutual
Scientists Explore
Behavioral Side
of Driver Distraction**

**Taking Action Against Distraction:
How Employers Can Minimize the Risk**

Vol. 11 No. 2

Driver Distraction Takes a Front Seat in Roadway Safety Concerns

In today's fast-paced world, it is increasingly common to see drivers talking, dialing, text messaging, or reading – while driving. And while the productivity benefits offered by these activities attract drivers and employers, the research shows that adding a secondary activity to the primary driving task is risky.

For example, a landmark study conducted by Virginia Tech Transportation Institute (VTTI) found that driver inattention is the leading factor in most crashes and near crashes. The study used in-vehicle video and sensor technologies to track the behavior of the drivers of 100 vehicles for more than a year. The findings indicated that nearly 80 percent of all crashes and 65 percent of all near crashes involved driver inattention within three seconds of the onset of the conflict. The primary causes of driver inattention were distracting activities, such as cell phone use, or drowsiness. The study also found that drivers who frequently engaged in distracting activities were more likely to experience an inattention-related crash or near crash.

While the 100-car study findings shed valuable light on the problem of distracted driving, researchers are still struggling to understand the precise role of in-vehicle distractions in crash causation. "It is extremely difficult to prove whether or not distraction caused a crash," explains Joseph Kianianthra, Ph.D., recently retired associate administrator of research at the National Highway Traffic Safety Administration. Recent studies that examine the role of cell phone activity in crash causation illustrate the point. One such study, conducted in Canada, examined crash data and phone records to identify whether people were on the phone during the time of crash. The results indicated that drivers who used a cell phone

while driving were four times more likely to be involved in a crash. "The study findings link cell phone use to crashes, but it is guilt by association," states Kianianthra, who explains that even if the driver was on the cell phone, we cannot be sure that it was that activity that caused the crash. Other studies which use police records to determine the role of cell phones in vehicle crashes tend to underestimate the impact of distraction. "Many drivers do not want to admit they were using a cell phone or engaging in any distracting activity at the time of a crash."

Despite difficulty determining the increased risk of distracted driving, transportation researchers agree on one critical fact: engaging in distracting practices while driving impairs driving performance. Motivated by this knowledge, and the understanding that today's drivers face more potential in-vehicle distractions than ever, Liberty Mutual scientists are approaching the problem of driver distraction from a different angle. "We are taking the research to the next level to examine when, and under what conditions, drivers switch their attention away from the driving task," states Ian Noy, Ph.D., director of the Liberty Mutual Research Institute for Safety. "By better understanding the perceptions and thought processes that underlie attention-related decisions, we will be able to identify strategies to lessen the impact of driver distraction and improve roadway safety."



What Is Distracted Driving?

What do a road map, cell phone, and soft drink have in common? Each can be a potential trigger for in-vehicle driver distraction, a growing problem in the US and other industrialized countries. It is a problem that affects everybody on the roadways – from everyday drivers and commuters, to those who drive as part of their job responsibilities. But what exactly is driver distraction?

“Any time a compelling object or activity diverts a driver’s attention from the primary driving tasks – vehicle control, navigation, and hazard detection – that’s driver distraction,” states William Horrey, Ph.D., a behavioral research scientist at the Research Institute. “Broadly speaking, distractions can occur both within and outside of the vehicle. However, most research focuses on in-vehicle distractions because these are usually in the driver’s control and therefore offer the most promise for safety intervention.” According to Horrey, most in-vehicle distractions can be broken down into three types: visual, manual, and cognitive.

- Visual distractions – such as reading a text message, glancing down to find an object, or navigating a road map while driving – cause the driver to look away from the road. Even just a few seconds of inattention can cause the driver to miss an upcoming hazard and/or lose control of the vehicle.
- Manual distractions – such as holding a cell phone, adjusting in-vehicle controls, or reaching for an object (like a soft drink can rolling on the floor) – cause the driver to take a hand off the steering wheel, which can also result in loss of vehicle control.
- Cognitive distractions – such as having to make business decisions during a cell phone conversation, thinking about routing options, or even worrying about that rolling soft drink can while driving – cause drivers to take their minds off the driving task. These distractions can create inattentive blindness. That is when the driver is looking at, but not seeing a potential hazard.

“Certainly there is overlap among these three categories of distraction,” says Horrey, citing cell phone dialing as an activity which can involve cognitive, visual, and manual distraction. “But the main point is that researchers have linked all three types of distractions to degraded driving performance.”

Of course, the road map, cell phone, and soft drink can be by no means the only triggers for driver distraction. The list includes a vast array of potential distractors – from car radios, climate control devices, and passengers to CD players, menu-driven PDAs, and on-board navigation systems. “In the early days, some people were concerned about the distracting effects of listening to music or turning dials while driving, and we have adapted to these practices to a certain degree,” says Horrey. “However today, the sheer number of competing and more complex in-vehicle distractions and their increasing use among everyday and commercial drivers is cause for great concern.”

Cell Phones and Driving Performance: Closing the Research Gap



Over the past decade, the number of cell phone subscribers in the US has increased dramatically, from 33.8 million in 1995 to 255.4 million in 2007 (Cellular Telecommunications Industry Association, 2008). As cell phone use has increased, so have the number of studies into the negative safety implications of their use while driving.

While most studies show a negative impact of cell phone use on driving performance, differences in methodologies, populations studied, experimental protocols, and dependent measures have produced differing estimates of the effects. For example, a 1991 field study conducted in the Netherlands showed that under some conditions drivers exhibited decreased lane deviations while performing a cell phone task, whereas other studies have failed to replicate these results. Likewise, several studies have shown that people exhibit increased response times on various perceptual and cognitive tasks while engaged in cell phone conversations, while others have shown no such increase.

To address these inconsistencies, researchers at the University of Illinois conducted a meta-analysis of 23 separate studies of the impact of cell phone conversations on driving. Using this methodology they combined the results of a group of studies addressing a single hypothesis to estimate the reliability and magnitude of the hypothesized effect. In this case, the researchers focused on the effect of degradation of driving performance during cell phone use.

Overall, the results showed that cell phone use while driving *did* degrade driving performance. In particular, the measure most affected was driver reaction time. Smaller effects were found for lane-keeping performance. Hands-free and hand-held phones showed similar results for both performance measures; moreover, conversation tasks tended to show greater performance decrements than did information processing tasks. In addition there were some small differences between simulator and field studies, although both indicated performance decrements due to cell phone use.

Based on the results of their analyses, the researchers concluded that there are significant performance decrements associated with cell phone use; that hands-free cell phones do not eliminate or substantially reduce these decrements; and that different research methodologies or performance measures may underestimate these decrements. The complete paper, "Examining the Impact of Cell Phone Conversations on Driving Using Meta-Analytic Techniques," by William Horrey, Ph.D., and Christopher D. Wickens, Ph.D., is published in *Human Factors*, Vol. 48, No. 1, Spring 2006.



100-Car Study Links Driver Inattention to Crashes

Reaching for a moving object	9 X
Looking at an external object	3.7 X
Reading	3 X
Applying makeup	3 X
Dialing a hand-held device (typically a cell phone)	3 X
Talking or listening on a hand-held device	1.3 X
Activity	Increased Risk of Crash

Findings from the 100-Car Naturalistic Driving Study, sponsored by the National Highway Traffic Safety Administration, Virginia Tech, Virginia Department of Transportation, and Virginia Transportation Research Council, showed a clear link between driver inattention and vehicle crashes.

According to the study findings, nearly 80 percent of all crashes and 65 percent of all near crashes involved driver inattention caused by distracting activities or drowsiness. Among the distracting activities cited, the most common was cell phones use, but other activities preceding a crash included talking, listening, reading, and applying makeup.

For more information on the 100-Car Study, as well as a link to the final published report, go to www.vtti.vt.edu.

Liberty Mutual Scientists Explore Behavioral Side of Driver Distraction

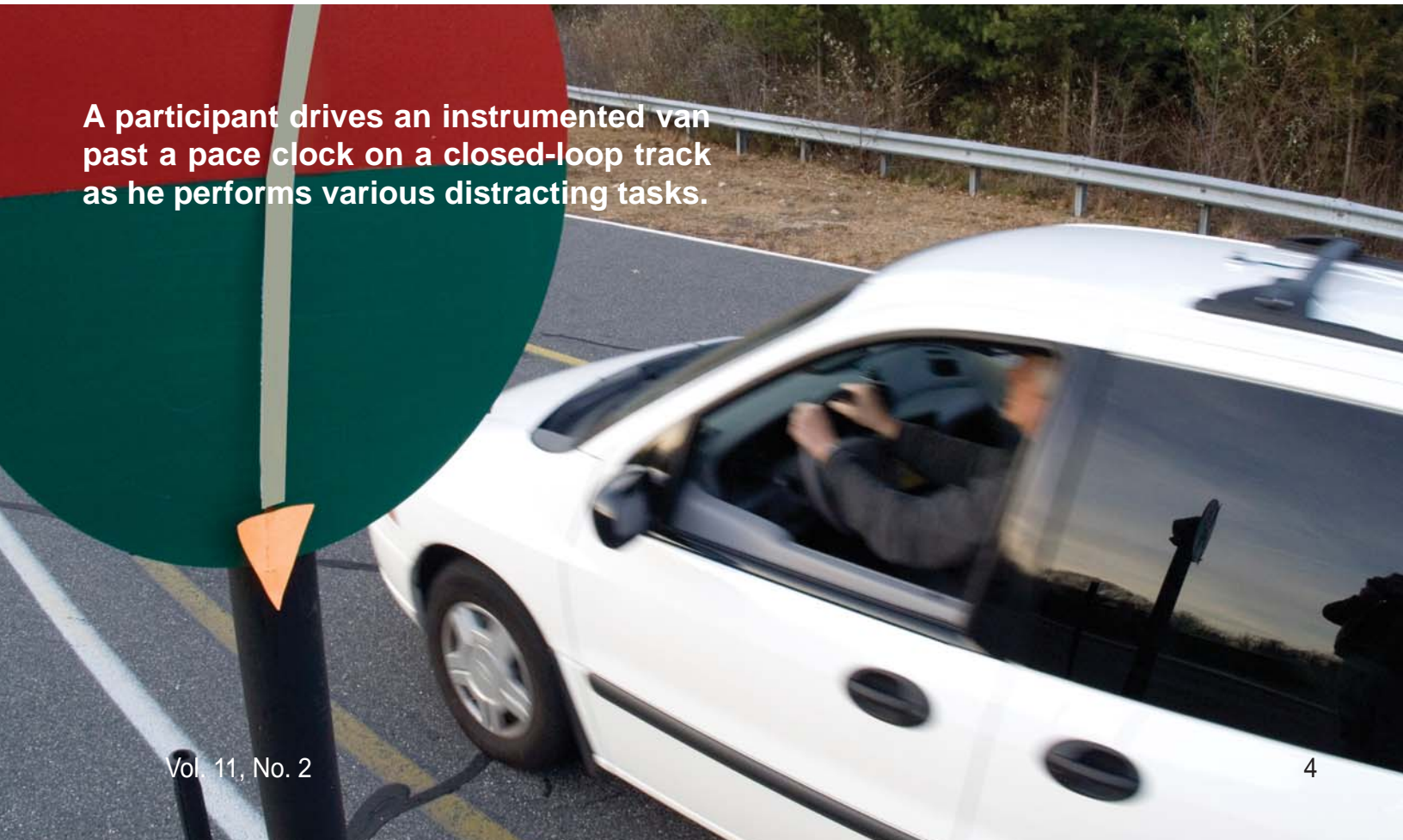
Engaging in distracting activities while driving is as much a part of modern life as watching TV or surfing the internet. Whether driving for work or for personal reasons, cell phones, on-board navigation systems, PDAs, and other in-vehicle telematics are now part of the everyday driving experience.

Despite research that highlights the negative impact of distraction on driving performance, people are increasingly exposed to in-vehicle technologies that can lead to distraction and degrade safety. To help find a solution, Liberty Mutual researchers realized they needed to get into the minds – and behaviors – of the drivers themselves.

As a first step, Liberty Mutual scientists set out to explore whether or not drivers are aware of the effects of in-vehicle distractions on their driving performance. In this controlled study, 40 drivers completed a series of cell phone tasks while driving around a test track. Pace clocks positioned throughout the course required drivers to carefully control their speed at various points,

and a traffic light periodically signaled drivers to come to a complete stop.

Drivers completed four separate trials – two involving driving while performing a task with a hand-held and hands-free cell phone, one trial of driving with no task, and a control trial, in which drivers performed the task while in a parked vehicle. For each trial, researchers recorded objective measures of lane keeping, speed control, and reaction time to traffic light changes. Between experimental trials, subjects provided subjective ratings of both their driving and task performance. Researchers then compared the objective and subjective data to assess drivers' awareness of their performance decrements related to the cell-phone tasks.

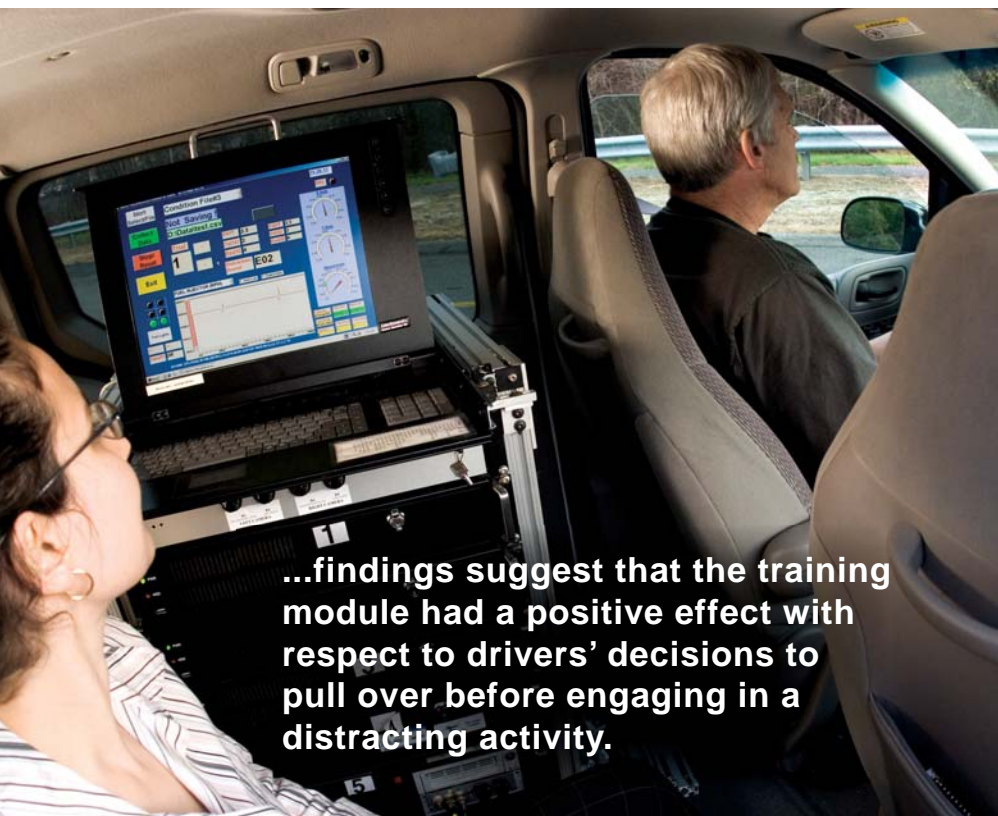
A photograph showing a white van driving on a road. In the foreground, a pace clock sign is visible, which is a vertical pole with a circular sign at the top. The sign is partially obscured by a large, semi-transparent graphic element consisting of a red and green circle. The van is moving from left to right across the frame. The background shows a road with a guardrail and some trees.

A participant drives an instrumented van past a pace clock on a closed-loop track as he performs various distracting tasks.

The findings, published in *Accident Analysis and Prevention*, (Vol. 40, pp. 675-682, 2008) indicated that, for the most part, drivers' subjective estimates of distraction did not correlate to the actual magnitude of the distraction. "This is not all bad news from a safety perspective, since it includes some drivers who may have overestimated the impact of distraction on their performance," states the study's principle investigator William Horrey, Ph.D. "However it's the people who underestimate the impact of the distraction that we need to worry about." In this study, younger male drivers (18-34 years) were particularly noteworthy. Among this group, subjective estimates of distraction were inversely related to actual distraction. "That means that younger male drivers that estimated the lowest distraction effects actually exhibited the largest effects on performance," explains Horrey.

how and when to initiate these tasks, provided they finished the task before a given deadline. During each trial, researchers recorded task initiation times, the associated levels of driving task demand, and whether drivers took action (such as pulling over) to reduce driving demands.

The study findings indicated that in most cases, drivers did not strategically postpone tasks even though they were fully aware of increasing road demands. Very rarely did drivers pull over to perform the in-vehicle activities (see chart next page). This finding was consistent across each task. Drivers tended to initiate a task regardless of the driving conditions and coordinated their task performance with the momentary demands of the road. This less-strategic form of adaptation frequently led to driving errors.



...findings suggest that the training module had a positive effect with respect to drivers' decisions to pull over before engaging in a distracting activity.

"The findings from these two studies suggest a need for greater driver awareness about the hazards of driving distracted. They also point to a need to find ways to help drivers adapt their behaviors and decision-making processes to mitigate that risk," notes Horrey. To begin to address these issues, Liberty Mutual research scientists recently began work on a third study that examines the effects of a training intervention on drivers' decisions of when, and how, to initiate distracting tasks.

For the study, researchers recruited 40 drivers between the ages of 18 and 20. In the first phase of the study participants completed a survey after viewing a series of short video clips. The survey assessed participants' willingness to perform distracting activities in the situation presented, perceptions of the risks involved, and history of engaging in such tasks in similar driving situations. After that, drivers were assigned to two groups. The first group received an interactive computer

In a related study, Liberty Mutual researchers explored whether drivers adapted their driving behaviors to manage the risk involved in self-initiated distractions. For this study, researchers observed 20 drivers as they navigated a closed-loop test track. The track was divided into seven sections of varying demands and difficulty. Drivers were asked to perform one of four in-vehicle tasks – talk on a phone, read a text message, find an address, or pick up an object on the floor – while driving. Drivers were free to decide

training module designed to communicate the hazards of distracted driving as well as techniques for dealing with distracting activities. The second group (the control) viewed a short video on an unrelated topic.

After completing the computer module or video, each group viewed a new series of videos and completed another survey to assess whether the training module had any immediate impact on willingness to engage in distracting tasks and/or risk perception of driver dis-

tractions. While the control group did not exhibit any changes in their willingness or risk ratings before and after viewing the video, the group that received training exhibited significant changes following completion of the training module. Notably, their self-reported willingness to perform distracting activities declined significantly following the module and their estimates of risk increased significantly.

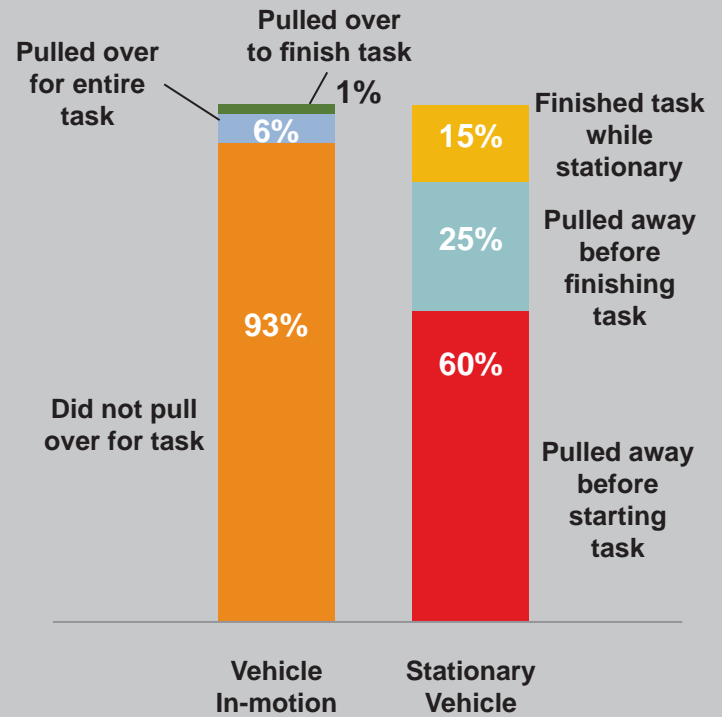
Finally, drivers from both groups were taken out onto the closed loop test track and asked to perform several in-vehicle tasks while driving under conditions of varying demand and difficulty. As in the earlier study, drivers were free to decide how and when to initiate these tasks. Researchers recorded task initiation times, the associated levels of driving task demand, and whether drivers took strategic action (such as pulling over or delaying task performance) to reduce driving demands.

Initial findings suggest that the training module had a positive effect with respect to drivers' decisions to pull over before engaging in a distracting activity. In fact, the trained group pulled over or stopped 18 percent of the time, as compared to 6 percent for the control group. But with respect to waiting until safer conditions for drivers that did not pull over, there was little difference between the trained and the untrained group.

While these findings indicate that training may have a positive impact on drivers' decisions to stop or pull over before engaging in distracting tasks, the research is still very preliminary. "We need more data to determine whether these findings translate to real world driving situations, or if the effects of such training would be long-lasting," states Horrey, who notes that the results from this study will inform future research on distracted driving interventions.

"In-vehicle technologies and other driver distractions are not going away. That's why it is important that we focus our research on the behavioral factors associated with distracted driving," states Horrey. "By increasing our understanding of the factors behind drivers decisions to engage in distracting activities, we can identify ways to mitigate the risks and improve roadway safety."

Comparison of driver task initiation while operating stationary and in-motion vehicles



When the vehicle is in motion (left-hand chart), the safest course of action is to pull over to perform a distracting in-vehicle task. However, our study showed drivers only did so in 7 percent of the trials. When the vehicle is stationary (right-hand chart), the safest option is to finish the distracting task before departing. In our sample, drivers pulled away before finishing the in-vehicle task 85 percent of the time.

Ahead of the times...

*One of the first studies to examine the impact of using a phone while driving was conducted in Cambridge, England, during the mid-1960s – before cell phones even existed. The study, "Interference Between Concurrent Tasks of Driving and Telephoning," published in the **Journal of Applied Psychology**, (Vol. 53, No. 5, pp. 419-424) concluded that telephoning has a minimal effect on the more automatic driving skills, but that perception and decision-making may be critically impaired by switching between visual and auditory inputs.*

Taking Action Against Distraction: How Employers Can Minimize the Risk

Each day millions of people take to the road as part of their job responsibilities. There are no data to suggest that these drivers engage in distracting activities any less than non-working drivers. On the contrary, long stretches of driving, work-related productivity demands, and use of in-vehicle technologies can create “the perfect storm” for driver distraction. Companies need to recognize the risks of distracted driving and take action to reduce that risk.

“On the one hand, professional drivers may be more aware of the dangers of distracted driving than the average driver,” says Dave Melton, director of Transportation Technical Services at the Liberty Mutual Research Institute for Safety. “On the other hand, it is easy for people who must drive as part of their job to want to increase their productivity by doing other tasks while driving. In some cases, employers expect their employees to use driving time as productive time. That’s a big danger since employees are led to think that driving doesn’t deserve their full attention ...but it does.”

Further fueling distraction are the increasingly sophisticated in-vehicle technologies being marketed to companies with the promise of increased productivity. “Cell phones, BlackBerries, PDAs, GPS navigation systems, internet accessing laptops – all of these de-

vices require that the driver take their attention away from the road,” says Melton. These products are attractive to companies that are constantly driven to increase productivity. At the same time, employers don’t want their drivers to be unsafe. “It’s a fine line between helping workers use their time productively and compromising safety,” notes Melton.

So, what are companies doing to navigate this fine line? According to Melton, many companies have implemented policies and procedures designed to restrict the use of certain in-vehicle devices while driving. For example, a company might have a policy that instructs employees to pull over out of traffic before placing a call or to keep conversations simple and concise. “These policies are good, but they need to be enforced properly,” states Melton. “If employees are told not to use the phone while driving, then every-



“Companies can’t afford to have their employees driving distracted... Think of it this way, nobody wants to see their company’s name in the paper after a tragic crash saying that their driver was on a conference call when the crash occurred.”

Dave Melton, Director, Transportation Technical Services
Liberty Mutual Research Institute for Safety



Three facts:

- **In-vehicle technologies are distracting**
- **Driving requires an employee's full attention**
- **Driving should not be combined with other work tasks**

one in the organization, including management needs to adhere to that policy. Otherwise, it sends a mixed message that ultimately influences the decisions employees make.”

“Some companies also require hands-free and voice-activated in-vehicle technologies. These are not a bad idea,” says Melton. “But they are certainly not a comprehensive solution.” Melton points out that while these devices reduce manual distraction, they do not address the bigger problem of cognitive distraction. Many studies have shown that complex business conversations and having to make decisions while driving increase the level of driver distraction. And despite voice activation features, drivers still tend to glance at visual interfaces to make sure the commands are being carried out properly. “This is a big problem, especially when there are competing visual interfaces from various in-vehicle technologies,” notes Melton.

“There is no silver bullet solution to the problem of driver distraction,” explains Melton. “Employers need to apply a multi-faceted approach to help reduce the associated risks.” As the cornerstone to this approach, companies must acknowledge three very simple facts: in-vehicle technologies are distracting; driving requires an employee's full attention; and driving should not be combined with other work tasks. “Companies can't afford to have their employees driving distracted,” explains Melton, who notes that every driving decision employees make can ultimately affect the company with respect to employee safety and losses associated with a vehicle crash. In addition, there is the company's good public standing to consider. “Think of it this way, nobody wants to see their company's name in the paper after a tragic crash saying that their driver was on a conference call when the crash occurred.”

10

Tips to Reduce On-the-Job In-Vehicle Driver Distractions

Here are 10 suggestions that companies can use to reduce the impact of in-vehicle distractions among employee drivers.

Establish and enforce policies requiring drivers to safely pull out of traffic when responding to or initiating e-mail, faxes, or other communications with devices that require key strokes.

Include the hazards of driver distraction as a topic during employee training, re-training, and indoctrination programs.

Install business-related technologies that utilize a display screen as close as possible to the driver's line of sight.

Prohibit the installation of video entertainment systems in vehicles that are used for company business.

Require and provide hands-free cell phone interfaces, even though hands-free devices do not mitigate driver distraction.

Purchase vehicles with technologies activated by voice recognition systems (including cell phones, navigation systems, etc.).

Deliver automated communications to drivers only when the vehicle is stopped, unless it is an emergency message.

When placing a call, employees should ask if the call recipient is driving and offer to call

back, especially if the call requires lengthy or complex discussion.

Require employees to inform callers when they are talking on a cell phone while driving.

Investigate to determine if driver distraction is a factor when crashes or near misses occur. Keep in mind that people often do not admit to performing a distracting task just prior to a vehicle crash.

*Advise employees to:

Adjust seat positions, climate controls, sound systems, and other devices while the vehicle is stopped.

If operating an unfamiliar vehicle, take time to learn how vehicle controls work. Use presets for radio and climate control.

Pull over and stop in a safe and secure place to eat or drink.

Read maps and check traffic conditions before leaving for a destination.

Let incoming calls bounce to voicemail for safe retrieval when the driving situation improves.

*Adapted from AAA Foundation for Traffic Safety, Distracted Driving Brochure. Full brochure available at www.aaafoundation.org.

Did you know...

- A vehicle traveling at 35 mph will travel more than 100 feet during a two-second glance to an in-vehicle display. This is 100 fewer feet in which a driver has to respond to a critical road hazard.
- For the 2008 model year, it is estimated that 80 percent of vehicle models will offer navigation systems as standard or optional equipment, 70 percent will offer Bluetooth interfaces, and 55 percent will offer touch-screen display interfaces (Telematics Research Group, 2007).
- At any given daylight moment, more than a million vehicles are driven by someone using a hand-held phone. (National Highway Traffic Safety Association, *Traffic Safety Facts*, June 2008).

NEWS

Liberty Mutual Research Institute Extends Management Team

The Research Institute welcomes Drs. Nils Fallentin and Marvin Dainoff as directors of two recently established centers: the Center for Physical Ergonomics (Fallentin) and the Center for Behavioral Sciences (Dainoff). "To position the Research Institute to address emerging needs in occupational injury prevention, we have organized our efforts into four research centers," says Dr. Ian Noy, director of the Research Institute. "Together with the existing Centers for Injury Epidemiology and Disability Research, these additional Centers will enhance our research capability and impact. While our mission remains the same, Nils and Marvin will play a critical role in developing new capacity and programs that will take us into the future."

As director of the Center for Physical Ergonomics, Dr. Fallentin and his team will explore new approaches to understanding physiological and biomechanical mechanisms of injury. The Center will improve the Research Institute's understanding of workplace exposures such as manual materials handling and slips, trips and falls, which together account for about half of the total burden of serious injuries. Dr. Fallentin joins the Research Institute from the National Research Centre for the Working Environment in Copenhagen, Denmark. He holds a M.Sc. from the Department of Exercise and Sports Sciences and a Ph.D. in Human Physiology from the August Krogh Institute – both located at the University of Copenhagen.

Dr. Dainoff will direct the Center for Behavioral Sciences, which will focus on the behavioral, cognitive, and organizational factors underlying workplace injuries and highway collisions. The Center's research will look at topics in risk communication, organizational safety climate, alternative work systems, and driver performance. Dr. Dainoff joins the Research Institute from Miami University, Ohio where he served as a professor of psychology, founding director of the Center for Ergonomic Research, and currently holds the position of Professor Emeritus. He received both his B.A. and Ph.D. in Psychology from the University of Rochester. Dr. Dainoff is a past president of the Human Factors

and Ergonomics Society and is currently serving as director on the Board of Certification in Professional Ergonomics.

"Nils has impressive credentials, both in terms of technical depth and management experience, and Marvin brings high-level perspectives in systems science, human-systems integration, cognitive engineering, and macroergonomics," continues Noy. "The experience and energy they bring to the Research Institute will complement and strengthen our research. We look forward to working with them to bolster our research program."



Drs. Marvin Dainoff and Nils Fallentin join the Research Institute as directors of the Centers for Behavioral Sciences and Physical Ergonomics, respectively.

Cifuentes Joins Center for Disability Research Staff



Dr. Cifuentes

relationships between patterns of medical care and outcomes in work-related injuries.

"I am pleased to join the staff," says Cifuentes. "The scientific output of the Institute is considered among the best in the occupational health field. My goal is to contribute to the scientific research with the same caliber and integrity as do my colleagues."

Manuel Cifuentes, M.D., M.P.H., Sc.D., recently joined the Research Institute as a research scientist with the Center for Disability Research. In this role, he will focus his efforts in the area of return-to-work research, including current investigations in healthcare management, medical utilization, and work disability. His research interests include occupational coding systems, workplace psychosocial factors, and the

Prior to accepting this position, Dr. Cifuentes completed a post-doctoral fellowship in occupational injury and disability research through the joint program between Liberty Mutual and the University of Massachusetts Lowell. As a Fellow at the Institute and University, his research focused on a variety of areas involving injury epidemiology, disability, return to work, medical utilization, and healthcare management. Before that, he contributed to a variety of occupational health-related projects as a research assistant at the University.

A native of Talcahuano, Chile, Dr. Cifuentes began his professional career as a general physician in private practice in Santiago. He also worked as a research consultant for the mental health unit at the Province of Concepción Health Service and the Chilean Ministry of Health, held a private clinical psychiatrist practice, and served as an assistant professor in the Public Health Department of the School of Medicine, University of Concepción-Chile. He received his M.D. from the University of Concepción-Chile, M.P.H. from the University of Chile, and his Sc.D. in Epidemiology from the University of Massachusetts Lowell.

Liberty Mutual and Ergonomics Society Name 'Best' Scientific Paper



Dr. Leclercq

A team of researchers from the French National Research and Safety Institute (INRS), Vandoeuvre, France, received the 2008 Liberty Mutual Award for their scientific paper, "Progress in Understanding Processes Underlying Occupational Accidents on the Level Based on Case Studies." The paper, published in *Ergonomics* (Vol. 50, No. 1, pp. 59-79, 2007), provides an in-depth analysis of "on-the-level" occupational accidents, that is, accidents triggered by an unexpected balance disturbance during work not performed at height, such as trips, slips, or falls on the level. The winning investigation was conducted by Sylvie Leclercq, Ph.D., and ergonomists Sandrine Thouy and Emmanuel Rossignol from the Working Life Department – Biomechanics and Ergonomics Laboratory at INRS.

"On-the-level accidents are a significant burden at both human and financial levels," says Dr. Leclercq. "This award encourages us in our research, which seeks to accurately characterize on-the-level accident scenarios with a goal of reducing these accidents. INRS and the authors are greatly honored by this recognition."

The Liberty Mutual Research Institute for Safety and the Ergonomics Society established the Liberty Mutual Award in 2005 to promote excellence in safety and health research. The award recognizes the paper published in *Ergonomics* over a given 12-month period that best contributes to the advancement of the practice of ergonomics.

Research on Supervisors' Role in Reducing Musculoskeletal Risks Wins Prestigious NORA Award

The Research Institute's scientific study, *Optimizing Supervisor Response to Workplace Injury*, won the 2008 National Occupational Research Agenda (NORA) Innovative Research Award. The collaborative study developed and tested a successful strategy for strengthening the role of supervisors in reducing workers' risk for work-related musculoskeletal injuries.

The winning project team members include William S. Shaw, Ph.D., Michelle Robertson, Ph.D., Santosh K. Verma, M.D., M.P.H., Glenn Pransky, M.D., M.Occ.H., and Mary Jane Woiszwilllo, B.A., all with the Liberty Mutual Research Institute for Safety; Robert McLellan, M.D., M.P.H., with Dartmouth-Hitchcock Medical Center; and Ronald Woo, with Liberty Mutual Insurance Company. The NORA Liaison Committee in cooperation with the National Institute for Occupational Safety and Health presented the award at the NORA Symposium held in Denver, Colorado, July 29, 2008

The NORA Innovative Research Award for Worker Health and Safety honors innovative and creative occupational health and safety research in a NORA priority area. The award recognizes the development of, or encourages continued work with, a new approach to prevent and/or reduce occupational illness and injuries. Eligible candidates may have an affiliation with a university, industry, government agency, labor union, or a private organization.

In the investigation, the researchers developed and tested a training program for supervisors. The program was designed to help workers recover from job-related musculoskeletal injuries, to help avert or reverse potential incipient injuries, and to prevent risks of new injuries. The training focused on the significant roles that supervisors can play by suggesting modifications in work demands, facilitating employees' access to health care, applying medical restrictions, addressing employee concerns and questions, and communicating concern and support for the employee's well-being.

The researchers evaluated the success of the training program by scientifically reviewing and comparing workers' compensation data from different parts of a food processing company. In the seven months after the training program introduction, the operating units in which supervisors had participated in the training program showed a 47 percent decline in the number of new workers' compensation claims for musculo-

skeletal injuries, compared with a 19 percent decline in other departments. In a subsequent evaluation after supervisors in the other department also participated in the training program, the two groups each showed an additional 19 percent decline in new claims.

"NIOSH is pleased to join in presenting this award, which recognizes creativity, ingenuity, and scientific know-how by the research team led by Dr. Shaw and his associates," said NIOSH Acting Director Christine Branche, Ph.D. "We applaud their leadership in developing this fresh approach to preventing painful, disabling, and costly occupational injuries, and in rigorously demonstrating its utility and value."



Dr. Shaw accepts NORA Award.

Recent Awards, Honors, and Distinctions

- Center for Disability Research Director Glenn S. Pransky, M.D., M.Occ.H., received the 2008 Robert A. Kehoe Award of Merit. The award, presented by the American College of Occupational Environmental Medicine, recognizes Dr. Pransky's significant contributions to the field of occupational and environmental medicine. In April, he accepted the honor at the opening session of the American Occupational Health Conference in New York City.
- Research Scientist William S. Shaw, Ph.D., P.E., presented the annual Norington Lecture at the 2008 Combined Australasian Faculty of Rehabilitation Medicine and Australasian Faculty of Occupational Medicine Annual Scientific Meeting. The invitational lecture, which outlines recent progress in allied health research, honors the achievements of the late Bradney William Norington, the first President of the Australian College of Rehabilitation Medicine. Dr. Shaw spoke on "Early Intervention and Workplace Injury," highlighting research-based evidence of the importance of early workplace intervention to help prevent long-term work absence and facilitate return to work. More than 600 physicians and allied health care professionals from Australia and New Zealand attended the Spring event in Adelaide, South Australia.
- Senior Research Scientist David A. Lombardi, Ph.D., received the Best Oral Presentation Award within the Occupational Safety Theme at the 9th World Conference on Injury Prevention and Safety Promotion. Dr. Lombardi presented findings from the study, "Weekly Working Hours and Risk of Work-Related Injury: U.S. National Health Interview Survey (1997 to 2004)." More than 1500 researchers, practitioners, and policy-makers attended the event in Merida, Mexico.
- The American Academy of Physician Assistants named Research Scientist Barbara S. Webster, B.S.P.T., P.A.-C., a Distinguished Fellow of the organization. AAPA bestows the honor to members that distinguish themselves among their peers, within their communities, and through their profession.

Advisory Board Visits the Research Institute



The Scientific Visitors Advisory Board recently convened at the Liberty Mutual Research Institute for Safety (LMRIS) to review the Institute's research programs and activities. The Board conducts periodic appraisals and produces a report based on their visit and discussions with researchers. Shown here with LMRIS staff are board members Barry Bloom, Ph.D., Harvard School of Public Health; Theodore K. Courtney, David Lombardi, LMRIS; Jean-Claude Andre, Ph.D., Centre National de la Recherche et de Scientifique; Cam Mustard, Ph.D., Institute for Work and Health; Ian Noy, Ph.D., Glenn Pransky, M.D., LMRIS; and Jorma Rantanen, International Commission on Occupational Health. Not pictured is Willem van Mechelen, M.D., Ph.D., VU University Medical Centre.

Annual Research Meeting of AcademyHealth : June 8 – 10, Washington, DC

- What Factors are Associated with Geographic Disparity in Early Opioid Prescribing for Acute Occupational Low Back Pain? – B.S. Webster, B.S.P.T., P.A.-C.
- The Association Between Timing and Duration of Chiropractic Care and Work-Disability Outcomes – R. Wasiak, Ph.D.

2nd International Conference on Applied Human Factors and Ergonomics: July 14 – 17, Las Vegas, NV

- A Novel Approach of Using a Portable Laser Scanner for Three-Dimensional Hand Anthropometric Measurement - C.C. Chang, Ph.D., C.P.E.
- A Cross-Cultural (China vs. U.S.) Comparison of Product Perceptions: Implications for Warning Processing – M.F. Lesch, Ph.D.
- Predicting Subjective Perceptions of Powered Tool Torque Reactions Based on Work Locations – J.H. Lin, Ph.D., C.P.E.

2008 McKenzie Conference of the Americas - Mechanical Diagnosis and Therapy (MDT): July 25 – 27, Orlando, FL

- From Pain to Function? The Impact of Opioid Prescribing on Outcomes for Acute Low Back Pain – B.S. Webster, B.S.P.T., P.A.-C.

12th World Congress on Pain: Aug. 17 – 22, Glasgow, Scotland

- Initial Consultation for Acute Low Back Pain: Impact of Psychosocial Factors on Provider and Patient Communication – W.S. Shaw, Ph.D., P.E.

4th International Conference on Traffic and Transport Psychology: Aug. 31 – Sept. 4, Washington, DC

- Adaptive Task Management for Driver-Initiated Distractions - W.J. Horrey, Ph.D.

3rd ICOH International Conference on Psychosocial Factors in the Workplace: Sept. 1 – 4, Quebec City, Canada

- The Back Disability Risk Questionnaire: Predicting Persistent Pain and Dysfunction – W.S. Shaw, Ph.D., P.E.
- Competencies of Return-to-Work Coordinators – G.S. Pransky, M.D., M.Occ.H.
- Measuring Return to Work – R. Wasiak, Ph.D.
- Durability of Employment Following Prolonged Work Absence – A.E. Young, Ph.D.

13th Annual Conference on Industrial Engineering Theory, Applications and Practice: Sept. 7-10; Las Vegas, NV

- Near-infrared Spectroscopy-Derived Circulatory Responses in Healthy Women Workers During Psychophysically-Determined Cart Pushing on Low and High Frictional Floors – R. Maikala, Ph.D.

Human Factors and Ergonomics Society 52nd Annual Meeting: Sept. 22 – 26, New York, NY

- Where and How College Students Use Their Laptop Computers – C.H. Chang, Sc.D., P.T.
- Factors Related to Drivers' Self-Reported Willingness to Engage in Distracting In-Vehicle Activities – W.J. Horrey, Ph.D.

Chang, W.R., Chang, C.C., Matz, S., and Lesch, M.F., "A Methodology to Quantify the Stochastic Distribution of Friction Coefficient Required for Level Walking," *Applied Ergonomics*, Vol. 39, pp. 766-771, 2008

Chang, W.R., Huang, Y.H., Li, K.W., Filiaggi, A., and Courtney, T.K., "Assessing Slipperiness in Fast-Food Restaurants in the USA Using Friction Variation, Friction Level and Perception Rating," *Applied Ergonomics*, Vol. 39, pp. 359-367, 2008

Ciriello, V.M., Dempsey, P.G., Maikala, R.V., and O'Brien, N.V., "Secular Changes in Psychophysically Determined Maximum Acceptable Weights and Forces Over Twenty Years for Male Industrial Workers," *Ergonomics*, Vol. 51, No. 5, pp. 593-601, 2008

DiDomenico, A.T. and Nussbaum, M.A., "Estimation of Forces Exerted by the Fingers Using Standardized Surface Electromyography from the Forearm," *Ergonomics*, Vol. 51, No. 6, pp. 858-871, 2008

Gatchel, R.J., Bernstein, D., Stowell, A.W., and Pransky, G.S., "Psychosocial Differences Between High-Risk Acute Versus Chronic Low Back Pain Patients," *Pain Practice*, Vol 8, No. 2, pp. 91-97, 2008

Horrey, W. J. and Wickens, C.D., "In-Vehicle Glance Durations: Distributions, Tails and a Model of Crash Risk," *Transportation Research Record*, Vol. 2018, pp. 22-28, 2008

Li, K.W., Chang, C.C., and Chang, W.R., "Slipping of the Foot on the Floor When Pulling a Pallet Truck," *Applied Ergonomics*, Vol. 39, pp. 812-819, 2008

Young, A.E., Wasiak, R., Webster, B.S., and Shayne, R., "Urban-Rural Differences in Work Disability After an Occupational Injury," *Scandinavian Journal of Work, Environment, and Health*, Vol. 34, No. 2, pp. 158-164, 2008



**Ian Noy, Ph.D.
Vice President
and Director**

Dear Readers,

In 2007, motor vehicle collisions accounted for 41,059 fatalities and roughly 2.5 million injuries in the US. Of these, work-related highway collisions account for approximately five percent of the serious occupational injury burden and cost industry more than \$2.0 billion in annual direct costs (2007 Liberty Mutual Workplace Safety Index). These statistics are sobering, and they point to a continued need for research focused on prevention.

Reducing the toll of highway crashes has been a Research Institute priority since the 1950s when we pioneered safety interventions such as seat belts and collapsible steering columns. Over the years, our work has shifted to crash avoidance research, where the focus is driver cognition and behavior. Why the change in focus? Because the scientific literature shows that driver error is a factor in about 80 percent of highway crashes.

Among the most prevalent underlying causes of driver error is driver distraction – the focus of this issue. It is a problem that has become magnified in recent years with the proliferation of cell phones and other in-vehicle technologies among both personal and professional drivers. Our research in this area has yielded new insights that will help identify ways to mitigate the associated risks and make our roads safer.

This issue also introduces Drs. Nils Fallentin and Marvin Dainoff, new directors of the Centers for Physical Ergonomics and Behavioral Sciences, respectively. We look forward to working with them to enhance our research program. I hope you will find this issue of our newsletter informative.

A handwritten signature in black ink that reads "Ian Noy". The signature is fluid and cursive.

from Research to Reality

**Liberty Mutual Research Institute for Safety
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From Research to Reality[®] is a publication of the Liberty Mutual Research Institute for Safety, an internationally recognized occupational safety and health research facility. Through its broad-based investigations, the Institute seeks to advance scientific, business-relevant knowledge in workplace and highway safety and work disability. The Institute's findings are published in the open, peer-reviewed literature and often serve as the basis for recommendations, guidelines, and interventions used by industry to help reduce workplace injury and related disability.

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