



Safety TG Newsletter

Human Factors and Ergonomics Society

Summer 2015

Contents

Letter from the TG Chair.....	1
Research Review: “Blue” Freeway Sign Logos Do Not Increase Driving Safety Risk.....	1
Pediatric Medications: Opportunities for Improvement.....	2
Teaching Teamwork: Crew Resource Management Successes and Failures	3
28TH Annual International Occupational Ergonomics and Safety Conference.....	4
Employment Opportunity: Cincinnati Children’s Hospital.....	4
Fall Newsletter Submissions and Deadlines ...	4
Newsletter Survey Results.....	5

From the TG Chair

by Nancy M Daraiseh PhD
Cincinnati Children’s Hospital Medical Center

It is an exciting time to be a part of human factors in safety. The widespread use of smartphones, tablets and web interfaces has familiarized the general public with the importance of effective user interfaces and also the pervasiveness of errors and their effects.

HFACS, MEDA and TEM, investigation and analysis tools developed to better understand human error in aviation, have expanded to other domains. The driving safety community, already actively studying the effects of distracted driving, is applying the lessons from aviation to better understand the effects of heads-down displays.

The medical community has begun to recognize the importance of human performance can have on patient safety, both in the OR and pharmacy.

And lessons learned, such as the importance of crew interactions and organizational influences, are increasingly present in accident reports and recovery plans. With this issue, we bring you a wide range of voices from our community.

This issue also benefits from the recent survey of TG members. First, we would like to thank the

almost one hundred members who provided feedback. We learned that many members are not aware of the newsletter, others had not been receiving it. Some members also expressed a hesitancy to contribute articles. (A summary of the findings is included on page five.) In response, we will establish a newsletter schedule, one in the spring, timed to highlight student accomplishments, and another in the fall, timed for release in advance of the annual HFES conference. We will also be soliciting material from students and early-career professionals to alert members of emerging research, and 'lessons learned' articles from experienced professionals to pass hard-learned lessons to the next generation. If you have an article or topic you would like to share, please contact the TG Chair or Newsletter Editor so it can be included in the next issue. We are also considering a LinkedIn Group as an additional communication forum. The TG blog (<http://stg.hfes.org/>) will continue to be available for articles, upcoming conferences, job posts, to recognize member accomplishments, and other items of interest.

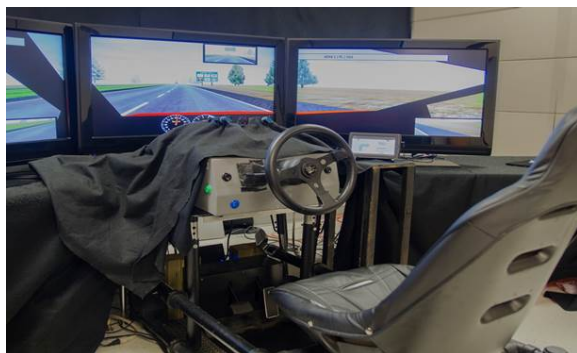
Research Review: More Logos on “Blue” Freeway Signs Does not Increase Driving Safety Risk

by the Edward P. Fitts Department of Industrial and Systems Engineering at North Carolina State University

Specific service logo signs on freeways notify drivers of food, gas, and lodging businesses at an upcoming interchange. Current regulations restrict the number of logos appearing on each sign to six, without justification for this limit. This restriction limits the number of businesses that can advertise at freeway interchanges as well as the amount of revenue that can be generated by state transportation departments as the demand for existing sign space can exceed six

businesses. A team of researchers at the Edward P. Fitts Department of Industrial and Systems Engineering at North Carolina State University, sponsored by the North Carolina Department of Transportation, has conducted two driving simulator studies (see photo) analyzing driver attention allocation and performance as impacted by nine panels on specific service signs versus the standard six panel signs. Both studies revealed that nine panel specific service signs required slightly greater attentional resources (higher fixation frequency and longer glance time); however, these differences in visual behavior were not statistically significant and did not translate to degraded driving performance (no increase in deviation from the center of the lane or deviation from speed limits). Furthermore, accuracy in searching the signs for a target business exceeded 97% across both sign types, with no significant differences between six panel and nine panel specific service signs. In general, the results of the two studies indicate that specific service logo signs can be expanded to nine panels without contributing to any decrease in driver safety as compared to current specific service sign design.

For further information on these students, please see the following journal publications:
Zhang, Y., Harris, E., Rogers, M., Kaber, D., Hummer, J., Rasdorf, W., and Hu, J., 2013, "Driver Distraction and Performance Effects of Highway Logo Sign Design," *Applied Ergonomics*, 44, 472-479.
Kaber, D., Pankok, Jr., C., Corbett, B., Ma, W., Hummer, J., and Rasdorf, W., 2015, "Driver Behavior in Use of Guide and Logo Signs Under Distraction and Complex Roadway Conditions," *Applied Ergonomics*, 47, 99-106.



Funding for this research was provided by the Transportation Mobility and Safety Branch of the North Carolina Department of Transportation (NCDOT). The opinions expressed are those of the authors and do not necessarily reflect the views of the NCDOT.

Pediatric Medications: Opportunities for Improvement

*by Kathleen E. Walsh, M.D, MSc
Cincinnati Children's Hospital Medical Center*

Children take more medication than most people realize: on average, one medication a week. Some children with chronic conditions, such as cancer or sickle cell disease, take four to ten daily prescription medicines. Giving children these medicines is highly complex, placing a tremendous burden on families. Beyond the usual difficulty of understanding bottle labels and use instruction, doses may vary from day to day and pills must be crushed or liquids measured. In visits to 144 children with chronic conditions at home, we found 133 errors in medication use including 13 which injured the children. We visited one child at home who took 13 tablets in a single dose of chemotherapy.

What can be done to help these families? Beyond a little common sense - 13 tablets or 3.75 milliliters of medicine are both very difficult to give - several opportunities exist to better support home medication use in children. Communication failures, measurement errors, and problems with medication labels are all opportunities for improvement.

In focus groups, parents report receiving different instructions about changes in medication doses from different clinic staff during a single visit. Parents report not always receiving a medication list with the current medication doses. Parents request consistent use of written materials to supplement verbal communication to ensure parents understand the correct dose of medication. This is particularly important when medication doses change- a vulnerable time for errors.

Many studies have highlighted the problem of errors in measurement of liquid medications. Although studies show that giving parents a measurement instrument, such as a syringe, and demonstrating the dose significantly reduces the rate of errors, this practice is not universal. Consistent implementation of this proven strategy would likely significantly reduce measurement errors at home.

Medication labels pose a difficult challenge for ambulatory medication safety. Many studies have shown that bottle labels cause confusion for patients. Some studies have developed and tested improved labels for patients with low health literacy. Among children with chronic conditions the bottle label is sometimes incorrect, due to frequent changes in medication doses. For example, children with epilepsy, cancer, or depression may take higher medication doses to increase effect or reduce doses due to toxicity. Incorrect labels cause errors where families follow the bottle label when it is incorrect or do not follow the label when it is correct. While a nurse in the hospital would never administer a medication with an incorrect label, we expect family members at home to do this all the time. A solution to this problem is sorely needed.

Home medication use in children is an area with many opportunities for re-engineering to reduce error. It is possible that solutions identified in the hospital may be applied to the home in some instances. In others, new solutions may need to be developed. Any proven solution that is widely adopted would reduce the burden for families of children with chronic conditions. As one mother said, "We are doing a lot of care at home, and 90% of the time there is no one there [except the family]. It's a lot of hands off. There needs to be more support because there are a lot of assumptions about what's going on at home."

Teaching Teamwork: Crew Resource Management Training Successes and Failures *by Alan Diehl*

On a clear evening in 1978 a United Airlines DC-8 was making an approach to Portland Oregon when its crew experienced a landing gear problem. They entered a holding pattern while collectively analyzing the situation. The captain then became fixated on troubleshooting the gear problem and ignored repeated hints from his two copilots about their low fuel status. Only after the jet's engines flamed out did he realize what had happened.

As the National Transportation Safety Board human factors investigator assigned to this crash, I decided to formally recommend crew resource management training (CRM) for airline

pilots. CRM promised to revolutionize the way airmen were trained. Because we previously had focused on teaching procedures and skills related to equipment operation, rather than critical behavioral issues associated with human decision-making. Note, the story of how CRM was launched is described in an excellent Discovery Channel "Mayday" episode: <https://www.youtube.com/watch?v=R5BmNfgC35Y>).

In 1981 I became the Federal Aviation Administration's senior human performance scientist, and eventually persuaded the agency to mandate CRM for all U.S. airline pilots. By the end of the 1980s most of the world's commercial pilots were also receiving CRM training. It was always apparent that CRM had applicability beyond pilots and it was soon given to flight attendants, mechanics, dispatchers and air traffic controllers. Many other arenas such as firefighting, nuclear power and medicine eventually adopted CRM training concepts.

In 1987 I became the Air Force Safety Center's senior technical advisor. After teaching the concepts to "Air Force One" crews, I attempted to convince the Pentagon's admirals and generals that CRM should be incorporated into all military training.

But in 1994 two U.S. Air Force fighter pilots, who had still not received CRM training, mis-identified two Army Black Hawks as Iraqi Hind helicopters. Furthermore, nearby USAF radar operators, failed to warn these pilots that those friendly helicopters were also operating in the area. The fighter pilots hastily launched missiles destroying both helicopters and killed 26 troops. I was assigned to the investigation and discovered that neither the fighter pilots nor the radar operators had received the recommended CRM training.

When the Pentagon ignored this information, I became a whistleblower. Time magazine broke this story in 1995 and I was contacted by Congressional investigators. However, the Pentagon still refused to fully embrace CRM and other tragedies followed, including the 1996 USAF Boeing 737 crash in Croatia, which killed Secretary of Commerce Ronald Brown and 34 others. My memoir, "Air Safety Investigators: Using Science to Save Lives -- One Crash at a

Time” (<http://youtu.be/FfLt6Alvh3g>), explains how CRM training might have prevented this and many other tragedies.

Note, I have spent over forty years on aviation ergonomics and training issues and have been a member of Human Factors & Ergonomics Society since 1968.

28TH Annual International Occupational Ergonomics and Safety Conference

The International Society for Occupational Ergonomics and Safety (ISOES) will be holding its XXVIIITH Annual International Conference on June 9-10, 2016 at the Radisson Hotel Chicago O’Hare. Join practitioners, researchers and students from various global industries and academic settings to collaborate and network at the 2016 ISOES Conference. Keynote presentations are featured as well as break-out sessions to fit the needs of those responsible for ergonomics and the safety of their workforce. Individuals interested in presenting their research/case study can submit an abstract of no more than 350-words in English to: Dr. Anand Subramanian at conference@isoes.info before March 4, 2016.

STUDENT PAPER SCHOLARSHIP: ISOES selects one student each year to receive a merit-scholarship waiver. The scholarship includes free conference registration, two nights at the conference hotel, and airfare to Chicago (up to a maximum of \$400). Candidates must be currently enrolled in an accredited university pursuing a degree with an ergonomics/safety focus. Selection decisions are made by the ISOES Executive Committee and are based on information provided in the ISOES Scholarship Application. The scholarship recipient will be expected to attend the ISOES conference and present their research. Undergraduate and Graduate students can apply to receive the student scholarship. For further information on the conference or the Student Paper Scholarship, please visit us at www.isoes.info

Employment Opportunity: Cincinnati Children’s Hospital

Cincinnati Children’s Hospital is currently recruiting a **Human Factors Consultant** to provide leadership and support the operations of patient safety through the application of expertise in human factors. This expert will assist with the design, planning and coordination of CCHMC’s *Safety Program*, which is focused on the prevention of patient and employee safety issues; and apply human factors methodologies to examine processes, workflow, environment, and other employee and patient safety related projects.

A full description of the position is available at www.cincinnatichildrens.org, Job ID# 78957. Candidates may also apply via this link.

Fall Newsletter Submissions and Deadlines

Suggested Topics: Current Research, Awards or accolades, Upcoming Conferences, Lessons Learned, Student Projects, or other topics you think would be of interest to the group. Suggested Format: 250-500 words with one picture or graphic. All submissions should be to the TG by September 15th for inclusion in the Fall (pre-conference) newsletter.

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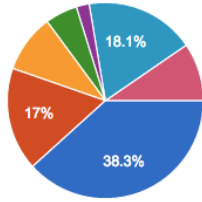
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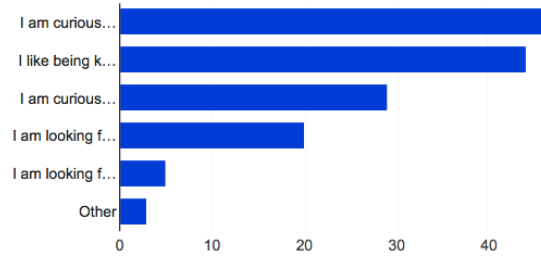
Safety TG Newsletter Survey Results

When the STG newsletter was distributed, did you read the newsletter?



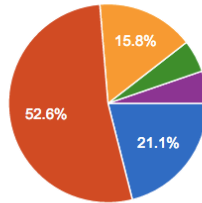
I regularly read the newsletter	36	38.3%
Sometimes I read the newsletter	16	17%
I would scan the newsletter occasionally	9	9.6%
I have read the newsletter once or twice	5	5.3%
I get the newsletter, but never read it	2	2.1%
There's a newsletter?	17	18.1%
Other	9	9.6%

Why do you read the newsletter?



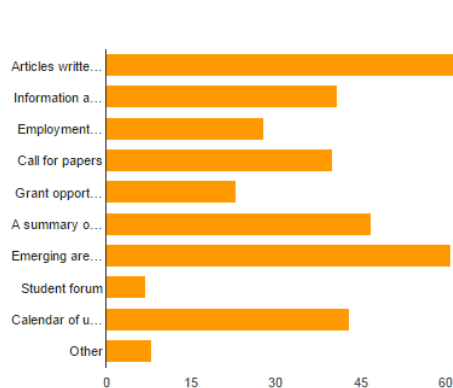
I am curious to learn about other research	47	69.1%
I like being kept up-to-date on HFES/Safety announcements	44	64.7%
I am curious about the state of affairs for the Technical Group	29	42.6%
I am looking for conferences and special editions of journals	20	29.4%
I am looking for employment	5	7.4%
Other	3	4.4%

Why don't you read the newsletter?



I have never received a newsletter	4	21.1%
I didn't know there was a newsletter	10	52.6%
I delete the newsletter, the topics are of no interest to me	3	15.8%
I save the newsletter to read later, but I never get around to reading it	1	5.3%
Other	1	5.3%

What would you like to see in the STG newsletter?



Articles written by leaders in the field	68	73.9%
Information about different industrial or research labs	41	44.6%
Employment opportunities	28	30.4%
Call for papers	40	43.5%
Grant opportunities	23	25%
A summary of the headlines in an email	47	51.1%
Emerging areas of interest	61	66.3%
Student forum	7	7.6%
Calendar of upcoming conferences and symposiums	43	46.7%
Other	8	8.7%



XXVIIITH Annual International Occupational Ergonomics and Safety Conference June 9-10, 2016 Chicago, Illinois, USA

The International Society for Occupational Ergonomics and Safety (ISOES) will be holding its XXVIIITH Annual International Conference on June 9-10, 2016 at the **Radisson Hotel Chicago O'Hare**.

Join practitioners, researchers and students for the 2016 ISOES Conference in Chicago, Illinois. Conference attendees includes global professionals from various industries and academic settings. Join practitioners, researchers and students collaborate and network at the 2016 ISOES Conference. Keynote presentations are featured as well as break-out sessions to fit the needs of those responsible for ergonomics and the safety of their workforce. Participants receive peer-reviewed publications that includes the latest research presented at the conference.

CALL FOR CONTRIBUTED PAPERS

Individuals interested in presenting their research/case study can submit an abstract of no more than 350-words in English to: Dr. Anand Subramanian at conference@isoes.info before **March 4, 2016**.

All abstracts submitted for publication in the Conference proceedings will be peer-reviewed by the International Program Advisory Committee. Authors will be notified of acceptance by **March 15, 2016**.

Full papers or extended abstracts and conference registration will be due by **April 15, 2016**. Papers for the conference will be published in the conference proceedings. Copies of the CD will be available to all conference participants.

FOCUS AREAS

◇ **Case Studies**

- Forensics
- Accidents
- Any area of related application

◇ **Cognitive Ergonomics**

- Human reliability
- Human-centered design
- Situational awareness

◇ **Construction**

- Design for Construction Safety
- Construction Safety
- Industrial Safety
- Construction Productivity

◇ **Management Issues**

- Standards development
- International ergonomic issues
- Accident prevention strategies

- Participatory ergonomics
- Performance/Personnel testing

◇ **New and Expanding Areas of Application**

- Military
- Transportation
- Health care
- Aging populations
- Research methods
- User-experienced designers

◇ **Training**

- Educational programs
- Ergonomics curricula development
- Macro-ergonomics
- Decision making

◇ **Technology Development**

- Human-computer interaction

- Computer-aided ergonomics
- New evaluation tools

◇ **Workplace Safety and Health**

- Design for health and safety
- Applications of engineering anthropometry, biomechanics, and work physiology
- Human factors in work measurement
- Manual materials handling
- Cumulative Trauma Disorders

◇ **Usability & Product Design**

- User Experience (UX) design
- Leading UX teams
- Universal usability
- Design research and concept evaluations

STUDENT PAPER SCHOLARSHIP

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Visit the International Society for Occupational Ergonomics and Safety Website at:
<http://www.isoes.info/>



International Society for
Occupational Ergonomics & Safety



Human Factor Consultant

Cincinnati Children's ranks third in the nation among all Honor Roll hospitals in *U.S. News & World Report's* 2015 Best Children's Hospitals ranking. This is the 5th consecutive year that Cincinnati Children's has been ranked among the top three pediatric hospitals in the US. Cincinnati Children's is ranked in the top 10 for all 10 pediatric specialties. We serve the medical needs of infants, children and adolescents with family-centered care, innovative research and outstanding teaching programs.

Cincinnati Children's is a national leader in a structured approach to healthcare quality improvement practices, which are guided by staff in the James M. Anderson Center for Health Systems Excellence. Work at the Anderson Center is focused on identifying opportunities for improvement, implementing improved practices, disseminating improved practices, and tracking the effects of interventions. <http://www.cincinnatichildrens.org/service/j/anderson-center/default/>

We are currently recruiting for a **Human Factors Consultant** to provide leadership and support the operations of patient safety through the application of expertise in human factors. Assist with the design, planning and coordination of CCHMC's *Safety Program*, which is focused on the prevention of patient and employee safety issues. To apply human factors methodologies to examine processes, workflow, environment, and other employee and patient safety related projects.

MAJOR DUTIES AND RESPONSIBILITIES:

1. **PROJECT OUTCOMES – SAFETY:** Achieve safety goals/aims as outlined in the Medical Center's strategic plan. Provide strategies/tactics/services related to human factors methodologies to examine processes, workflow, environment, culture and other employee and patient safety related projects.
2. **PROJECT MANAGEMENT:** Develop project plans, interventions and resources by integrating human factors methodology and research to achieve the visionary/strategic objectives of stakeholders. Incorporates active/effective decision making and problem solving. Maintain and monitor project work plans to support the successful achievement of local, divisional and organizational goals/aims.
3. **PROGRAM CONSULTATION:** Collaborate with others to plan or administer a specific program or service. Serve as an expert and internal resource to staff and/or physicians/faculty in regards to a specific aspect of the program or service. Assist in the design of program metrics and goals, and presents improvements to help reach these goals.
4. **RISK MITIGATION:** Recommend and coordinate error reduction efforts to minimize safety issues and risk within our healthcare system. Identify opportunities for improvement barriers to achieve stated outcomes, provide constructive suggestions for resolution and tracks the completion of all project issues
5. **REPORTING:** Develops progress/status reports to meet the needs of executive champions, key stakeholders and team members, includes progress to goal, status of deliverables, and risks/barriers to achieving goal/aim with recommendations.
6. **PLANNING:** Participate in short range planning and provide input to long range program planning as it relates to the implementation of the safety program. Identify and address barriers to the implementation of safety-enhancing practices.
7. **COLLABORATION:** Partner with facilities and leadership to integrate system design improvements using human factors engineering principles. Work collaboratively/cooperatively with others to achieve goals. Proactively adjust one's style and/or efforts to complement those of others. Develop positive working relationships with peers/colleagues. Share knowledge and/or provide support for team members. Contribute to and promote a positive and professional work environment/atmosphere.

Master's Degree in Human Factors Engineering or related field with 3 years related experience.

Healthcare-related experience preferred. PhD in healthcare/human factors engineering or related field preferred.

Qualified candidates may apply online via our career center website at www.cincinnatichildrens.org. Job ID# 78957.

CCHMC is an Equal Opportunity Employer. Qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, age, genetic information, physical or mental disability, military or veteran status, sexual orientation, or other protected status in accordance with applicable federal, state, and local laws and regulations.
