Safety TG Newsletter

Human Factors and Ergonomics Society
Fall 2015

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Letter from the Chair

Welcome to our Fall 2015 issue! I would like to begin by thanking all who contributed to the last and current issue of the Safety Technical Group newsletter. The newsletter had been out of circulation for some time but we believe it serves an important purpose to our group and with your help plan to keep it going! A special thank you goes to Noelle Brunelle our Newsletter Editor and Katie Berry at Fort Hills Group for keeping our website up to date. We look forward to hearing from our members about upcoming conferences, member accomplishments and awards, new job openings, and emerging research. And students… we want to hear from you!

In this issue we focus on this year's HFES Conference in Los Angeles by highlighting the Arnold M. Small Lecture and details of conference presentations in safety. We expect to have a great turnout from our safety colleagues. Please mark your calendars for our Annual Business meeting to be held on Wednesday, October 28 from 5:30-6:30pm. If you have any agenda items you would like to discuss please feel free to email me at nancy.daraiseh@cchmc.org. Currently our agenda consists of the following:

Review of 2014 Business Meeting Minutes
Financial Report
Discuss best use of existing funds
Report from the newsletter editor
Awards and member recognition
Membership building
Developing a Mission Statement
Open Forum

As part of the conference this year we are reviving an exciting initiative, the HFES Safety Technical Group Student Paper Award. Although an announcement was not made we decided to award two outstanding students for their contributions and plan to continue to do so. Read on to find out about the lucky winners!

I would like to end my message by strongly encouraging our members to participate in the STG activities and become more involved in our growth. Safety permeates our homes, our work, and our communities – local, regional, and global. Our members' work, education, and research improve lives and prevent injuries and deaths. So I urge you to submit ideas, articles, stories, and consider serving on one of the many positions in the STG. Incidentally our current STG has an immediate opening for a Secretary/Treasurer! On that note, I would like to remind everyone that in Spring 2016 we will be seeking nominations for the following positions:

Technical Group Chair Elect,
Program Chair Elect,
Secretary & Treasurer, and
Newsletter Editor

If you would like information about any of these positions please contact our current officers – they can be found at this years' annual meeting or at our website http://stg.hfes.org/officers/.

Safety TG at the Annual HFES Meeting

The Safety TG has a lively program for the 2015 Annual HFES Meeting. We have three sessions this year: Safety Practices and Applications (Tuesday the 27th from 1:30 to 3:00); Warnings and Risk Perceptions (Tuesday the 27th from 3:30 to 5:00) and the Arnold M. Small Lecture: Construction Safety and Health as a Leading Indicator, presented by Christine M. Branche of the National Institute of Occupational Safety and Health. We will also present two students with the Safety TG Best Paper Award during the Technical Group Meeting (Wednesday the 28th from 5:30 to 6:30pm). We look forward to seeing you there!

Congratulations to our Student Paper Winners!

This year the Safety Technical Group is proud to recognize the work of two students: Jessica Taylor of North Carolina State University and Andrew Abbate of Drexel University. Mr. Abbate's award will be presented during the Wednesday evening business meeting. Mrs. Taylor is unable to attend the meeting, and will be presented with her award separately.

Mrs. Taylor's paper, *Specific evacuation instructions enhance spoken fire warnings*, investigated the effectiveness of spoken word instructions during building fire alarms. She will present her work during the Warnings and Risk Perceptions session on Tuesday, October 27th from 3:30 to 5:00.

Jesseca Taylor is a doctoral student in the Psychology department at North Carolina State University (NCSU). Jessica's interest in consumer safety began as a teen while watching consumer safety investigation reports on television news programs. This interest evolved into a passion for human factors during her work as a software engineer at Lexmark International Inc. As a result, she shifted her career focus from writing efficient code to developing safe and easy-to-use systems and increasing consumers' knowledge on product safety. At NCSU, Jessica conducted research in Dr. Michael Wogalter's cognitive ergonomics lab for several years. Her research topics included risk perception, product safety, and visual and auditory warnings. Jessica has published seven research papers in peer-reviewed HFES conference proceedings and was the first author on four of those papers. Two of those published papers present results from studies on people's ratings of various fire evacuation warnings. In another study, she discussed the lack of awareness on internal tire aging and drivers' inability to decipher a tire code that indicates a tire's age. Ms. Taylor recently published a paper in the 19th Triennial Congress of the International Ergonomics Association proceedings demonstrating drivers' incorrect knowledge on how vehicle electronic key systems (VEKS) operate. Drivers may incorrectly assume vehicle ignitions are off and inadvertently leaving vehicles running in home garages, leading to carbon monoxide poisoning. When Ms. Taylor is not saving drivers from tire failures and carbon monoxide poisoning or building occupants from office fires, she enjoys reading research on attention and human-computer interaction and learning about user experience design.

Recently, Jessica was chosen to participate in a highly competitive user experience design summer internship at Fidelity Investments. During this internship, she conducted user studies to identify performance issues and obtain subjective experiences of participants using a website designed and developed by the intern team; and presented the results to Fidelity's user experience design organization. She holds a Master of Computer Science degree and a Master of Science in Psychology

from NCSU. One of Ms. Taylor's many goals/interests is to educate and recruit under-represented minorities to work in human factors.

Mr. Abbate's paper, *Using computational tree logic methods to analyze reachability in user documentation*, presents a reachability analysis approach that can be used to evaluate ease of navigation of existing and proposed checklists. He will present his work during the Warnings and Risk Perceptions session on Tuesday, October 27th from 3:30 to 5:00.

Andy Abbate is a Ph.D. candidate at Drexel University's College of Biomedical Engineering, Science and Health Systems. In his research,
Andy leverages computational tools to support the analysis of medical device user interfaces. To support patient safety, user interfaces must be easy for patients and caregivers to understand and use. The user manual is a critical part of the user interface, and its adequacy is vital to the operational safety of a medical device system. However, there are limited human factors engineering tools that support design and evaluation of user manuals.

Andy first became interested in the role that user manuals play in patient safety hazards during his first graduate research project, which required that he encode a formal task analytic model of a medical device troubleshooting procedure. He has since realized that an inadequate user manual can introduce problems with an otherwise adequate interface, and sometimes the concerns with user manuals can be so great that manufacturers recall their products. To fill the knowledge gap in user manual analysis methods, Andy is developing a model-based computational framework that includes methods for modeling the user's tasks, user manual content, external components such as controllers and cables, and internal device dynamics. With this work, he expects to support end-users and manufacturers in designing safer medical devices that treat user manuals as a critical part of the user interface and ultimately decrease use-related adverse events.

Human Factors Influence on Safety: Proposed 'Birds of a Feather'

Students want to learn how they, after they graduate and start working, can influence operational and workplace safety proactively (not have to wait for an injury to occur) within their company. Many students have co-op experiences in larger companies, and some of those companies have extensive safety programs and practices (such as Toyota). But if they have worked in a company that does not have much emphasis on safety, or they take a job at such a company, they are not sure what they could do to…. have an effect in the area of safety, even if it is not explicitly their job in the company

(most will be industrial engineer, process engineer, etc., not specifically working in a titled safety role)."

This question arose when students in an occupational safety course were asked what they wanted to learn during the semester that didn't appear on the syllabus. One young lady said that she'd worked for a large auto manufacturer that has extensive safety protocols and then worked for a company that didn't have much of anything and she personally practiced what she'd learned at the big auto company to help keep her safe at the second company. But she also felt that as a co-op she didn't have a way of having an impact on the practices of the second company. It may be that they think are one step removed when they are a co-op, or a new engineer. I can tell them about modeling behavior and making a solid business case for engineering controls, which involves using data, regarding making investments in safety, etc, but they also have to know whom to present their business case to and how to get their attention, etc. It would be helpful for them to hear directly from practitioners what is effective and what is not, since they will be out working soon.

A 'Birds of a Feather' group has been proposed for the 2015 meeting. If you would like to participate in this conversation, either in advance of or during the Annual Meeting, please contact Carolyn Sommerich (sommerich.1@osu.edu) or Noelle Brunelle (brunnoe@earthlink.net).

Arnold M. Small Lecture: History

I wanted to include a short bio of Arnold M. Small with the lecture announcement. I was surprised to learn one was not available, so I began researching on my own. I soon realized Mr. Small's history is a history of our society itself.

The field of human factors emerged during World War Two with the study of information presentation, detection and recognition; work station arrangement; required skills; and even control placement and shape on overall system performance. After the war, a number of centers were established to continue this work and ensure the operator was accommodated during system design. These included the Navy's Electronics Laboratory Human Factors Division (San Diego) led by Arnold M. Small. In 1952, the Department of Defense's Panel on Human Engineering recommended that the three service branches develop a Human Engineering Guide that could be applied to equipment design. Mr. Small chaired the committee that developed the guide, which was published in 1963 as the Human Engineering Guide to Equipment Design. As part of this effort, a fact-finding team visited the human factors offices of various aviation firms up and down the California coast. One consistent finding during these conversations was the need for a national human factors organization. Mr. Small was

one of the seven steering committee members that created the framework for what would become the Human Factors and Ergonomics Society.

This series is intended to honor Arnold M. Small with lectures that reflect the systems approach to safety that he pioneered. Past lecturers have included Gary Klein, Peter Hancock and Rebekah Salazar.

References

APA Division 21, M*embers who made distinguished contributions to Engineering Psychology*, edited by Henry L. Taylor, downloaded on 13 September 2015 from http://www.apadivisions.org/division-21/about/distinguished-contributions.pdf
Arnold Small Lecture, in *Human Factors and Ergonomics Society Bulletin*, 48(8) August 2005, downloaded on 14 September 2015 from https://www.hfes.org/web/BulletinPdf/0805bulletin.pdf
Human Factors and Ergonomics Society History, downloaded on 13 September 2015 from http://www.hfes.org/web/PubPages/HFES_History.pdf

Collaboration Opportunity: Training Decay

I recently joined HFES as I have relocated from Perth Western Australia to San Francisco California and would like to connect with like minded scholars and practitioners in HFE.I have 30 years experience as a safety and risk engineer and university engineering lecturer. I decided to study Human Factors because I became frustrated with not understanding how engineers can design plant, policies, processes and procedures which make it difficult for the workforce to safely construct, operate and maintain hazardous facilities.My research focus is measuring the risk perception of workers in hazardous industries. I have developed 3D virtual reality "serious games" to present hazardous situations and measured the difference in workers ability to recognize, avoid or tolerate them.I am interested in collaborating with members who are interested in exploring the decay rate of trained skills particularly for emergency response.

Tim McGrath
timmcgrath222@hotmail.com
+1 510 398 9466 (GMT -7 San Francisco Ca USA)

Upcoming Conferences

The International Driverless Cars Conference

5 to 6 November 2015
Adelaide, Australia
During this two-day event, technical experts, vehicle industry, research entities, legal groups and government agencies will gather to discuss the future of automated vehicles and future transport changes, including global research to support the trials and demonstrations planned for Australian delivery. Delegates will also have the opportunity to see the vehicles and automated vehicle technology in action on an off-road environment.
Further information is available at: http://www.dpti.sa.gov.au/driverlesscars

The 4th International Conference on Driver Distraction and Inattention

9 to 11 November 2015
Sydney, Australia
This conference will feature keynote speakers, plenary sessions, and presentations on theory, measurement, effects, crash risk and prevention/mitigation. The conference includes special symposia on current research and mitigation challenges, and brings together basic and applied research, the latest policy developments, priorities for research and countermeasure development - and more!
Further information is available at: http://www.ivvy.com/event/DD2015

2015 Arnold M. Small Lecture in Safety: Construction Safety and Health as a Leading Indicator

Christine M. Branche, National Institute of Occupational Safety and Health

The construction industry is always dynamic and serves as a key indicator of the health of the U.S. economy. Construction is also the industry that illustrates key crossroads for occupational health and safety. Construction leads other industries in innovative approaches based on STEM disciplines, including the application of nanotechnology. Yet, this sector also leads in U.S. work-related death rates. Branche will raise important issues with a focus on how to catalyze the momentum of this industry and address emerging safety and health challenges.

From July 2008 through August 2009, Branche was Acting Director of NIOSH. Upon joining NIOSH in 2007, she worked on the Energy Employees Occupational Illness Compensation Program Act of 2000 and its Advisory Board on Radiation and Worker Health. Prior to joining NIOSH, Christine was in the National Center for Injury Prevention and Control, first as an Epidemic Intelligence Service Officer and matriculating to the Director, Division of Unintentional Injury Prevention. Before coming to CDC, Christine worked extensively in occupational and environmental epidemiology. Her degrees include a BA in biology and an MSPH and PhD in epidemiology.

Summaries of 2015 HFES Annual Meeting Safety Session Papers

Session S1 – Safety Topics 1: Practices and Applications
Tuesday October 27th, 1:30pm to 3:00 pm

Store-related injuries to children and adults

by R. Kim, C. Crump, E. Harley, G. Nauhaus, & S. Vigit-Elliott

Data from the CPSC's National Electronic Injury Surveillance System (NEISS) was analyzed to explore the circumstances and patterns of injury experienced by adults and children in U.S. retail store environments during 2012. This presentation explores severity, injury type, accident mode and objects and conditions present during the accident.

Effects of context on performance times in residential roofing

by T. Akter & T. Smith-Jackson

Falls are the most serious causes of residential construction fatalities. This paper explores the use and enforcement of use of proper fall arrest systems (FAS) in residential roofing construction.

The angle of inclination of extension ladders: Field studies and labeling research

by E. Knox, & M. Van Bree

The inclination of a ladder is a critical step in the set-u process that influences 1) the potential for a ladder to slide out at the base, 2) the overall strength of the system, and 3) the biomechanics of the climber/user on the ladder. This research explores the effectiveness of existing ladder labels for setting the ladder at the correct angle of inclination.

A survey of expert elicitation practices for probabilistic risk assessment

by R. Boring

Expert opinions are sometimes required during risk and reliability analyses of human errors and hardware failures for which human performance or hardware operational data are not available. This paper reports the first phase of a research project to combine disparate formal methods of expert elicitation into a streamlined method.

Evaluating control room interface design and automation in petrochemical operations

by S. Schwartz, L. Ikuma, & C. Harvey

Recent studies suggest current petrochemical system interfaces are not supportive enough to inform console operators of potential issues. The current research sought to indentify current interface display limitations based on refinery visits and human factors research and models.

Session S2 – Safety Topics 2: Warnings and Risk Perceptions
Tuesday October 27th, 1:30pm to 3:00 pm

A call for updating the FHSA regulations with warnings research and to match ANSI 2535.4

by K. Nemire, & W. Vigilante, Jr.

The Federal Hazardous Substances Act (FHSA) regulations apply to many household products that may cause personal injury or illness as a result of customary or foreseeable use. This presentation utilizes a case study to explore the effectiveness of current standards, and recommends an update to current warning guidelines.

Formatting food labels for safety and health: Finding the ingredients faster

by J. Grishin, W. Walkington, &. M. Wogalter

Locating food product ingredient lists quickly can be important for consumers' health and safety. This study examines whether the relative physical placement of the ingredient list affects the time to locate it. Implications for improving food label safety will also be reviewed.

Using computational tree logic methods to analyze reachability in user documentation.

by A. Abbate, & E. Bass

Many safety-critical tasks, such as aircraft emergency checklists, are now available in PDF formats. This paper presents a reachability analysis approach that can be used to evaluate ease of navigation of existing and proposed checklists.

Specific evacuation instructions enhance spoken fire warnings

by J. Taylor, & M. Wogalter

Most building fire alarms are presented with non-verbal sounds, despite the availability of inexpensive and feasible voice presentation technology. This study examined wording effectiveness of spoken fire alarms.

Evaluating the public perceptions of landslide risks in the Himalayan Mandi town

by P. Chaturvedi, & V. Dutt

Detailed landslide hazard maps are available for several sections of the Himalayas. This research identified that many residents do not understand landslide causes, and risk awareness was not calibrated with actual threats. These finding suggest several barriers to landslide prevention activities.

Posters

Change in memory of emergency warnings: The case of an averted campus shooting

by D. Whitmer, M. Torres, & V. Sims

This research explored the effects of proximity to campus and gender on recall of emergency alert system warnings after an averted campus shooting. Gender effects on safety perception are also reviewed.

Aboveground swimming pool ladder safety: The application of child resistance to a consumer product used by children

by A. Mathias, & D. Brickman

Attempts to address the hazard posed by child access to above-ground pools through on-product warnings and instruction manuals have not been effective in stemming drownings. Making pool ladders child-resistant has the potential to greatly reduce this risk. This research studied child subjects to access a pool using various aboveground pool ladder designs.

Use of investigation models to explain accident causation and operator performance

by Barry Strauch

Accident models can affect the way investigators document and analyze investigation-related data. This paper describes several proposed accident investigation models.