

The FORVM

FORENSICS PROFESSIONAL GROUP
The HUMAN FACTORS and ERGONOMICS SOCIETY

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Chair's Page

In the last *The FORVM*, I posed some questions and received three responses. I found the comments to be most interesting, but rather than offer more of my own (except where noted), please let us know what *you* think. In the next issue, I will try to reconcile all of your comments with my concerns.

The responses are from George Widas, Vince Gallagher, and John Senders, each of whom I offer my thanks. My questions are included (sneaky way to lengthen the column) and our initials used to identify the author (RS for myself):

RS:

1. "Under what circumstances could the two experts arrive at opposite conclusions, i.e., provide contradictory answers to either lawyer's questions? This was much to the point of comments I offered in our newsletter a couple of years ago and found myself astonished at the acceptance in our work of 'biases' or 'point of view' ". [RS: I assumed that each expert would be working from the same "givens" and asked the same question; apparently my assumed "givens" weren't clearly given!]

GW: In response to the questions posed as related to differing and opposing experts' interpretations, opinions, and testimony, it is inconceivable that you would expect each and every qualified HF&E persons to perceive, interpret, and process the same information identically. We well know that no two persons will measure or act exactly that same as another. Further, being critical of another

professional's work in a forensic (defined as "for the sake of argument") environment is inherent in the process. "Idealistic" and "naïve" are concepts that enter ones mind when reading your queries.

VG: Two experts could arrive at opposite conclusions if there is conflicting testimony and each are asked to assume different facts. However, it should be clear from the reports of both experts what their assumptions are.

There may be insufficient scientific data to prove the theory of either expert. So they do their best to come to conclusions but really don't have a hard scientific basis to point one way or the other. They do the best that they can with what data there is.

[Some of this response also applies to question 3 (RS)] I think it's important not to "bad mouth" the other expert. We shouldn't "bad mouth" anybody if we don't have all of the information. Sometimes in litigation, one expert has been given other information by their attorney and that information is not known to the other guy. What might appear, without full knowledge, to be bias and opportunism may, upon learning all of the facts, be a valid position. In the past, I have thought another guy was being biased when I saw what their conclusions were. I think others probably have come to the same conclusion about me without having all of the information that I had available. I think it's extremely important not to judge the other guy unless we're sure we have all of the reasons why they hold the position that they do. However, there are opportunists and there are people without integrity in this business.

And the reasons why and how an expert can be "blinded" are quite interesting. Sometimes people are blinded by their ambition and greed and don't really "see" how their evaluation is biased. Sometimes I wish I could just sit down with the opposing expert and talk to see specifically how we could come to such different conclusions over a matter which to me seems so clear.

I think one of the most common ways that experts disagree over causation is by going out of step with the "hierarchy of controls". As we all know, Alphonse Chapanis told us: "To err is human. To forgive - design." That's the essence of the philosophy of safety engineering. That is, the behavioral controls are important only after exhausting feasible design techniques to eliminate or reduce the risk of injury. The most common reason for disagreement between experts is because one is going "out of step" with this philosophy. Then they argue that there is a "greater danger" associated with the proposed "fix". It seems to me that the burden then shifts to them to show why the safe design fix is really not a step forward and is indeed rather a step backward, that is, it will cause more injury.

There are legitimate disagreements over what is technologically feasible. But there shouldn't be any disagreement over the philosophy of hazard control or the fundamental philosophy underlying human factors, that is, that we should first design a safe workplace, tool, product, environment, etc. and then rely upon behavioral controls to further reduce those residual hazards which exist.

Probably one of the greatest reasons for human factors experts to go out of step with the hierarchy of controls is because they can make a lot of money if they simply blame the injured. Juries tend to believe that people shouldn't sue each other and should take responsibility for their own behavior. It's the job of a human factors expert to show that the unsafe behavior of the designer is a primary consideration and is sometimes the primary cause of injury.

JS: If they are fed different sets of facts they will almost surely arrive at different conclusions.

If they have been fed different education, they will almost surely arrive at different conclusions.

If they assign different values to mutually contradictory data in the literature, they will almost surely arrive at different conclusions.

If they are not equally logical or equally intelligent, they will almost surely arrive at different conclusions.

And, of course, if they slide from expert to advocate, they will almost surely arrive at different conclusions.

RS:

2. "What is the role or obligation of an expert whose lawyer client insists on presenting evidence that is based on data that violates Human Factors knowledge (e.g., using photographs to assert what should have been observed by a person)?"

VG: The role of the human factors expert is to be truthful and honest. If the lawyer that they work for insists on them presenting evidence that violates human factors knowledge, they should not go along. I think it's good business for both the human factors expert and the lawyer that he works for to deal with the truth. It is good business for attorneys not to bark up the wrong tree. It's quite expensive to bring a case to a jury. If you try to win on data that violates human factors, you should lose, if the opposing attorney is competent. Competency and integrity is really the only thing that the human factors expert should sell.

JS: I always tell prospective clients at the outset: That I prefer not to know whom they represent until I have given my first assessment, That even though they pay me I will work to assist the court on matters of fact; That even though they pay me I will tell the truth. That if they do not wish me to work for them on these terms I will cheerfully give them the names of persons who might be able to help them and at lower cost.

Lawyers may do and say what they like so long as they do NOT violate the rules of court. They are, by definition, not experts and what they say about evidence is NOT a fact; but an argument. Of course, if I am asked in direct or cross examination, under oath, whether the argument in question is sound I would answer truthfully to say that is or is not depending on whether it is or is not.

RS

3. "Given our code of ethics in which we do not "bad mouth" each other, what are our obligations to protect our collective reputations as scientists when we see a colleague commit egregious acts of poor scientific judgment (e.g., misquoting or misapplying research or principles)?"

JS: If my “learned friend” on the other side makes a statement which is incorrect it is my duty both to our profession and to my client to point this out if I am asked about it, and to educate the court in the process.

RS:

4. “What is ‘human error’ as opposed to design error?”

JS: Like all errors both are human and stem from the state of being human.

RS: “Often we hear that an accident is the result of human error (pilot error, etc.). The term connotes that the person did something wrong and is to blame for the accident.”

JS: That is not the common connotation of “human error” in the circles I travel in. Error, in my lexicon, presupposes intention. The failure to act as the actor intended is an ‘action error.’ To form the wrong intention is an ‘intention error.’ In neither case is blame automatically, or appropriately laid on the actor.

RS: “But we know that many of those accidents should not be “blamed” on the victim. How many times have we used the phrase, “it was an accident waiting to happen”.

JS: This sentence, in my view, confounds two quite different ideas. The “accident waiting to happen” is usually a system state that translates an error into an adverse outcome, such as a patient injury.” The error is a behavioral event; the accident is an engineering event.

RS: “Over the years I’ve adopted the view that human error is what results from willful disregard for rules (including procedures), performing while incapacitated by alcohol or illicit drugs, sabotage (error in moral judgment), and the like.”

JS: Willful disregard and sabotage are offenses ranging from simple negligence to murder. An error is, by definition and common usage unintended. Obviously if you knowingly intend to do something that will have an adverse outcome and do it you have not committed an action error or an intention error. You have committed, depending on the outcome, one of a list of possible criminal and/or civil offenses.

RS: “Everything else, including ‘forgetting’ and ‘making a mistake’, is design error since the design,

training, job aids, etc., could have been improved to prevent the accident.”

JS: “Forgetting” and “making a mistake” are behavioral events. A design that can translate an inevitable human error into an adverse outcome is a poor design.

RS: “The developers of the design, training, and job aids may be the ones to have committed human error, if “they should have known better”. “Because of the often unwarranted negative connotation of human error in the media, isn’t it up to human factors and other safety professionals to make a distinction between what is the fault or not the fault of someone who initiates an accident?”

JS: I quite agree but I think that your opening two paragraphs confound errors and their outcomes. It is precisely this confounding that leads the press and the courts to do the same. A consistent vocabulary would be beneficial in all HF forensic work.

I consistently try, with varying success, to educate judges, lawyers and juries to think of errors as Mental Acts of God (MAOG) since like all AOGs they are unpredictable, uncontrollable, and give no warning of their imminent occurrence. In their words people do not COMMIT errors; errors HAPPEN

RS: One of the Teuberisms offered to us by the late Hans-Lukas Teuber, founding chair of the MIT Psychology Dept., related to a book, cat, and a person falling off the roof of a building. The first could be described precisely by the physicist according to the “law of falling books”. The second is the domain of the physiologist who knows about reflexes and the “laws of falling cats”. The psychologist, in particular the clinical psychologist (of whom we appear to have very few, if any, in the HFES) tries to describe to us the “laws of falling people”. Just what scientific and “laws” do HF professionals rely on?

E-mail your thoughts on these, or any other issues, to rcspsibob@aol.com.

Bob Sugarman
FPG Chair

Announcements

New Mock Trial Released

The HFES Forensics Professional Group is pleased to announce the release of the new two-video set, "Mock Trial: Human Factors of Adaptive Cruise Control, Parts I & II." The mock trial, organized and chaired by HFES members Ian Noy and Alison Vredenburg, was presented during the International Ergonomics Association XIVth Triennial Congress/Human Factors and Ergonomics Society 44th Annual Meeting, held July 30-August 4, 2000, in San Diego, California.

This video, aimed at educating audiences concerning forensics, automobile safety, and human factors design issues, presents a fictitious case to demonstrate the human factors issues concerning an advanced automobile technology: adaptive cruise control (ACC). In this case, a collision occurred involving an ACC system. Design issues and user behavior are discussed. The first tape contains testimony from the plaintiff's expert, and the second tape includes testimony from the defense expert. Both tapes include commentary from participants who discuss key aspects of the litigation process.

The video will be useful in courses on law, human factors, safety, and industrial engineering/psychology. It is also appropriate for presentations to auto makers and attendees of professional meetings addressing vehicle safety or human factors/ergonomics design.

The presentation features Rudolf Mortimer as the plaintiff's expert and Kenneth R. Laughery, Sr., as the defense expert. Richard Hornick, David Thompson, and Richard Olsen are the commentators. Three practicing attorneys play the roles of plaintiff (Barbara Savaglio) and defense attorneys (Patricia Ryan) and presiding judge (James R. Spangler).

HFES members may purchase the set for \$60 plus \$7 shipping/handling; the nonmember price is \$110 plus \$12 shipping/handling (add \$5 to the shipping charges if mailed outside the U.S.; add sales tax if mailed to California addresses). The videos may also be rented for 15 days (\$30 members, \$50 nonmembers). To order, contact HFES at 310/394-1811, fax 310/394-2410, info@hfes.org.

2002 Annual Meeting Notes

By now, you should have received a preliminary registration packet for the HFES Annual

Meeting. The Forensics Professional Group has been allotted one paper session on Tuesday, October 1st at 1:00 P.M. Our Annual Business meeting will occur on Wednesday, October 2 from 3:30 to 4:30. We were successful in getting the business meeting scheduled at a different time from the Safety TG business meeting. So this year, you can come the Forensics TG meeting from 3:30 to 4:30 and then go to the Safety TG meeting from 4:30 to 5:30 P.M.

Book Review

Criminalistic and Forensic Biomechanics
By Viktor Porada and Jiri Straus
2001, 158 pages
Prague, Czech Republic: Police History Publishers
ISBN 80-86477-02-9
Reviewed by: Charles A. Cacha

Porada and Straus, biomechanists associated with the Police Academy of the Czech Republic in Prague, have written a book which has potential value for HFES forensic practitioners. Except for occasional idiomatic errors, the book is written in comprehensible English. The book contains 130 pages of text which include 50 well executed drawings, statistical tables, formulas and calculations. In addition there are 20 pages of references to the Czech biomechanics literature. It is not certain if this Czech literature is translated into English or not. The authors divided the book into two sections: 1) criminalistic aspects and 2) forensic aspects. The authors do not totally differentiate between these aspects however their subject matter might readily be used in this country for civil law or criminal law. Some areas which are covered are:

Footprint and Gait Analysis. The analysis of existing footprints, barefoot or soled, at a crime site may be analyzed to identify a group or specific individual by observing stride length, footprint configuration and soil penetration depth. Foot prints generated upon plastic material in the laboratory may also be analyzed. Walking velocity may also be determined and dynamograms derived from walking on a force measurement pad produce patterns which can identify individuals.

Falls from Heights. Accidentally falling directly down from a high elevation in contrast with an impulse after being purposely thrown outward is discussed. The normal descending path of a manikin was provided. The descending pathways of swimmers jumping from a platform were described. Also described were the horizontal patterns of standing jumps and running jumps.

As previously indicated, the questions of footprint analysis, ballistic penetration, traumatic head blows and trajectories of falling torsos may at some time arise in a civil or criminal case. Considering its contents and price, the book is a worthwhile purchase for the forensic expert's library.

Bioballistics. The perforating, shattering and tearing effect of a missile (usually a bullet) entering tissue may be observed to hydrodynamically damage tissues and fracture bone at areas remote to the path of the projectile.

Head Injury from Blows. Crater analysis is provided from corpses struck upon the head by spheres of various diameters at various forces upon various bone thickness. Data is also provided related to blows by the fist.

Charles A. Cacha is the CEO of Ergonix Inc., a firm dedicated to forensics work in Human Factors, Ergonomics and Public, Product and Worker Safety.

Availability. The authors wrote this book under a grant. They have approximately 100 free copies available upon request. There would be, however, a postage charge of approximately \$10.00 which would be billed by the authors after the book has been mailed. The authors' address is:

90406-1369. Phone: (310) 394-1811.

FORENSICS PROFESSIONAL GROUP

The **FORVM** is a publication of the Forensics Professional Group (FPG) of the **Human Factors and Ergonomics Society**. Membership in the FPG is open to all people interested in the application of human factors and ergonomics to a professional forensics practice.

Membership in the Human Factors and Ergonomics Society is not required for membership in the FPG. For further information, contact the Central Office of the HFES: P.O. Box 1369, Santa Monica, CA

The *FORVM*

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Application for Membership

Forensics Professional Group, Human Factors and Ergonomics Society

Membership in the FPG does not require membership in the Human Factors and Ergonomics Society. Members of the HFES may pay FPG dues with their HFES dues. Please print.

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Are you a full-time student? () yes () no Are you a member of the HFES? () yes () no

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