Abstract ID: 1614J
Title: Rapid Development of Precise Metrics for Human Performance Assessment
Subcommittee: Human Performance Analysis and Engineering
Abstract Text: Objectives: The system dynamics of social encounters between warfighters/police officers and community members often make these encounters rapidly in ways that are complex and difficult to predict—or measure. High-level performance in these encounters requires naturalistic decision making, and tools such as cognitive task analysis tend to be expensive and time consuming. As a consequence, metrics used to develop policies, procedures, and training on performance in these high-risk/high-consequence encounters are often concept based and measured subjectively using ordinal measures. We address this gap by developing and testing a novel technique for rapidly prototyping interval-level metrics for measuring human performance at a granular level. Because, environmental variables strongly affect the likelihood of a desirable outcome in these encounters, we also used these novel techniques to develop situation-based difficulty metrics. They allow repeated exposure to scenario-based training that holds difficulty constant or varies it in a predictable direction. Methods: A novel pairing of two well-established research techniques, concept mapping and Thurstone scaling was used to develop measurement scales that substantially improve our ability to measure individual performance in dynamic encounters: a) a potentially deadly encounter, b) a routine police-citizen encounter, and c) an encounter with a person in crisis. Results: Metrics were successfully developed, tested and employed to score data from human subject experiments using both computerized deadly force judgment and decision making simulator scenarios and role-play training. They also have been successfully used to develop high-definition training scenarios and establish performance criteria, behavioral objectives, and training curricula that have been implemented and tested. Conclusions: The methodology described here offers a rapid, cost-effective, scientifically valid process for uncovering critical elements within the system dynamics of social encounters. This process allows for the predictable manipulation of training difficulty and weighted, interval-level performance objectives.

Will this paper have one or more authors from outside the U.S.? No

Discussion Points:
1. Simulation
2. Modeling
3. Training
4. Naturalistic
5. Performance

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Biography: Stephen James, Ph.D., is a Post-Doctoral Research Fellow at Washington State University - Spokane. His research focus includes the interaction between law, policy, training and practice relating to operational performance for military and law enforcement personnel. Dr. James strives to better understand the dynamics of performance in a wide variety of military and policing tasks; driving, citizen encounters, crisis intervention, and deadly force encounters. Dr. James utilizes neurophysiological measurements and simulation technology to evaluate training and performance of military and law enforcement personnel. This research will lead to more effective, and more cost effective, training and greater public safety. Prior to becoming an academic Dr. James spent more than 20 years in the British infantry as a soldier and officer; serving in Cyprus, the former Yugoslavia, Northern Ireland, and Afghanistan.

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Status: APPROVED
Abstract ID REF: 15143

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Primary Author: James / Via

Committee: Human Performance Analysis and Engineering

Human Performance Analysis and Engineering: Work that addresses the role of the human as an integral component within systems and in mission accomplishment.

The committee seeks papers that address the role of the human as an integral component within systems and in mission accomplishment. Papers should address topics such as: usability/user experience, community of practice, organizational effectiveness, Interactive electronic technical manuals (IETM), electronic performance support systems (EPSS), job aids, performance-centered design, human-computer interface (HCI), maintenance mentoring, decision support systems, knowledge management tools, immersive stimulation techniques, situational awareness, human performance assessment, and the application of Human Systems Interface (HSI) technologies. Submissions should address the application of theories; methods; tools; performance measurement; and principles of Human Performance Design, HSI, and Human Factors. Specifically, the committee seeks papers (supported by the collection of data provided by the human within the learning environment) that address human performance enabled through on-demand availability of structured knowledge, task and decision aids, human-centered design, and failed systems that leverage and extend the capabilities of the warfighting team. Papers supported by human performance data gathered from innovative, scientifically valid experiments are especially valued.

Evaluation

Substance: The controlling idea and the support for it. The total concept the author wants to present. A good idea can survive mechanical flaws, but perfect spelling and grammar can't save poor ideas.

Originality: A new concept that furthers the evolution of the committee's subject area. A repeat of past theories that add nothing to the community of knowledge are generally unacceptable, unless the prospective abstract/paper promises to impart knowledge that may be of substantive value to a novice audience.

Acceptance

Accept [ ] Project [ ] Discuss [ ] Sales Pitch [ ] Similar Abstract [ ]

International Abstract [ ] (Specify ID Ref No.) [ ] Transfer to [ ]

Key Words or Concepts

Other Comments/Remarks