

Proceedings of the 1st Annual World Conference  
of the Society for Industrial and Systems Engineering,  
Washington, D.C, USA  
September 16-18, 2012

## Psychophysics in Occupational Ergonomics

**Robert J. Marley<sup>1</sup> and Jeffrey E. Fernandez<sup>2</sup>**

<sup>1</sup>Montana State University, Bozeman, MT 59717, USA

<sup>2</sup>JFAssociates, Inc., Vienna, VA 22181, USA

Corresponding author's Email: [rmarley@coe.montana.edu](mailto:rmarley@coe.montana.edu)

**Author Notes:** Robert Marley is Dean of the College of Engineering at Montana State as well as Professor of Mechanical & Industrial Engineering. His teaching and research interests have focused upon occupational ergonomics, safety engineering and experimental methods. Jeffrey Fernandez is the Managing Principal of JFAssociates in Vienna, VA, and formerly a professor at Wichita State University. His research and consulting experience have focused on occupational ergonomics as well as industrial engineering and the design of industrial work systems.

**Abstract:** This paper examines an approach to modeling the relationship between perceived acceptable work exposures and physical stressors in upper-extremity tasks using psychophysical method. This approach provided unique and feasible solutions to work design problems involving exposure to the hazard of manual materials handling. In addition, psychophysical methods have been applied to upper-extremity activities to estimate acceptable work limits. A review of psychophysical theory and methods which can be applied to a wide range of occupational activities is provided.

**Keywords:** Psychophysics, Occupational Ergonomics, Manual Materials Handling, Upper-Extremity Work Limits.