

Rahmat Muhammad, Ph.D.
Senior Scientist

Professional Profile

Dr. Rahmat Muhammad is a Senior Scientist in Exponent's Human Factors practice. Dr. Muhammad has experience in devising and implementing strategies to address how human cognition and behavior impact the use (or misuse) of products, such as medical devices, medications, cosmetics, foods and consumer products. Her analyses uncover specific factors that contribute to users' decisions to purchase a product, users' preferred sources of information about a product, and users' behavioral responses to risk communications when using a product. In addition to consumer populations, her work examines decisions of health care professionals in using medical devices and prescribing medications. She has investigated and identified how cognition and behavior influence the effectiveness of risk communications, and has published on the topic of risk communication through warnings.

Dr. Muhammad also investigates accidents related to everyday human activities such as walking and driving. She has identified perceptual and cognitive factors that can affect pedestrian and driver behaviors and has published on the topic of maintaining one's balance while standing or walking.

Dr. Muhammad routinely analyzes the frequency and patterns of incidents associated with a variety of products and activities using large-scale databases available through the Food and Drug Administration (FDA) and the Consumer Product Safety Commission (CPSC).

Prior to joining Exponent, Dr. Muhammad completed a Ph.D. in Neuroscience at the Massachusetts Institute of Technology. Her education and research were concerned with understanding the brain functions which underlie behaviors such as information processing, attention, learning and memory, object perception, planning, decision making, and movement execution.

Academic Credentials and Professional Honors

Ph.D., Neuroscience, Massachusetts Institute of Technology, 2009

B.A., Biology and Philosophy, Boston University (*summa cum laude* with distinction), 2003

National Science Foundation Graduate Research Fellowship, 2005–2008; Leventhal Graduate Fellowship, 2005–2007; Praecis Presidential Fellowship, 2003–2005; Ada Draper Travel Scholarship (Summer, 2003; Boston University's Trustee Scholarship, 2001–2003; Excellence in Biology, 2003; Robert S. Cohen Award in Interdisciplinary Studies, 2003; Phi Beta Kappa, 2003

Publications

Muhammad R, Rodowicz K, Heller M, Sala J, Mkandawire C. Biomechanical, perceptual, and cognitive factors involved in balance recovery following unexpected perturbations: A literature review. ASME International Mechanical Engineering Congress and Exposition, IMECE2010-39285, November 12-18, 2010.

Rodowicz K, Muhammad R, Heller M, Sala J, Mkandawire C. Biomechanical, perceptual, and cognitive factors involved in maintaining postural control while standing or walking on non-moving and moving surfaces: A literature review. ASME International Mechanical Engineering Congress and Exposition, IMECE2010-39276, November 12-18, 2010.

Sala JB, Nichols EA, Muhammad R, Lakhiani SD, Rauschenberger R, Wood CT. Government, warnings, safety information: A comparison of inter-agency regulations and guidance. In: *Advances in Human Factors, Ergonomics, and Safety in Manufacturing and Service Industries*. Karwowski W, Salvendy G (eds), pp. 1047–1056, CRC Press, 2010.

Blais B, Frenkel M, Kuindersma S, Muhammad R, Shouval HZ, Cooper LN, Bear MF 2008. Recovery from monocular deprivation using binocular deprivation: Experimental observations and theoretical analysis. *J Neurophysiology* 2008; 100(4):2217–2224.

Muhammad R, Wallis JD, Miller E. A comparison of abstract rules in the prefrontal cortex, premotor cortex, inferior temporal cortex, and striatum. *J Cognitive Neurosci* 2006; 18:974–989.