Exponent®
Engineering & Scientific Consulting

Rachel Kelly, Ph.D.
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Professional Profile

Dr. Rachel Kelly specializes in work related to cognition, perception, and behavior as it relates to human factors. She applies her expertise to the development and evaluation of warning and safety information, behavioral response to risk communication and/or product design, driver behavior, training, attention and distraction, visibility, decision-making, and human motor control.

Leveraging her background in physiology and cognitive neuroscience, Dr. Kelly applies her expertise to understand human factors issues in diverse contexts. These include the analysis of a variety of accidents and injuries involving motor vehicles and pedestrians, industrial machinery and equipment, occupational accidents, consumer and medical device products, and slip-and-fall accidents. Dr. Kelly also regularly evaluates the adequacy of industrial and consumer product labels, warnings, instructions, safety information, and other forms of communication and has experience evaluating compliance with industry standards.

Dr. Kelly also capitalizes on her more than 12 years of experience as a researcher, specializing in the design, execution, and analysis of human subject studies, focus groups, and surveys. She has conducted domestic and international usability studies and surveys for consumer products and technology, analyzing how users interact with and use products in a range of environments and scenarios. The purpose of these studies is to understand these interactions in terms of human capabilities and limitations, as well as their implication on product design and risk communication.

Prior to joining Exponent, Dr. Kelly was a Graduate Research Assistant in the Cognitive Motor Control Laboratory at Georgia Institute of Technology where she completed a National Institutes of Health Fellowship for Prosthetics and Orthotics Research Training. Her research evaluated the neurophysiology behind the motor planning process of movement in humans. Specifically, her focus was on deepening our understanding of the interaction between cognitive and motor systems for the performance of skillful motor tasks, and how factors such as handedness influence these interactions. Dr. Kelly also was appointed as a Graduate Teaching Assistant at Georgia Tech for courses in Human Performance Science and as a program instructor for the Duke Talent Identification Program (Duke TIP). After graduate school, Dr. Kelly was a member of the Georgia State University faculty where she taught undergraduate and graduate-level courses in cognitive neuroscience, neuroendocrine and endocrine systems, anatomy and physiology, drugs and behavior, and medical ethics.

Academic Credentials & Professional Honors

Ph.D., Applied Physiology, Georgia Institute of Technology, 2015

B.S., Psychology, Georgia Institute of Technology, 2009

NIH Fellow for Prosthetics and Orthotics Research Training, 2012-2015

Georgia Institute of Technology Presidential Scholarship, 2010-2014

Georgia Tech (GTRIC) Travel Award, 2011

Academic Appointments

Visiting Professor, Georgia State University, 2015

Program Instructor, Anatomy, Physiology, and Medical Ethics, Duke TIP, 2015

Professional Affiliations

Digital Medicine Society (DiME)

Consumer Technology Association (CTA)

Human Factors and Ergonomics Society (HFES)

American Psychological Association (APA)

Publications

Keale JH, Freeman TR, Sala JB, Kelly RL. Simple vs. Detailed: Inherent Tension in Warning Design. Industry Today 2021.

Mizelle JC, Kelly RL, Wheaton LA. Ventral encoding of functional affordances: A neural pathway for identifying errors in action. Brain Cogn 2013; 82:274-282.

Kelly RL, Wheaton LA. Differential mechanisms of action understanding in left and right-handed subjects: the role of perspective and handedness. Front Psychol 2013; 4:957.

Kelly RL, Mizelle JC, Wheaton LA. Distinctive laterality of neural networks supporting action understanding in left- and right-handed individuals: an EEG coherence study. Neuropsychologia 2015; 75:20-29.

Presentations and Published Abstracts

Kelly R. Understanding the neurophysiology of action interpretation in right and left-handed individuals. Presented at the School of Applied Physiology on March 13, 2015. Dissertation defense.

Kelly R. Cortico-muscular network dependent on hand seen during action recognition. Presented at the School of Applied Physiology Brown Bag meeting on November 05, 2014.

Kelly R. Understanding the action encoding system: Towards a neurophysiological model of the motor simulation process. Presented at the School of Applied Physiology on March 05, 2014. Proposal presentation.

Kelly R. Handedness and perspective on action recognition: towards a neurophysiological model. Presented at the School of Applied Physiology Brown Bag meeting on December 2013.

Kelly R. Perspective and handedness on action recognition: towards a neurophysiological model of action

simulation. Presented at the School of Applied Physiology Brown Bag meeting on February 27, 2013.

Kelly R. The progression of learning tool function through action recognition. Presented at the School of Applied Physiology Brown Bag meeting in March 2012.

Kelly ., Wheaton LA. Cortico-muscular network dependent on handedness and perspective during action recognition: Towards a neurophysiological model of action simulation. The Society for Neuroscience Annual Meeting in Washington, DC, November 15-19, 2014.

Kelly R, Mizelle JC, Wheaton LA. Effects of handedness and perspective during action recognition: towards a neurophysiological model of action simulation. GTRIC poster competition in Atlanta, GA, March 18, 2014.

Kelly R, Wheaton LA. Handedness and perspective during action recognition: towards a neurophysiological model of action simulation. The Society for Neuroscience Annual Meeting in San Diego, CA, October 12-17, 2013.

Mizelle JC, Kelly, R., Wheaton LA. A role for ventral stream brain areas in understanding errors in tool manipulation. The Society for Neuroscience Annual Meeting in San Diego, CA, October 12-17, 2013.

Kelly R, Wheaton LA. Looking at understanding the influence of perspective on handedness in action recognition in right handed subjects. The Cognitive Neuroscience Society meeting poster competition in San Francisco, CA, April, 2013.

Kelly R, Wheaton LA. Understanding the influence of perspective on handedness in action recognition. GTRIC poster competition in Atlanta, GA, February 12, 2013.

Kelly R, Wheaton LA. The Influence of perspective on handedness in action recognition. The Society for Neuroscience Annual Meeting in New Orleans, LA, October 12-17, 2012

Kelly R, Wheaton LA. The role of perspective and handedness in action recognition. GTRIC poster competition, Atlanta, GA, February 7, 2012.

Kelly R, Mizelle JC, Wheaton LA. Neuroimaging analysis of the functional understanding of tools. The Society for Neuroscience Annual Meeting in Washington D.C., November16-20, 2011.