

Exponent®
Engineering & Scientific Consulting

Joseph Sala, Ph.D.

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Professional Profile

Dr. Sala's work focuses on the cognitive, perceptual, physical, and developmental human factors issues relating to accidents and injuries. He applies this expertise to the analysis of visibility, the effect of attention on human performance, lifespan and age differences in behavior, human information processing and decision-making, and the development and evaluation of warning and safety information.

Dr. Sala has analyzed human factors issues in accidents associated with a number of scenarios (e.g., motor vehicles, consumer products usage, slips/trips and falls, recreational activities) resulting in a variety of injuries (e.g., burns and scalds, submersions, mechanical suffocation, electrocutions, poisonings).

Using large-scale incident and injury data (e.g., the Consumer Product Safety Commission's National Electronic Injury Surveillance System, Centers for Disease Control's Wide-ranging Online Data for Epidemiologic Research, etc.), Dr. Sala has performed injury and risk analysis to measure the safety of products, and he has examined the effectiveness of some of the strategies used to reduce risk. In addition, he has used his experience to conduct product usability studies and to examine the physical and cognitive abilities of both child and adult users as they interact with particular products and environments.

Prior to joining Exponent, Dr. Sala completed a Ph.D. in psychology at the Johns Hopkins University and was a post-doctoral fellow at Stanford University. During that time he focused his research on the cognitive neuroscience of human information processing, the brain mechanisms underlying learning, memory, vision, and cognitive control, and their behavioral manifestations. In his research, he used a variety of experimental methods (behavioral, neuroimaging, and patient case studies) and statistical analyses to explore the interactions between learning, vision, working memory, and attention.

Academic Credentials & Professional Honors

Ph.D., Psychology, Johns Hopkins University, 2004

M.A., Psychological and Brain Sciences, Johns Hopkins University, 2001

B.A., Psychology, Rutgers University, 1998

B.S., Administration of Justice, Rutgers University, 1998

National Research Service Award training grant through the Department of Neurobiology, Stanford University, 2004-2005

J. Brien Key Graduate Award, 2002, 2000

National Science Foundation Graduate Research Fellowship Honorable Mention, 2000

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Edward J. Bloustein Distinguished Scholar, 1994-1998

Academic Appointments

Lecturer, Drexel University, 2007-2012

Professional Affiliations

Society for Neuroscience

Society for Risk Analysis

Human Factors and Ergonomics Society

- Forensic Professional Group Chair

Association for Psychological Science

Publications

Rauschenberger R, Sala JB, Wood CT. Product warnings and the involuntary capture of attention. Proceedings, Human Factors and Ergonomics Society 59th Annual Meeting, Los Angeles, CA, 2015.

Perlmutter, S, Cades DM, Heller, MF, Giachetti, RS, Sala JB, Arndt, SA. Effects of mobile technology use on walking. Proceedings, 58th Human Factors and Ergonomics Society Annual Meeting, 2014.

Quartuccio, J, Franz S, Gonzalez, C, Kenner, NM, Cades DM, Sala JB, Arndt, SA, McKnight, PE. Seeing is believing: The use of data visualization to identify trends for cycling safety. Proceedings, 58th Human Factors and Ergonomics Society Annual Meeting, 2014.

Rauschenberger R, Wood CT, Sala JB. Human factors and the design of medical devices. In: Bringing your medical device to market. Reiss JB (ed), pp. 215-226, Food and Drug Law Institute, 2013.

Cades DM, Arndt SR, Sala JB, Krauss DA. What you need to know about the distracted driver. Feature Article in The Illinois Association of Defense Trial Counsel Quarterly 2013; 23(4).

Todd J, Sala J, Heckman G, Krauss D. Validation of high dynamic range photography as a tool to accurately represent low-illumination scenes. SAE Technical Paper 2012-01-0078, Society for Automotive Engineers, Inc., 2012.

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.

Khan FS, Sala JB, Arndt SR. Considerations in the textless presentation of warning and safety information. Proceedings, 15th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Mexico City, Mexico, 2010.

Khan FS, Sala, JB, Arndt SR. Reducing subjectivity when attempting auditory scene recreation in accident reconstruction. Proceedings, Human Factors and Ergonomics Society 54th Annual Meeting, San Francisco, CA, 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.

Sala JB, Courtney SM. Flexible working memory representation of the relationship between an object and its location as revealed by interactions with attention. Attention Perception Psychophysics 2009; 71(7):1525-1533.

Khan FS, Sala JB, Arndt SR. Psychoacoustic response to auditory warnings. Proceedings, 14th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Anaheim, CA, 2009.

McGowan JC, Shkolnikov Y, Sala JB, Ray R. Diffuse electrical injury: A questionable phenomenon. Biomedical Engineering, Recent Developments (ISBN 978-1-930636-07-1) 2008; 65-67.

McGowan JC, Shkolnikov Y, Sala JB Ray R. Diffuse electrical injury: Questioning the scientific basis. IEEE Proceedings of the Canadian Conference on Electrical and Computer Engineering, Niagara Falls, pp. 1977-1980, 2008.

Sala JB, Courtney SM. Binding of what and where during working memory maintenance. Cortex 2007; 43:5-21.

Huntley-Fenner G, Wood CT, Sala JB. Study of the impact of California's Proposition 65 warnings on safety related awareness and behaviors. Proceedings, Society for Risk Analysis, San Antonio TX, December 9-12, 2007.

Courtney SM, Roth JK, Sala JB. A hierarchical biased-competition model of domain-dependent working memory maintenance and executive control. In: The Cognitive Neuroscience of Working Memory. Oxford University Press, 2007.

Wood CT, Sala JB, Sanders K, Cassidy P. Trends in consumer product warnings. Proceedings, 50th Annual Meeting of the Human Factors and Ergonomics Society, Santa Monica, CA, 2006.

Sanders K, Wood CT, Sala JB. Human factors engineering for medical devices. In: Bringing Your Medical Device to Market. Food Drug Law Institute, Washington, D.C., 2006.

Sayala S, Sala JB, Courntey SM. Increased neural efficiency with repeated performance of a working memory task is information-type dependent. Cerebral Cortex 2006; 16: 609-617.

Preston A, Gaare M, Sala JB, Wagner AD. Stimulus-specific novelty encoding and subsequent memory responses in human medial temporal lobe. Cognitive Neuroscience Society Annual Meeting Abstracts, New York, NY, April 9-12, 2005.

Rämä P, Poremba A, Sala JB, Yee L, Malloy M, Mishkin M, Courtney SM. Dissociable functional cortical topographies for working memory maintenance of voice identity and location. Cerebral Cortex 2004, 14:768-780.

Sayala S, Sala JB, Courtney SM. Spatially selective changes in fMRI activation during repeated performance of working memory tasks. Society For Neuroscience Annual Meeting Abstracts, San Diego CA, October 23-27, 2004.

Sala JB, Badre D, Wagner AD. Investigating effective connectivity of prefrontal cortex and cognitive control using dynamic causal modeling. Poster presented at Bay Area Memory Meeting, 2004.

Sala JB, Courtney SM. Active maintenance and the binding of information during working memory. Cognitive Neuroscience Society Annual Meeting Abstracts, San Francisco CA, April 18-20, 2004.

Sala JB, Rama P, Courtney SM. Functional topography of a distributed neural system for spatial and nonspatial information maintenance in working memory. Neuropsychologia 2003, 41(3):341-356.

Sala JB, Sayala S, Courtney SM. Altered working memory activation pattern in a multiple sclerosis patient with superior frontal white matter lesions. Society for Neuroscience Annual Meeting Abstracts, New Orleans LA, November 8-12, 2003.

Sayala S, Sala JB, Courtney SM. Changes in parietal cortex during repeated performance of working memory tasks. Society for Neuroscience Annual Meeting Abstracts, New Orleans LA, November 8-12, 2003.

Yee L, Sala JB, Courtney SM. Working memory for color versus shape. Society for Neuroscience Annual Meeting Abstracts, New Orleans LA, November 8-12, 2003.

Sala JB, Courtney SM. Contribution of non-preferred information to activation during working memory for objects-in-locations. Society for Neuroscience Annual Meeting Abstracts, Orlando FL, November 2-7, 2002.

Sala JB, Courtney SM. Working memory for the conjunction of pattern identity and location. Human Brain Mapping Annual Meeting Abstracts, Sendai Japan, June 10-16, 2002.

Rämä P, Sala JB, Gillen JS, Pekar JJ, Courtney SM. Dissociation of the neural systems for working memory maintenance of verbal and nonspatial visual information. Cognitive, Affective, & Behavioral Neuroscience 2001; 1(2):161-171.

Sala JB, Rämä P, Courtney SM. Patterns of activation during encoding, maintenance and recognition phases of a working memory task. Society for Neuroscience Annual Meeting Abstracts, San Diego CA, November 10-15, 2001.

Sala JB, Rämä P, Courtney SM. Modulation of perceptual processing during encoding versus recognition in working memory. Talk presented at Attention and Capture Conference - Eastern Psychological Association, Baltimore MD, 2001.

Sala JB, Rämä P, Courtney SM. Involvement of spatially specialized areas in object working memory. Cognitive Neuroscience Society Annual Meeting Abstracts, New York NY, 2001.

Sala JB, Rämä P, Gillen JS, Courtney SM. Working memory for identity and location of faces or houses: an fMRI investigation. Society for Neuroscience Annual Meeting Abstracts, New Orleans LA, November 4-9, 2000.

Rämä P, Sala JB, Gillen JS, Courtney SM. Working memory for famous and unfamous faces and names. Society for Neuroscience Annual Meeting Abstracts, New Orleans LA, November 4-9, 2000.

Project Experience

Evaluated the visibility of pedestrians and other roadway objects, assessing the effects of a variety of factors such as lighting and potential obstructions.

Assessed the adequacy of a variety of product related safety information in a number of “failure to warn” claims. Considered alternative or additional information and its potential to produce behavioral change and or result in accident avoidance.

Designed testing protocols to address the cognitive, behavioral, and physical abilities of children. Evaluated the design of a wide variety of products and attempts to limit child access and activation.

Performed quantitative and comparative injury risk analysis across a wide variety of consumer, recreational, and occupational products.

Assisted manufacturers to respond to governmental agency (e.g., CPSC, FDA, EPA) inquiries regarding product safety, recall, and regulatory matters.

Developed, revised, and commented on warnings, labeling, and instructions for an array of consumer, recreational, and occupational products.

Assessed the conspicuity of a variety of environmental stimuli, relating physical attributes to the capabilities and limitations of human sensory systems and associating these factors to accident causation and avoidance.

Studied public awareness and understanding of posted warnings and the effect this signage may have on human behavior.

Assisted manufacturers in the development of internal design standards addressing potential hazards and increasing consistency across products.