

Exponent®
Engineering & Scientific Consulting

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Professional Profile

Iiona D. Scully, Ph.D., is a senior managing scientist in Exponent's Human Factors practice specializing in the investigation of human factors in transportation accidents; consumer product safety information and warnings; slips, trips, and falls; and advanced driver assistance systems (ADAS) and automated vehicles (AVs). She consults in these areas of expertise for law firms, insurers, consumer product industries, and the federal government, and she has used her expertise to testify as a technical expert in litigation matters.

Transportation Accident and Driver and Pedestrian Behavior Investigations

Dr. Scully investigates the human factors underlying transportation accidents involving light-duty vehicles, commercial trucks, motorcycles, bicycles, and pedestrians. Her analyses address issues of environmental conditions, pedestrian behavior, and driver and operator behavior including perception response time (PRT), situational awareness, visual and auditory perception, lighting and conspicuity, stress and fatigue, attention and distraction, human memory and decision-making, and information processing.

Advanced Driver Assistance Systems and Automated Vehicles

Dr. Scully evaluates the human factors of ADAS and AVs, helping clients understand driver use, misuse, trust, and understanding of technologies such as forward collision warning (FCW), automatic emergency braking (AEB), adaptive cruise control (ACC), lane departure warning (LDW), lane keeping assist (LKA), lane centering assist (LCA), blind spot warnings (BSW), SAE Level 2 ADAS, and high-level vehicle automation. Her work addresses driver trust, mental models, mode awareness, experience, and response times.

Consumer Product Safety Information and Warnings

Dr. Scully performs evaluations of consumer product safety information, including warnings, labels, and instructions, across a wide range of product categories including, but not limited to, kitchen and household appliances, outdoor appliances, sporting goods, textiles, hair and cosmetic products, and vehicles. Dr. Scully has performed analyses of injury data, e.g., the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS), and has experience in the design, implementation, execution, and analysis of human subjects research evaluating how users understand and use consumer products.

Slip, Trip, and Fall Human Factors Assessments

Dr. Scully conducts human factors assessments of slip, trip, and fall incidents in commercial, residential, hospitality, retail, and public environments. Her evaluations address pedestrian attention and distraction, environmental lighting and conspicuity, walkway surface conditions, footwear, and the role of human perception and expectation in slips, trips, and falls.

Evaluation of Eyewitness Memory and Reliability

Dr. Scully evaluates the reliability of eyewitness perception, memory, and recall in civil litigation, transportation contexts, industrial contexts, product use, and criminal proceedings. Her analyses address how visual and auditory perception, attention, stress, time delay, post-event information, repeated questioning, and interactions among witnesses can impact what an individual perceives, retains, and later recalls.

Expert Witness Support and Testimony Experience

Dr. Scully has been qualified as a human factors expert and offered deposition and trial testimony in state and federal court. She has testified on several topics including vehicle operator behavior, pedestrian behavior, bicyclist behavior, perception response time, visual and auditory perception, nighttime visibility and conspicuity, eyewitness memory and perception, effects of warnings and safety information, driver use and understanding of ADAS, and consumer purchase decisions.

Dr. Scully has expertise in several statistical and research methodologies including quantitative data analysis, meta-analysis, and electrodermal activity (EDA) data collection and analysis.

Academic Credentials & Professional Honors

Ph.D., Psychology, Lehigh University, 2019

M.A., Psychology, Towson University, 2014

B.S., Psychology, Elmira College, 2011

Graduate Student Life Leadership Award, Lehigh University, 2019

College of Arts and Sciences Graduate Student Research Grant, Lehigh University, 2018

College of Arts and Sciences Leadership and Service Award, Lehigh University, 2018

Distinguished Graduate Student Award, Towson University, 2014

Cowles Honor Scholar, Elmira College, 2007-2011

Presidential Honor Scholarship, Elmira College, 2007-2011

Licenses and Certifications

Certified English XL Tribometrist (CXLT)

OSHA 10 Hour Outreach Training Program - General Industry

Prior Experience

Adjunct Professor, Statistical Analysis of Behavior, Lehigh University, 2017

Research Assistant, Lehigh University Language and Thought Lab, 2016-2017

Adjunct Professor, Cognitive Psychology, Lehigh University, 2015

Statistical Consultant, Dr. Susan Sperry, 2013

Professional Affiliations

Human Factors and Ergonomics Society, 2019-Present

• Surface Transportation Technical Group

SAE International 2022-Present

• Voting member of Lane Departure Warning and Lane Keeping Assist Task Forces 2022-2024

Association for Women in Science, 2017-Present

Association for Psychological Science, 2010-Present

Psychonomics Society, 2014-2019

National Association for Graduate and Professional Students, 2018-2019

Cognitive Science Society, 2016-2017

Publications

Grant LH, Chung YW, Diebol JK, Shlanta P, Scully ID. Warnings and multilingual audiences. Human Factors in Design, Engineering, and Computing, 2025; 199:1-10.

Davis SJ, Scully ID, Hoyos C, Denga R, Cades D. Human factors of automated vehicles. In: Forensic Aspects of Driver Perception and Response. 5th Edition. Krauss D (ed), Tucson, AZ: Lawyers and Judges Publishing Company, Inc., 2025.

Aldugom M., Izen SC, Scully ID, Hoyos C, Cades DM. How does adaptive cruise control use impact driver behaviors, mental models, and trust and perception in the system? Advances in Human Factors of Transportation, 2025; 186:351-360.

Scully ID, Shlanta P. Human factors: Driver response. In: Truck Accident Litigation. Fourth Edition. Baker AN, Young III DJ (ed), ABA Book Publishing, 2025.

Scully ID, Davis, SJ, Shlanta, P., Yanes, J.A., Michaelis, K., Cades, D.M. Looking back on forward collision warnings: A review of perception response time from empirical studies. Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 2024; 68(1):1627-1633.

Lennox KP, Scully ID, Yanes JA, Cades DM. Assessing the impact of driver assistance technology: A review of non-crash and crash studies. Advances in Human Factors of Transportation, 2024; 148:323-330.

Coelho CJ, Garets SB, Bailey JD, Frank TA, Scully ID, Cades DM. Human factors issues of advanced

rider assistance systems. Human Factors in Transportation, 2023; 95:292-303

Palac D, Scully ID, Jonas RK, Campbell JL, Young D, Cades DM. Advanced driver assistance systems (ADAS): Who's driving what and what's driving use? Proceedings of the Human Factors and Ergonomics Society Annual Meeting. 2021; 65(1):1220-1224.

Scully ID, Hupbach A.Directed forgetting affects how we remember and judge other people. Journal of Applied Research in Memory and Cognition, 2020; 9(3):336-344.

Scully ID, Hupbach A. Different reactivation procedures enable or prevent episodic memory updating. Hippocampus 2019; 30(80):806-814.

Scully ID, Napper LE, Hupbach A. Does reactivation trigger episodic memory change? A meta-analysis. Neurobiology of Learning and Memory 2017; 142(A):99-107.

Sperry SD, Scully ID, Gramzow RH, Jorgensen RS. Sleep duration and waist circumference in adults: a meta-analysis. Sleep 2015; 38 (8):1269-1276.

Scully I.D, Terry CP. Self-referential memory for the Big-Five personality traits. Psi Chi Journal of Undergraduate Research 2011; 16(3):123-128.

Presentations

Scully, ID, Como, S. Safety and Automation: Hazard Response at Different Levels of Automation. Presented at the 2025 meeting of the AAA Safe Mobility Conference, Madison, WI. 2025.

Lennox KP, Scully ID, Yanes JA, Cades DM. Assessing the impact of driver assistance technology: A review of non-crash and crash studies. Paper presented at the 2024 International Conference on Applied Human Factors and Ergonomics, Nice, France, 2024.

Scully ID, Napper LE, Hupbach A. Does Reactivation Trigger Episodic Memory Change? A Meta-Analysis. Poster presented at the International Conference on Psychological Science, Paris, France, 2019.

Malt BC, Scully ID, Lebkuecher A, Joseph J. Dynamic updating of native language constructions. Paper presented at the 2018 meeting of the Psychonomics Society, New Orleans, LA, 2018.

Hupbach A, Scully ID. Modifying human episodic memories: reactivation as a precondition for change. Paper Presented at the 2018 International Conference of Behavioral Neuroscience, Boca Raton, FL., 2018.

Hupbach A, Scully ID. Is Reactivation a Precondition for Episodic Memory Change? Paper presented at the 2018 meeting of the International Conference on Learning and Memory, Huntington Beach, CA., 2018.

Scully ID, Hupbach A. How reactivation strength affects memory updating. Poster presented at the 2017 meeting of the Cognitive Science Society, London, UK, 2017.

Scully ID, Napper LE, Hupbach A. Does Reactivation Trigger Episodic Memory Change? A Meta-Analysis. Poster presented at the 2017 Interdisciplinary Neuroscience Symposium, Bethlehem, PA, 2017.

Scully ID, Hupbach A. Memory Reconsolidation: Strength of Reactivation Modulates the Impact of New Learning on Reactivated Memories. Paper presented at the 2016 meeting of International Conference on Memory, Budapest, Hungary, 2016.

Scully I.D., Hupbach A. Does Reactivation Trigger Episodic Memory Change? A Meta-Analysis. Poster

presented at the 2016 meeting of the Psychonomics Society, Boston, MA, 2017.

Scully ID, Hupbach A. Memory Reconsolidation: Strength of Reactivation Modulates the Impact of New Learning on Reactivated Memories. Paper presented at the 2016 meeting of the Eastern Psychological Association, New York, NY, 2016.

Scully ID, Hupbach A. Memory Reconsolidation: Strength of Reactivation Modulates the Impact of New Learning on Reactivated Memories. Poster presented at the 2015 meeting of the Psychonomics Society, Chicago, IL, 2015.

Scully ID, Goodwin KA, Pararas B. Preventing the disruption: Does previous collaborative recall cancel out reconsolidation disruption? Poster presented at the 2014 meeting of the Psychonomics Society, Long Beach, CA, 2014.

Scully ID, Terry CP. Self-Referential Memory for the Big-Five Personality Traits. Poster presented at the Elmira College 2010-2011 Student Research Poster Session, Elmira, NY, 2011.

Scully ID, Terry C. Self-Referential Memory for the Big-Five Personality Traits. Poster presented at the 2011 Eastern Psychological Association Annual Conference, Cambridge, MA, 2011.

Scully ID. Does semantic priming cause the isolation effect? Poster presented at the Elmira College 2010 Parents Weekend Student Research Poster Session, Elmira, NY, 2010.

Scully ID. Does semantic priming cause the isolation effect? Poster presented at the Elmira College 2009-2010 Student Research Poster Session, Elmira, NY, 2010.

Scully ID, Lovett BJ. ADHD and extra time on tests. Poster presented at 25th Annual University of Scranton Psychology Conference, Scranton, PA, 2010.

Scully ID, Kilgour M. Words remembered using visual, auditory, and rote memorization techniques. Poster presented at Elmira College Student Research Poster Session, Elmira, NY, 2009.

Other Articles

Coelho CJ, Bailey JD, Frank TA, Scully ID, Cades DM. Motorcycle Safety and Advanced Rider Assistance Systems (ARAS). Article in Themis Advocates Group Latest News, February 2023

Scully ID, Scally S, Clark R, Carey MR, Cades DM, Harrington R. Safety and Regulatory Considerations of Advanced Driver Assistance Systems (ADAS). Article in American Bar Association Tort Trial and Insurance Practice Section's Committee News; Fall 2020.

Project Experience

Human Factors in Transportation

- Authored expert reports and testified in several matters involving the investigation of driver and pedestrian behavior. Assessed perception response time, visibility, conspicuity, attention, distraction, fatigue, expectancy, situational awareness, and decision-making.
- Conducted inspections and analyses assessing nighttime visibility and lighting conditions, including calibrated nighttime photography.
- Investigated driver behavior and human factors issues involving commercial trucks and fleet vehicles including blind spot detection, mirror use, lane-change behavior, workload, perception response time, and ADAS technologies.

- Served as a lead human factors researcher on National Highway Traffic Safety Administration (NHTSA) research initiatives focused on driver behavior, ADAS, driver monitoring systems (DMS), driver interaction with external technology, and automotive human-machine interfaces (HMIs).

Human Factors of ADAS and AVs

- Authored expert reports and testified in several matters involving the investigation and analysis of the human factors surrounding ADAS technologies in passenger and commercial vehicles, including FCW and AEB.
- Evaluated consumer purchase decisions and consumer understanding of advertising materials as it relates to ADAS performance.
- Conducted and directed research on how drivers understand and use ADAS and AVs. Synthesized empirical research concerning perception response time, trust, mental models, behavioral adaptation, and system use and misuse.
- Evaluated human factors issues associated with highly automated vehicle operations. These projects include assessing how children and other vulnerable road users (VRUs) may interact with automated vehicles and the assessment of automated vehicle HMI requirements.

Evaluation of Consumer Product Warnings and Safety Information

- Evaluated warnings, labels, instructions, manuals, packaging, and other safety communications for consumer and industrial products including, but not limited to, electric and gas stovetops and ovens, washing machines and dryers, sports and recreation equipment, textiles, car seats, kitchen appliances, vehicles, industrial machinery, aerosol cans, and hair care and cosmetic products.
- Authored expert reports and conducted human factors analyses related to user compliance with warnings and safety information.
- Designed and applied research methods to evaluate how consumers interpret and respond to product information. Used literature reviews, injury-data analyses, human subjects methods, survey approaches, and quantitative analysis to provide evidence-based guidance concerning consumer understanding, risk assessment and communication, and warning effectiveness.

Evaluation of the Human Factors of Slips, Trips, and Falls

- Authored expert reports and conducted human factors analyses in matters involving slip, trip, and fall incidents in commercial, residential, hospitality, retail, and public environments. Applied research concerning pedestrian perception, attention, gait, visual search, human movement, expectation, and hazard recognition.
- Assessed environmental conditions and conducted site inspections involving measurements of walkways, stairs, ramps, and changes in elevation, as well as evaluations of lighting, surface characteristics, and slip resistance.

Peer Reviews

Neurobiology of Learning and Memory

Journal of Applied Research in Memory and Cognition

Proceedings of the Human Factors and Ergonomics Society Annual Meeting

SAE International World Congress Experience (WCX)