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ERIN M HARLEY, PHD

Principal Human Factors Scientist

Dr. Erin Harley is a Principal Human Factors Scientist at Guidance Engineering and Applied Research. Dr. Harley's work focuses on the perceptual, cognitive, and performance human factors issues relating to safety, accidents, and injuries. She applies her specialized knowledge of human perceptual and cognitive processes to the analysis of visibility and lighting, reaction time, the effects of attention and distraction on performance, driver perception and response, gait and loss of balance, performance in sports and recreational activities, and warning design and compliance. She has analyzed human factors issues in product liability, transportation (e.g., automobile, bicycle, pedestrian, and maritime accidents), recreational sports, and premises liability cases including driver gearshift errors, auto/pedestrian accidents, ski accidents, slips/trips and falls, among others. In addition, Dr. Harley applies her expertise in perception, cognitive biases, and memory to issues surrounding the evaluation of eyewitness perception and memory.

Dr. Harley has published scientific research related to driver gear-shifting behaviors and errors, snow sport safety, warning compliance, visual perception and memory, hindsight bias (the "knew-it-all-along" effect), and analyses of store-related injuries. In addition, Dr. Harley has evaluated labeling, manuals, and safety guides for consumer products and activities. As a certified English XL Tribometrist, she also assesses the slip resistance of walkway surfaces.

Dr. Harley completed a Ph.D. in cognitive psychology at the University of Washington and worked as a post-doctoral research fellow at the University of California, Los Angeles. During that time, she used both behavioral and neuroimaging techniques to conduct research on how people process, interpret, and remember the visual environment, and how such interpretations affect performance on real-world tasks. In 2005, Dr. Harley's unique research on hindsight bias earned her an invitation to speak at the International Hindsight Workshop in Leipzig, Germany with other leading researchers in the field.

Academic Credentials and Professional Honors

Ph.D., Cognitive Psychology, University of Washington, 2003

B.A., Psychology, Boston University, 1997

University of Washington Social Sciences Dissertation Fellowship, 2002–2003; Outstanding Northwest Cognition and Memory (NOWCAM) Presentation, 2000; Fellowship for participation in the McDonnell Foundation's Summer Institute in Cognitive Neuroscience at Dartmouth College, 2000

Prior Experience and Academic Appointments

Principal Scientist, Human Factors Practice, Exponent, Inc., 2006–2021

Lecturer, University of California, Los Angeles, Department of Psychology, 2007

Post-Doctoral Fellow, University of California, Los Angeles, 2003–2006

Licenses and Certifications

Certified English XL Tribometrist (CXLT), for floor slip resistance measurements

Professional Affiliations

Human Factors and Ergonomics Society

International Society for Snowsport Safety

ASTM International

- Committee F27 on Snow and Water Sports
- Committee F13 on Pedestrian/Walkway Safety and Footwear

Publications

Harley EM, Stepan L, Scher IS. An observational study of skier compliance with posted “slow” signs and ski patrollers. *Journal of Science and Medicine in Sport* 2021; 24:1061-1066.

Giroux ME, Coburn PI, Harley EM, Connolly DA, Bernstein DM. Hindsight bias and law. *Zeitschrift für Psychologie* 2016; 224(3):190–203.

Kim R, Crump C, Harley E, Nauhaus G, Yigit-Elliott S. Store-related injuries to children and adults. *Proceedings of the Human Factors and Ergonomics Society 59th Annual Meeting 2015*; 1457–1461.

Shealy J, Scher I, Stepan L, Harley E. Jumper kinematics on terrain park jumps: Relationship between takeoff speed and distance traveled. *Journal of ASTM International* 2010; 7(10) (ID JAI102885).

Harley E, Scher I, Stepan L, Young D, Shealy J. Reaction times of skiers and snowboarders. *Journal of ASTM International* 2010; 7(9) (ID JAI102829).

Heckman GM, Harley EM, Scher IS, Young DE. Helmet use in sledding: Do users comply with manufacturer warnings? *Human Factors and Ergonomics Society Annual Meeting Proceedings, Forensics Professional* 2010; 733-737.

Harley EM, Pope WB, Villablanca JP, Mumford J, Suh R, Mazziotta JC, Enzmann D, Engel SA. Engagement of fusiform cortex and disengagement of lateral occipital cortex in the acquisition of radiological expertise. *Cerebral Cortex* 2009; 19:2746–2754.



Scher I, Harley E, Richards D, Thomas R. Likelihood of brain injury in motorcycle accidents: A comparison of novelty and DOT-approved helmets. SAE Paper 2009-01-0248, Society of Automotive Engineers, Inc., Warrendale, PA, 2009.

Heckman GM, Jackson GW, Keefer RE, Ray R, Harley EM, Young DE. Mechanisms of automatic transmission console shift selection and driver egress. Society of Automotive Engineers 2009 World Congress, April 2009. Paper judged to be among the most outstanding SAE Technical Papers of 2009 and thus further published in the SAE International Journal of Engines, Volume 2, September 15, 2009.

Harley EM, Trachtman D, Heckman GM, Young DE. Driver gear-shifting behaviors and errors. Human Factors and Ergonomics Society Annual Meeting Proceedings 2008; 52(23):1898–1902.

Harley EM. Hindsight bias in legal decision making. *Social Cognition* 2007; 25(1):38–57.

Bernstein DM, Harley EM. Fluency misattribution and visual hindsight bias. *Memory* 2007; 15(5):548–560.

Huntley-Fenner G, Harley E, Trachtman D, Young D. ANSI Z535.6 and conspicuity: A test of the new state of the art format for instructions. Human Factors and Ergonomics Society Annual Meeting Proceedings, Product Design 2007; 1029–1033.

Heckman GM, Bouvier SE, Carr VA, Harley EM, Cardinal KS, Engel SA. Nonlinearities in rapid event-related fMRI explained by stimulus scaling. *NeuroImage* 2007; 34:651–660.

Loftus GR, Harley EM. Why is it easier to identify someone close than far away? *Psychonomic Bulletin & Review* 2005; 12(1):43–65.

Harley EM, Carlsen KA, Loftus GR. The “saw-it-all-along” effect: Demonstrations of visual hindsight bias. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 2004; 30(5):960–968.

Harley EM, Dillon AM, Loftus GR. Why is it difficult to see in the fog? How contrast affects visual perception and visual memory. *Psychonomic Bulletin and Review* 2004; 11(2):197–231.

Loftus GR, Harley EM. How different spatial-frequency components contribute to visual information acquisition. *Journal of Experimental Psychology: Human Perception and Performance* 2004; 30(1):104–118.

Harley EM, Loftus GR. MATLAB and graphical user interfaces: Tools for experimental management. *Behavior Research Methods, Instruments, and Computers* 2000; 32(2):290–296.

Published Abstracts and Conference Presentations

Harley EM, Stepan LL, Scher IS. A controlled study of skier compliance with posted “SLOW” signs and ski patrollers. Paper presented at the 23rd International Congress on Snow Sports Trauma and Safety, Squaw Valley, California, USA, April 2019.



Stepan L, Scher I, Harley E, Shealy J. Chairlift restraining bar usage: A pilot study at a US western ski resort. Abstract presented at the biennial meeting of the International Society for Skiing Safety, San Vito di Cadore, Italy, March 2015.

Suderman B, Harley E, Stepan L, Shealy J, Scher I. Chairlift unloading success: Effects of age and equipment type on likelihood of falling. Abstract presented at the biennial meeting of the International Society for Skiing Safety, San Carlos de Bariloche, Argentina, August 2013.

Shealy J, Scher IS, Harley EM. Relationship between distances obtained while jumping versus takeoff speed and equipment used. Paper presented at the 18th International Symposium on Ski Trauma and Skiing Safety, Garmisch, Germany, April 2009.

Harley EM, Scher IS, Young DE, Shealy J. Reaction time of skiers and snowboarders. Paper presented at the 18th International Symposium on Ski Trauma and Skiing Safety, Garmisch, Germany, April 2009.

Harley EM, Trachtman D, Heckman GM, Young ED. Driver gear-shifting behaviors and errors. Paper presented at the annual meeting of the Human Factors and Ergonomics Society, New York, NY, September 2008.

Harley EM, Scher IS. The effect of visibility on chosen speed of skiers and snowboarders. Paper presented at the 17th International Symposium on Ski Trauma and Skiing Safety, Aviemore, Scotland, May 2007.

Krauss DA, Lieberman DH, Harley EM, Grossman H, Scher I. An evaluation of perceptual experience of skiers using quantitative image processing. Paper presented at the 17th International Symposium on Ski Trauma and Skiing Safety, Aviemore, Scotland, May 2007.

Harley EM, Bouvier SE, Heckman GM, Engel SA. Figure-ground effects in V1 measured with functional MRI. Poster session presented at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 2006.

Harley EM, Engel SA. Functional MRI can measure timing of neural response with high precision. Paper presented at the Annual Interdisciplinary Conference, Jackson Hole, WY, February 2006.

Harley EM, Carr VA, Viskontas IV, Cohen MS, Engel SA. Functional MRI can measure timing of transient increases in neural response with high precision. Poster session presented at the Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005.

Bernstein DM, Harley EM, Ha A. When the past can and cannot be remembered accurately: Fluency misattribution and visual hindsight bias. Poster session presented at the annual meeting of the Psychonomic Society, Toronto, Canada, November 2005.

Harley EM, Pope WB, Villablanca P, Engel SA. Neural bases of perceptual expertise in radiologists. Poster session presented at the Annual Meeting of the Vision Sciences Society, Sarasota, FL, May 2005.



Heckman GM, Cardinal KS, Harley EM, Bouvier SE, Carr VA, Engel SA. Characterizing contrast response functions measured with rapid event-related fMRI. Poster session presented at the annual meeting of the Vision Sciences Society, Sarasota, FL, May 2005.

Cardinal KS, Harley EM, Heckman GM, Bouvier SE, Carr VA, Engel SA. Comparison of contrast response functions measured with rapid and spaced event-related fMRI designs. Poster session presented at the annual meeting of the Society for Neuroscience, San Diego, CA, October 2004.

Harley EM, Carlsen KA, Loftus GR. Hindsight is 20/20: Visual hindsight bias in celebrity-face identification. Paper presented at the Biennial Meeting of the Society for Applied Research in Memory and Cognition, Aberdeen, Scotland, July 2003.

Harley EM, Bernstein DM, Loftus GR. Visual hindsight bias in object and face recognition. Poster session presented at the annual meeting of the Psychonomic Society, Kansas City, MO, November 2002.

Harley EM, Loftus GR. Is hindsight 20/20?: Evidence for hindsight bias in visual perception. Paper presented at the Annual Interdisciplinary Conference, Jackson Hole, WY, February 2002.

Harley EM, Carlsen KA, Loftus GR. Is hindsight 20/20?: Evidence for hindsight bias in visual perception. Poster session presented at the annual meeting of the Psychonomic Society, Orlando, FL, November 2001.

Harley EM, Loftus GR. Visual hindsight bias: The “seen it all along” effect. Paper presented at the Annual Meeting of the Northwest Cognition and Memory Society, Vancouver, BC, Canada, May 2001.

Harley EM, Loftus GR. A universal contrast effect in information-acquisition tasks. Paper presented at the Annual Meeting of the Northwest Cognition and Memory Society, Bellingham, WA, May 2000.

Harley EM, Loftus GR. Stimulus degradation and memory. Paper presented at the Annual Interdisciplinary Conference, Jackson Hole, WY, January 2000.

Harley EM, Loftus GR. A constant effect of stimulus contrast across very different stimulus-task combinations. Paper presented at the Annual Meeting of the Psychonomic Society, Los Angeles, CA, November 1999.

Harley EM, Loftus GR. MATLAB and graphical user interfaces. Paper presented at the Annual Meeting of the Society for Computers in Psychology, Los Angeles, CA, November 1999.

Selected Invited Presentations

Harley EM. The science of human memory and attention. Invited main workshop presenter at the 40th Annual Arson Seminar, hosted by the New York State Academy of Fire Science, Montour Falls, NY, November 2014.



Harley EM. Bias and memory distortion. Invited teaching lecture at University of California, Los Angeles, CA, June 2007.

Harley EM. Mental imagery. Invited teaching lecture at University of California, Los Angeles, CA, January 2007.

Harley EM. Hindsight bias in non-verbal domains. Invited talk at the International Hindsight Workshop, Leipzig, Germany, July 2005.

Harley EM. Is hindsight 20/20?: Demonstrations of hindsight bias in visual identification tasks. Invited talk at University of California, Riverside, CA, October 2004.

