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Engineering & Scientific Consulting

## Caroline Crump, Ph.D.

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### Professional Profile

Dr. Crump specializes in examining factors that affect human information processing and reaction time, such as attention and distraction, visual, auditory, and olfactory processing, stress and fatigue, memory and experience, and physiological conditions. Dr. Crump has applied her expertise to analyses of safety and compliance with warnings, guards, and use of personal protective equipment (PPE); consumer purchase decisions; behavior in emergencies such as transportation accidents, shootings, and fires; use of in-vehicle technologies and alerts, including Advanced Driver Assistance Systems (ADAS); slips, trips, missteps, and falls; and children's interactions with traffic and household hazards.

Dr. Crump graduated from UCLA with a Ph.D. in Psychology, emphasizing Cognitive Neuroscience. She subsequently completed postdoctoral training at the Semel Institute for Neuroscience and Human Behavior at UCLA. In her time at UCLA, she studied visual perception, attention, reaction time, and the effects of stressful/emotional stimuli on information-processing, in both non-psychiatric and clinically depressed populations. Through her training and research, Dr. Crump is skilled in the design, execution, and evaluation of studies that involve retrospective analyses of large-scale databases, human subjects testing, on-road testing, eye-tracking analyses, survey questionnaires, and observational methodologies.

### Academic Credentials & Professional Honors

Ph.D., Psychology, University of California, Los Angeles (UCLA), 2012

M.S., Psychology, University of California, Los Angeles (UCLA), 2009

B.A., Psychology, University of California, San Diego, 2007

Postdoctoral Fellowship, University of California, Los Angeles, 2012-2013

Ruth L. Kirchstein National Research Service Award, National Institutes of Health, 2012

### Licenses and Certifications

Certified XL Tribometrist (CXLT)

### Academic Appointments

Instructor, University of California, Los Angeles, Department of Psychology, 2011

Teaching Fellow, University of California, Los Angeles, Department of Psychology, 2008-2012

Teaching Fellow, University of California, Los Angeles, Department of Communication Studies, 2010-2012

## Professional Affiliations

Human Factors and Ergonomics Society

Society for Neuroscience

Society of Automotive Engineers

## Publications

Crump C, Walenchok S, Johnson C, Pauszek J, Young D. Stress, operator error, and transportation accidents. In press.

Zimmermann J, King D, Crump C. Battery-related injuries in children and adults. Proceedings, Human Factors and Ergonomics Society 2020; 64(1).

Krake A, Jonas R, Hoyos C, Crump C, Lester B, Cades D, Harrington R. Effects of training on learning and use of an Adaptive Cruise Control system. SAE Technical Paper 2020-01-1033.

Brinkerhoff R, Crump C, Jonas R, Krake A, Cloninger C, Cades DM, Young D. Driver visual errors in automobile crashes at four-way intersections. TRB Annual Meeting, 2020.

Crump C, Bui Y. Speeds of child cyclists. SAE Technical Paper 2019-01-0419, 2019.

Hoyos C, Lester BD, Crump C, Cades DM, Young D. Consumer perceptions, understanding, and expectations of Advanced Driver Assistance Systems (ADAS) and vehicle automation. Proceedings, Human Factors and Ergonomics Society 2018; 61(1):1888-1892.

Jonas R, Crump C, Brinkerhoff R, Krake A. et al. Variability in circumstances underlying pedal errors: An investigation using the National Motor Vehicle Crash Causation Survey. SAE Technical Paper 2018-01-0493, 2018, doi:10.4271/2018-01-0493.

Crump C, Brinkerhoff R, Young D. Passenger seat belt usage rates on shuttle buses. Proceedings, Human Factors and Ergonomics Society 2017; 1674-1678

Cades DM, Carey MR, Crump C, Cloninger C, Young D. Drivers and driverless vehicle revolution: understanding the changing role of the driver. Westlaw Journal Automotive 36 (24), May 31, 2017.

Sharpe SS, Brinkerhoff R, Crump C, Young D. Accelerator-to-brake transition movements during on-road stopping in an older population. SAE Technical Paper 2017-01-1396.

Moorman H, Niles A, Crump C, Krake A, Lester B, Milan L et al. Lane-keeping behavior and cognitive load with use of Lane Departure Warning. SAE Technical Paper 2017-01-1407, 2017. doi: 10.4271/2017-01-1407.

Cades DM, Crump C, Cloninger, C, Young, D. Drivers and the driverless vehicle revolution: Understanding the changing role of the driver. Article presented at the Defense Research Institute's Product Liability Meeting, 2017, Las Vegas, NV.

Crump C, Krake A, Lester BD, Moorman HG, Cades DM, Young D. Driver behavior with passive and

active vehicle safety systems. TRB Annual Meeting, 2017.

Leuchter AF, Hunter AM, Jain FA, Tartter M, Crump C, Cook IA. Escitalopram but not placebo modulates brain rhythmic oscillatory activity in the first week of treatment of Major Depressive Disorder. *J Psychiatr Res* 2017; 84:174-183.

Crump C, Cades, D, Lester B, Reed S, Barakat B, Milan L, Young D. Differing perceptions of Advanced Driver Assistance Systems (ADAS). *Proceedings, Human Factors and Ergonomics Society* 2016; 60(1):861-865.

Cades D, Crump C, Lester B, Young D. Driver distraction and Advanced Vehicle Assistive Systems (ADAS): Investigating effects on driver behavior. In NA Stanton et al (Eds) *Advances in Human Aspects of Transportation*. 2016.

Kim R, Crump C, Harley E, Nauhaus G, Yigit-Elliott S. Store-related injuries to children and adults. *Proceedings, Human Factors and Ergonomics Society Annual Meeting* 2015; 59(1):1457-1461.

Barakat B, Crump C, Cades D, Rauschenberger R, Schwark J, Hildebrand E, Young D. Eye tracking evaluation of driver visual behavior with a Forward Collision Warning and Mitigation system. *Proceedings, Human Factors and Ergonomics Society Annual Meeting* 2015; 59(1):1321-1325.

Crump C, Cades D, Rauschenberger R, Hildebrand E, et al. Driver reactions in a vehicle with collision warning and mitigation technology. *SAE Technical Paper* 2015-01-1411, 2015. doi:10.4271/2015-01-1411.

Jain FA, Cook IA, Leuchter AF, Hunter AM, Davydov DM, Ottaviani C, Tartter M, Crump C, Shapiro D. Heart rate variability and treatment outcome in major depression: A pilot study. *International Journal of Psychophysiology* 2014; 93:204-210.

Crump C, Cades D, Rauschenberger R, Hildebrand EA, Young DE. Dynamic on-road method for evaluation of Advanced Driver Assistance System (ADAS). *Proceedings, 3rd Annual World Conference of the Society for Industrial and Systems Engineering*, pp. 77-81, San Antonio, TX, October 20-22, 2014. ISBN: 97819384960-2-8.

Crump CM, Kishore SA, Zaidel E. Focus on the positive: Anxiety modulates the effects of emotional stimuli on hemispheric attention. *Brain & Cognition* 2013; 83:52-60. doi: 10.1016/j.bandc.2013.06.006

## **Presentations**

Nauhaus, G, Crump C, Williams P, Akpan I, Frazier K. Eyewitness News: How science can help you understand and reduce bias in eyewitness testimony. Presentation at the Federation of Defense & Corporate Council Annual Meeting, White Sulphur Springs, WV, 2021.

Crump C, Sundberg J. Decontaminating memories: Using science to understand reduce bias in witness accounts. Webinar presented at the Missouri Organization of Defense Lawyers Annual Meeting, 2021.

Weiss S, Roberts MA, Crump C. We have COVID-19 vaccines, now what? Making workplace decisions in a rapidly changing environment. Webinar presented for Exponent Live, 2021.

Kuykendal M, Crump C. Lithium-ion battery failures, human error, and mitigating future risks. Webinar presented for the Product Liability Advisory Council, 2020.

Roberts M, McLean S, Lively E, Crump C. COVID-19 risk mitigation in the workplace: Human factors, integrated technology, and planning for the future. Webinar presented for the National Association of Manufacturers, 2020.

Crump C, Baker-Reis N. Eight tips for retaining an expert, even during COVID-19. Webinar presented for mylawCLE, 2020.

Nauhaus G., Crump C. Eyewitness News: How science can help you understand and reduce bias in eyewitness testimony. Webinar presented at the Tennessee Defense Lawyers Association Annual Meeting, 2020.

Roberts M, Lively E, McLean S, Pooley M, Scott G, Crump C. Critical decision-making and COVID-19: Contact tracing, temperature checks and human factors in the workplace. Webinar presented for Exponent Live, 2020.

Nauhaus G., Crump C. Eyewitness News: How science can help you understand and reduce bias in eyewitness testimony. Webinar presented for Exponent Live, 2020.

Crump C. Twitter, teens, & training: Ensuring consumer safety in the age of disinformation. Webinar presented for the Product Liability Advisory Council, 2019.

Crump, C. Understanding odors, cracks, and mold during or after remediation. Presentation at the First Party Claims Conference, Warwick, RI, 2018.

Benight S, Harrington R, Crump C, Law HG. Navigating the legal landscape of highly automated vehicles. Panel presentation for the Bar Association of San Francisco, San Francisco, CA, 2018.

Crump C. "Self-driving" cars and human operators. Presentation at the Texas Association of Defense Counsel 2018 Annual Meeting, San Francisco, CA, 2018.

Brinkerhoff R, Crump C, Nauhaus G. The impact of natural shadows on visibility. 9th International Conference on Applied Human Factors and Ergonomics, Orlando, FL, July, 2018.

Crump C, Brinkerhoff R, Young D. Passenger seat belt usage rates on shuttle buses. Presentation at the Human Factors and Ergonomics Society Annual Meeting, Austin, TX, 2017.

Crump C, Krake A, Lester BD, Moorman HG, Cades DM, Young D. Driver behavior with passive and active vehicle safety systems. Poster presented at the Transportation Research Board Annual Meeting, Washington, D. C., 2017.

Crump, C. Risk assessment and user compliance with safety information. Presentation at the Central Texas Product Safety Engineering Society, Austin, TX, 2016.

Crump, C. Risk assessment and user compliance with safety information. Presentation at the IEEE Symposium on Product Compliance Engineering, Anaheim, CA, 2016.

Crump, C. Human factors implications of Active Safety Systems. Presentation at the Society of Automotive Engineers Active Safety Systems Symposium, Plymouth, MI, 2015.

Kim R, Crump C, Harley E, Nauhaus G, Yigit-Elliott S. Store-related injuries to children and adults. Presentation at the Human Factors and Ergonomics Society Annual Meeting, Los Angeles, CA, 2015.

Crump C, Cades D, Rauschenberger R, Hildebrand EA, Young DE. Dynamic on-road method for evaluation of Advanced Driver Assistance System (ADAS). Presentation at the 3rd Annual World Conference of the Society for Industrial and Systems Engineering, San Antonio, TX, 2014.

McCaa M, Crump CM, Zaidel E. Hemispheric attention: A preliminary analysis of the effect of emotional context and cue. Poster presented at the Psychology Undergraduate Research Conference, Los

Angeles, CA, 2012.

Abeson K, Crump CM, Zaidel E. The mask of sinistrality: Left-handedness reduces the cognitive effects of anxiety. Poster presented at the Psychology Undergraduate Research Conference, Los Angeles, CA, 2012.

Gobrial M, Crump CM, Zaidel E. The effects of anxiety on Inhibition of Return. Poster presented at the Psychology Undergraduate Research Conference, Los Angeles, CA, 2010.

Zelaya J, Crump CM, Zaidel E. Is the N170 sensitive to emotions in facial stimuli? Poster presented at the Stanford Undergraduate Psychology Conference, Stanford, CA, 2010.

Crump CM, Zaidel E. Anxiety affects luminance discrimination in the right hemisphere. Poster presented at the Cognitive Neuroscience Society Annual Meeting, San Francisco, CA, 2009.

Crump CM, Kishore SA, Mezina A, Zaidel E. Anxiety modulates the effects of emotion on spatial orienting. Poster presented at The Neuroscience of Emotion Conference, Medford, MA, 2009.

Crump CM, Zaidel E. Anxiety level modulates attention bias in the lateralized dot probe task. Poster presented at the Society for Neuroscience Conference, Chicago, IL, 2009.