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Engineering & Scientific Consulting


## Chris Monk, Ph.D.

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## Professional Profile

Dr. Monk is an internationally recognized expert on driver inattention, in-vehicle human-machine interfaces, in-vehicle warnings and alerts, driving human factors, and driver behavior. In addition, his past experience as head of human factors at the National Highway Traffic Safety Administration (NHTSA) equips him to address vehicle systems issues with advanced driving assistance systems (ADAS) and automated vehicle systems, including the development of safety assessment tools, regulatory test procedures, functional safety requirements, regulatory support analyses, and research with federal crash and fatalities databases.

Dr. Monk also works on issues related to heavy trucks, alcohol and drowsy impaired driving, pedestrians, vehicle lighting, nighttime driving, traffic control devices, seat belts, and Americans with Disabilities Act (ADA) compliance assessments. Dr. Monk's unique background in the federal government, automotive industry, academia, and consulting allows him to provide invaluable insights, guidance, and support to clients on a range of driver performance and regulatory questions in conventional vehicles, ADAS, and automated vehicles.

Beyond the driving domain, Dr. Monk has also used his extensive experience in human cognition, attention, perception, and performance to investigate issues related to product warnings, hazard identification and avoidance in premises issues (e.g., slips, trips, and falls), and cybersecurity and financial frauds and scams (i.e., the psychology of scam compliance).

Dr. Monk has led both large-scale research programs and individual studies investigating driver distraction, automation human factors, warning design, electronic systems safety, functional safety, and emerging technologies for the federal government and industry clients and has extensive experience in partnering with industry to accomplish research and regulatory objectives. In his role as head of human factors at NHTSA, he had the opportunity to speak before the White House, the Secretary of Transportation, and NHTSA political leadership on a range of vehicle safety topics, and was called upon by leadership to represent NHTSA's positions and research to the National Transportation Safety Board, the General Services Administration, and the US Department of Defense.

Prior to joining Exponent, Dr. Monk was the Human Factors Division Chief in NHTSA's Office of Vehicle Crash Avoidance & Electronic Controls Research, where he also served as Acting Division Chief for the Electronic Systems Controls division. Prior to NHTSA, Dr. Monk was the Human Factors Team Leader at the Federal Highway Administration. Before that, he was an Assistant Professor of Human Factors Psychology at George Mason University in Fairfax, VA. He began his career as a human factors engineer for Toyota where he led the development of the driver-vehicle interface for the first-generation Lexus in-vehicle navigation system.

 

## Academic Credentials & Professional Honors

Ph.D., Psychology, George Mason University, 2004

M.A., Human Factors Psychology, California State University, Northridge, 1997

B.A., Psychology and Philosophy, University of California, Santa Barbara, 1992

Superior Accomplishment Award, National Highway Traffic Safety Administration, 2017

Gold Medal Outstanding Achievement Award – FAST Act Team, US Dept. of Transportation, 2016

Partnering for Excellence Award - Smart City Challenge Team, US Dept. of Transportation, 2016

Partnering for Excellence Award – NHTSA Rose Garden Team, US Dept. of Transportation, 2016

Superior Accomplishment Team Award - Phase 2 Distraction Guidelines, National Highway Traffic Safety Administration, 2016

Superior Performance in Management Award, National Highway Traffic Safety Administration, 2015

## Academic Appointments

Assistant Professor, Department of Psychology, George Mason University, 2005-2010

## Prior Experience

Human Factors Research Division Chief, National Highway Traffic Safety Administration, 2011–2019

Human Factors Team Leader, Federal Highway Administration, 2010-2011

Assistant Professor, George Mason University, 2005-2010

Senior Human Factors Researcher, WESTAT, 2005

Research Psychologist, Science Applications International Corporation, 1998-2004

Human Factors Engineer, Toyota Technical Center, USA, Inc., 1994-1997

## Professional Affiliations

Member, Society of Automotive Engineers, 2020-present

Past U.S. Co-Chair, Human Factors Working Group under the U.S. Department of Transportation's (USDOT) Trilateral Agreement with the European Commission and Japan on Intelligent Transportation Systems

Past Chair, USDOT Human Factors Coordinating Committee

Past Member, USDOT Smart City Evaluation Team

Past Member, USDOT FAST-Act Implementation Team

Past Member, USDOT Distraction Team

Past Chair, Transportation Research Board (TRB) Human Factors Workshop Committee

Past Member, current Affiliate, TRB User Characteristics Committee (ACH30)

Affiliate, TRB Simulation and Measurement of Vehicle and Operator Performance Committee (ACH)

Past Member, TRB Human Factors Guidelines for Road Systems Subcommittee (ACH40(2))

Past Member, TRB Digital Billboards Joint Subcommittee

Member, Human Factors and Ergonomics Society (HFES), 1998-Present

Member, HFES Surface Transportation Technical Group

Past Chair, HFES Surface Transportation Technical Group

Past Program Chair, HFES Surface Transportation Technical Group

Member, HFES Forensics Professional Technical Group

## Publications

Calvo, J. A., Eisert, J., Sandt, L., Kidd, D., Monk, C., Dadashova, B., & Klauer, C. (2023). Driving automation and vulnerable road users: peanut butter & jelly or oil & water?. In Proceedings of the Human Factors and Ergonomic Society annual meeting (Vol. 67, No. 1, pp. 2530-2533). SAGE Publishing.

Yu, D., Nasir, M., Pitts, B. J., Shutko, J., Bao, S., & Monk, C. (2023). L3 vehicles are becoming a reality: important human factors consideration for the viability of conditional automation. In Proceedings of the Human Factors and Ergonomic Society annual meeting (Vol. 67, No. 1, pp. 1285-1288). SAGE Publishing.

Monk, C., Sall, R., Lester, B. D., Higgins, J. S. (2023). Visual and cognitive demands of manual and Voice-based driving mode implementations on smartphones. Accident Analysis & Prevention, 187, 107033.

Merat, N., Seppelt, B., Louw, T., Engström, J., Lee, J.D., Johansson, E., Green, C., Katazaki, S., Monk, C., Itoh, M., McGehee, D., Sunda, T., Unoura, K., Schieben, A., and Keinath, A. The "Out-of-the-Loop" Concept in Automated Driving: Proposed definition, measures and implications. Cognition, Technology, & Work 2019; 21, 87-98.

Allahyar, M., Becic, E., Chappell, S., Fisher, D., Lohrenz, M., Monk, C., & Philips, B. The evolving role of automation in transportation: Human factors lessons learned from the different modes. In the Proceedings of the 2016 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Fisher, D., Nodine, E., Lam, A., Jerome, C., Monk, C., & Najm, W. Effects on Drivers' Behavior of Forward Collision Warning System Alerts. In the Proceedings of the 2016 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Jerome, C., Monk, C., & Campbell, J. Driver vehicle interface design assistance for vehicle-to-vehicle technology applications. In the Proceedings of the 2015 International Technical Conference on the Enhanced Safety of Vehicles (ESV), Gothenburg, Sweden.

Vegega, M., Jones, B., & Monk, C. Understanding the effects of distracted driving and developing strategies to reduce resulting deaths and injuries: A report to congress. (2013; Report No. 812 053). Washington, DC: National Highway Traffic Safety Administration.

Engström, J., Monk, C., Hanowski, R.J., Horrey, W.J., Lee, J.D., McGehee. D.V., Regan, M., Stevens, A., Traube, E., Tuukkanen, M., Victor, T., & Yang, C.Y.D. A conceptual framework and taxonomy for understanding and categorizing driver inattention. 2013; Brussels, Belgium: European Commission.

Höfs, W., Lappin, J., Schagrin, M., et al. International Deployment of Cooperative Intelligent Transportation Systems− Bilateral Efforts of the European Commission and United States Department of Transportation. (2012; Report no. FHWA-JPO-12-081). Washington, DC: Federal Highway Administration.

Neiderman, E., Popkin, S. Donovan, C., Philips, B., Chappell, S., & Monk, C. Transportation research into practice: a multi-agency government perspective. In the Proceedings of the 2012 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Cades, D. M., Boehm-Davis, D. A., Trafton, J. G., & Monk, C. A. Mitigating disruptive effects of interruptions through training: What needs to be practiced? Journal of Experimental Psychology: Applied 2011; 17(2), 97-109.

Coplen, M., Donovan, C., Hallquist, T., Monk, C., Popkin, S., Traube, E. United States Department of Transportation (DOT) Human Factors Coordinating Committee (HFCC) Research Needs. In the Proceedings of the 2011 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Robinson E, Lerner N, Jenness J, Singer J, Huey R, Baldwin C, Kidd D, Roberts D, & Monk C. Crash Warning Interface Metrics Task 3 Report: Empirical Studies of Effects of DVI Variability, (2011; Report no. 811 470b). Washington, DC: National Highway Traffic Safety Administration.

Binder, S., Monk, C., Engström, J., Hanowski, R, Horrey, W.J., Lee, J., Regan, M, Stevens, A., and Victor, T. Expert Focus Group on Driver Distraction: Definition and Research Needs. US-EU Bilateral ITS Technical Task Force, 2011, Berlin, Germany.

Hunter, D. R., Monk, C. A., & Hurwitz, E. Effects of a Motion-Coupled Visual Display on Motion Sickness and Task Performance. In the Proceedings of the 2009 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Kidd, D. G., & Monk, C. A. Are unskilled drivers aware of their deficiencies? How driving skills influence the accuracy of driving performance estimates. In the Proceedings of the 2009 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Monk, C. A., & Nelson, E. Undershoot Bias in Lead-Vehicle Motion Extrapolation. In the Proceedings of the 2009 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Salvucci, D. D., Monk, C. A., Trafton, J. G. A Process-Model Account of Task Interruption and Resumption: When Does Encoding of the Problem State Occur? In the Proceedings of the 2009 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Kidd, D. G., & Monk, C. A. The effects of dual-task interference and response strategy on stop or go decisions to yellow light changes. Proceedings of the 5th International Symposium on Human Factors in Driving Assessment, Training, and Vehicle Design 2009, Bozeman, MT.

Barrow, J., Cades, D., Kidd, D., Nelson, E., Roberts, D., & Monk, C. SLIC: Speed Limits for Inclement Conditions. Poster in Stuttgart, Germany as part of the 2009 ESV International Competition Finals.

Kidd, D., Cades, D., Horvath, D., Jones, S., Pitone, M., & Monk, C. Driver Distracted: Do Voice Recognition Systems help Drivers Focus on the Road? User Experience 2008; 7, 10-12.

Monk, C. Driver interrupted: Recovering from Unexpected Lane Drifts. Presentation at the 2008 American

Psychological Association Annual Meeting. Boston, MA.

Monk, C. Driver interrupted: The costs of shifting attention while driving. Presentation at the 2008 Meeting of the Washington Academy of Sciences, Arlington, VA.

Monk, C. A., Trafton, J. G, & Boehm-Davis, D. A. The effect of interruption duration and demand on resuming suspended goals. Journal of Experimental Psychology: Applied 2008; 14, 299-313.

Monk, C. A., & Kidd, D. G. Driver visual occlusion and lane drift recovery. Washington Academy of Sciences Journal 2008; 94, 79-92.

Cades, D. M., Werner, N., Trafton, J. G., Boehm-Davis, D. A., and Monk, C. A. Dealing with Interruptions Can Be Complex, But Does Interruption Complexity Matter: A Mental Resources Approach to Quantifying Disruption. Proceedings of the 2008 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Monk, C. A. & Kidd, D. G. The Effects of Brief Interruptions on Task Resumption. In the Proceedings of the 2008 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Monk, C. A. & Kidd, D. G. Recovering from Unexpected Lane Drifts. In the Proceedings of the 2008 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Trafton, J. G. & Monk, C. A. Task Interruptions. Reviews of Human Factors and Ergonomics 2007; 3, 111-126.

Cades, D. M., Trafton, J. G., Boehm-Davis, D. A., and Monk, C. A. Does the Difficulty of an Interruption Affect our Ability to Resume? Proceedings of the 2007 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Kidd, D. G., & Monk, C. A. More is less: The effect of single and multiple interleaved interruptions on task resumption. Proceedings of the 2007 Human Factors and Ergonomics Society Annual Meeting. Santa Monica, CA: HFES.

Monk, C. A., & Kidd, D. G. R we fooling ourselves: Does the occlusion technique shortchange R estimates? Proceedings of the 2007 Driving Assessment conference.

Lerner, N. D., Huey, R. Singer, J., & Monk, C. A. Driver Feedback Device for Passive Railroad Grade Crossings. Safety IDEA Program Project Final Report, 2006. Washington, DC.

Goodman, M.J., Barker, J., and Monk, C. A Bibliography of Research Related to the Use of Wireless Communications Devices from Vehicles. 2005; Washington, DC: U.S. Department of Transportation National Highway Traffic Safety Administration.

Monk, C. A., Boehm-Davis, D. A., & Trafton, J. G. Recovering from interruptions: Implications for driver distraction research 2004; Human Factors, 46, 650-663.

Monk, C., Goodman, P., and Moyer, M. J. Capabilities of the FHWA High-Fidelity Driving Simulator (HYSIM). 2001 Human Centered Transportation Simulation Conference. Iowa City, IA: University of Iowa.

Lee, S., Wierwille, W., Schreiner, C., Moyer, J., and Monk, C. Operational review of the ALERT law enforcement vehicle interface. Proceedings of the Intelligent Transportation Society 2001 Annual Meeting, Washington, DC: ITS America.

Monk, C., Moyer, J., Hankey, J., Dingus, T., Hanowski, R., and Wierwille, W. Design evaluation and model of attention demand (DEMAnD): A tool for in-vehicle information system designers. Public Roads 2000; 64(3), 10-14, Federal Highway Administration, Washington, D.C.

Monk, C. and Moyer, J. The customer-driven development of human factors design guidelines. Public Roads 2000; 63(4), 2-6, Federal Highway Administration, Washington, D.C.

Hankey, J., Dingus, T., Hanowski, R., Wierwille, W., Monk, C., and Moyer, J. The development of a design evaluation tool and model of attention demand. Driver Distraction Internet Forum, 2000. National Traffic Safety Administration, Washington, D.C.

Campbell, J., Carney, C., Monk, C., Granda, T., and Lee, J. Design guidelines for in-vehicle icons. Proceedings of the Intelligent Transportation Society 2000 Annual Meeting. Washington, DC: ITS America.

## Peer Reviews

Human Factors

Accident Analysis and Prevention

Transportation Research Part F

Traffic Injury Prevention

International Journal of Human - Computer Studies

Journal of Intelligent Transportation Systems: Technology, Planning, and Operations

Applied Cognitive Psychology

Human Robot Interaction

Sustainability