Exponent®
Engineering & Scientific Consulting

Mary Aldugom, Ph.D.

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Professional Profile

Dr. Mary Aldugom is a human factors scientist with expertise in cognition, information processing, learning, attention and distraction, visual perception, decision making, and perception response time. At Exponent, Dr. Aldugom applies this expertise to the investigation of motor vehicle accidents, slips, trips, and falls, and compliance with safety information and warnings. Dr. Aldugom has evaluated driver and pedestrian behaviors across a variety of transportation contexts, including the use and understanding of in-vehicle technologies such as Advanced Driver Assistance Systems (ADAS), and has performed evaluations of consumer product safety information, including warnings and instructions. Dr. Aldugom also specializes in the design, execution, and analysis of human subjects studies and surveys.

Prior to joining Exponent, Dr. Aldugom was a graduate research assistant in the Communication, Cognition, and Learning Lab at the University of Iowa. Dr. Aldugom's research examined how hand gestures in instructional contexts guide visual attention and support learning. Her research assessed attention, working memory, learning, and spatial abilities in both children and adults, and she has experience analyzing qualitative and quantitative human subjects data. Dr. Aldugom also had appointments at the University of Iowa's Center for Teaching, where she translated cognitive science research for broad audiences and developed content on adult learning theory to promote effective learning across campus. After graduate school, Dr. Aldugom was an assistant professor at Chicago State University, where she taught courses in introduction to psychology, research methods, scientific writing, and data analysis and visualization in *R*. Dr. Aldugom continues to guest lecture at various institutions and has ongoing research collaborations.

Academic Credentials & Professional Honors

Ph.D., Psychology, University of Iowa, 2022

M.A., Psychological and Brain Sciences, University of Iowa, 2018

B.S., Psychology, North Park University, 2015

First-Generation Student Achievement Award, University of Iowa, 2021

Diversity Catalyst Award, Division of DEI, University of Iowa, 2020

Distinguished Senior Award, North Park University, 2015

Most Outstanding Senior in Psychology Award, North Park University, 2015

Psychology Departmental Scholar Award, North Park University, 2014-2015

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Academic Appointments

Assistant Professor, Department of Psychology and Counseling, Chicago State University, 2022-2023

Learning Model P3 Graduate Assistant, Center for Teaching, University of Iowa, 2021-2022

Graduate Teaching Fellow, Center for Teaching, University of Iowa, 2019-2020

Graduate Research Assistant, Department of Psychological and Brain Sciences, University of Iowa, 2016-2022

Graduate Teaching Assistant, Department of Psychological and Brain Sciences, University of Iowa, 2016-2022

Prior Experience

Assistant Professor, Department of Psychology and Counseling, Chicago State University, 2022-2023

Professional Affiliations

Human Factors and Ergonomics Society – 2024 – Present

Psychonomic Society – 2016 – Present

International Society for Gesture Studies – 2017 – 2023

Cognitive Science Society – 2016 – 2023

Publications

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.

Cook, S. W., Wernette, E. M., Valentine, M., Aldugom, M., Pruner, T., & Fenn, K. M. (2024). How prior knowledge, gesture instruction, and interference after instruction interact to influence learning of mathematical equivalence. Cognitive science, 48(2), e13412.

Zbaracki, J., Mistak, A., Aldugom, M., Pruner, T., Fenn, K., & Cook, S. W. (2023). The influence of instruction with hand gesture on children's visual attention after instruction. In Proceedings of the Annual Meeting of the Cognitive Science Society (Vol. 45, No. 45).

Aldugom, M., Fenn, K., Day, A., & Cook, S. W. (2021). The Role of Verbal and Visuospatial Working Memory in Supporting Mathematics Learning With and Without Hand Gesture. In Proceedings of the Annual Meeting of the Cognitive Science Society (Vol. 43, No. 43).

Aldugom, M., Fenn, K., & Cook, S. W. (2020). Gesture during math instruction specifically benefits learners with high visuospatial working memory capacity. Cognitive Research: Principles and Implications, 5(1), 1-12.

Presentations

Aldugom, M. (2022). Exploring the Underlying Mechanisms of the Beneficial Effect of Gesture on Mathematical Learning. Talk presented at Chicago State University's Faculty Research and Creative Activities November Session, Chicago, IL

Aldugom, M. & Cook, S. W. (2022). Does the Effect of Gesture Generalize Across Instructional Formats? Talk presented at the 9th Conference of the International Society for Gesture Studies, Chicago, Illinois, USA.

Aldugom, M. & Cook, S. W. (2022). Does the Amount of Instruction Influence the Benefit of Learning with Gesture? Poster presented at the 9th Conference of the International Society for Gesture Studies, Chicago, Illinois, USA.

Zbaracki, J., Mistak, A., Aldugom, M., Pruner, T., Fenn, K., Cook, S. W. (2022). Investigating student process through eye-tracking in learning tasks with gesture. Poster presented at the 9th Conference of the International Society for Gesture Studies, Chicago, Illinois, USA.

Aldugom, M., Fenn, K., Day, A., & Cook, S. W. (2021). The Role of Verbal and Visuospatial Working Memory in Supporting Mathematics Learning With and Without Hand Gesture. Poster presented at the Annual Meeting of the Cognitive Science Society.

Aldugom, M., Cook, S. W. (2020). Is Gesture Effective Across Presentation Types of the Same Mathematical Concept? Poster presented at Psychonomic Society's 60th Annual Meeting.

Aldugom, M., Cook, S. W. (2019). Does Gesture Support Mathematical Learning in an Online Learning Environment? Poster presented at Psychonomic Society's 60th Annual Meeting, Montreal, Quebec, Canada.

Aldugom, M., Fenn, K., Cook, S. W. (2018). Individual Differences in Visuospatial Working Memory Predict Learning From Gesture in a Mathematical Task. Poster presented at Psychonomic Society's 59th Annual Meeting, New Orleans, LA, USA.

Aldugom, M., Fenn, K., Cook, S. W. (2018). How Do Individual Differences in Working Memory Predict Learning with Gesture? Poster presented at The DeLTA Center and The College of Education's 1st Annual Meeting, Iowa City, IA, USA.

Aldugom, M., Cook, S. W. (2017). How Do Individual Differences in Working Memory Predict Learning with Gesture? Poster presented at Psychonomic Society's 58th Annual Meeting, Vancouver, B.C., Canada.