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KELLY N BYRNE, PHD
Human Factors Scientist

Dr. Kelly Byrne is a Human Factors Scientist at Guidance Engineering and Applied Research. In her work, Dr. Byrne utilizes her specialized knowledge of visual perception, cognition, perception response time, decision-making, and human subjects research to address human factors and performance issues. She applies her expertise to the analysis of driver/pedestrian perception and behavior, visibility and lighting, task performance, risk communication and warning compliance, and consumer choice. Dr. Byrne has analyzed human factors issues in transportation (e.g., vehicle, micromobility, pedestrian, and rail accidents), recreational sports, product liability, and premises liability cases including auto/pedestrian accidents, industrial/occupational accidents, driver gearshift and pedal errors, trips and falls, and fires, among others. Dr. Byrne has also published and presented scientific research pertaining to both typical and atypical visual perception, pedestrian behavior, and the effects of attention, expectation, and drug and alcohol use on human information processing and performance.

Dr. Byrne earned her Ph.D. in vision science at the University of California, Berkeley, where she also served as a graduate student instructor and lecturer. There, Dr. Byrne utilized a combination of psychophysics, behavioral pharmacology, eye-tracking, and neuroimaging to quantify and characterize plasticity in the human visual system. Specifically, her graduate work focused on the relationships between attention, visual perceptual learning, and chemical transmission in the brain. Additionally, Dr. Byrne has taught courses in neuroscience, optometry, and scientific writing to high-school, undergraduate, and graduate students. Dr. Byrne also has extensive experience in scientific communication to lay audiences. Through her ongoing work in STEM advocacy and outreach, Dr. Byrne has been invited to speak about her research and mentorship experience by several organizations including the National Student Leadership Conference, Mentoring in Medicine & Science, and Bay Area Scientists in Schools.

Academic Credentials and Professional Honors

Ph.D., Vision Science, University of California, Berkeley, 2019
B.A., Behavioral Neuroscience, Colgate University, 2011

Minnie F. Turner Memorial Award for Impaired Vision Research, 2016; Justus Liebig University Giessen Visual Neuroscience Fellowship, 2016; Berkeley Optometry Outstanding Teaching

Award, 2014 & 2015; Berkeley Fellowship for Graduate Study, 2013–2015; Colgate University Natural Sciences & Mathematics Research Fellowship, 2010

Prior Experience and Academic Appointments

Senior Scientist, Human Factors Practice, Exponent, Inc., 2020–2022

Lecturer, Daniel C. Sonderegger Perception Science Program, UC Berkeley, 2017–2019

Graduate Student Instructor, School of Optometry, UC Berkeley, 2013–2015

Research Assistant, Center for Biomedical Imaging & Neuromodulation, Nathan S. Kline Institute for Psychiatric Research, 2011–2013

Professional Affiliations

Human Factors and Ergonomics Society

Society of Automotive Engineers

Vision Sciences Society

Publications

Mukerji, A., Byrne, K. N., Yang, E., Levi, D. M., & Silver, M. A. (2022). Visual cortical γ−aminobutyric acid and perceptual suppression in amblyopia. Frontiers in Human Neuroscience, 16.

Pandey, A. K., Ardekani, B. A., Byrne, K. N. H., Kamarajan, C., Zhang, J., Pandey, G., ... & Porjesz, B. (2022). Statistical Nonparametric fMRI Maps in the Analysis of Response Inhibition in Abstinent Individuals with History of Alcohol Use Disorder. Behavioral Sciences, 12(5), 121.

Phillips, K. B., Byrne, K. N., Kolarik, B. S., Krake, A. K., Bui, Y. C., & Krauss, D. A. (2021). Impacts of social distancing on pedestrian behavior and risk perception. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 65, No. 1, pp. 1302-1306). Sage CA: Los Angeles, CA: Sage Publications.

Byrne, K. N., McDevitt, E. A., Sheremata, S. L., Peters, M. W., Mednick, S. C., & Silver, M. A. (2020). Transient cholinergic enhancement does not significantly affect either the magnitude or selectivity of perceptual learning of visual texture discrimination. Journal of Vision, 20(6), 5-5.

Byrne, Kelly Nicole. “Cholinergic Modulation of Visual Perceptual Learning of Texture Discrimination.” eScholarship, University of California, 2019. Print.

Pandey, A. K., Ardekani, B. A., Kamarajan, C., Zhang, J., Chorlian, D. B., Byrne, K. N. H., ... & Porjesz, B. (2018). Lower Prefrontal and Hippocampal Volume and Diffusion Tensor Imaging Differences Reflect Structural and Functional Abnormalities in Abstinent Individuals with Alcohol Use Disorder. Alcoholism: Clinical and Experimental Research, 42(10), 1883-1896.

Kelly, S. D., Byrne, K., & Holler, J. (2011). Raising the ante in communication: Evidence for enhanced gesture use in high stakes situations. Information, 2, 579-593.

Published Abstracts and Conference Presentations

Byrne, K.N. & Silver, M.A. (2019). Cholinergic facilitation of visual perceptual learning of texture discrimination. Presented at the 17th annual meeting of the Vision Sciences Society.

Mukerji, A., Byrne, K.N., Yang, E., Li. L., Levi, D.M., & Silver, M.A. (2018). Influence of visual cortical GABA concentration on perceptual suppression and binocular summation in amblyopia. Society for Neuroscience Abstracts 143.20.

Byrne, K.N., Peters, M.W., McDevitt, E.A., Sheremata, S.L., Mednick, S.C., & Silver, M.A. (2017). The effects of cholinergic enhancement and consolidation duration on perceptual learning of texture discrimination. Presented at the 15th annual meeting of the Vision Sciences Society.

Mukerji, A., Byrne, K.N., Yang, E., Li. L., Levi, D.M., & Silver, M.A. (2017). Influence of visual cortical GABA concentration on perceptual suppression and binocular summation in amblyopia. Presented at the 15th annual meeting of the Vision Sciences Society.

Kamarajan, C., Ardekani, B.A., Pandey, A.K., Chorlian, D.B., Byrne, K.N., Stimus, A., & Porjesz, B. (2017). Resting State Functional Connectivity Of fMRI and EEG in Alcoholics. Presented at the 40th annual meeting of the Research Society on Alcoholism.

Pandey, A.K., Byrne, K.N., Ardekani, B.A., Kamarajan, C., Zhang, J., Chorlian, D.B., Stimus, A., & Porjesz, B. (2017). Role Of Right Hemisphere Inhibition Network Activation During Response Inhibition and its Deficiency in Alcohol Use Disorders: A Go/No-go fMRI Study. Presented at the 40th annual meeting of the Research Society on Alcoholism.

Byrne, K.N.H., Yang, E., Li, L., Levi, D.M., & Silver, M.A. (2016). Reduced binocular summation of fMRI responses to visual stimuli in ventral extrastriate cortex in anisometropic amblyopia is related to visual cortical GABA concentration. Society for Neuroscience Abstracts 48.01.

Ringer, R.V., Hansen, B.C., Byrne, K., Larson, A.M., & Loschky, L.C. (2012). Amplitude spectrum slope is more important than orientation in rapid scene categorization. Presented at the 10th annual meeting of the Vision Sciences Society.