

Ian P. Howard Memorial Lecture

Visual cortex plasticity elucidated in individuals with childhood hemispherectomy

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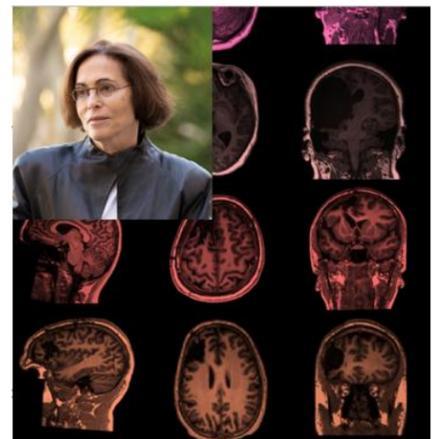
Date: Friday, April 17th, 2026

Time: 2:00 – 3:30pm

Location: TBD

Abstract

Intricately configured neural circuits mediate complex human behavior. Understanding the dynamic association between the emerging structural and functional architectures in the developing brain may provide important clues about the mechanisms by which these circuits become organized and optimized in the human brain. Moreover, elucidating the potential for plasticity of such circuits is key to gauging the boundary conditions of organization. I assess the capacity for plasticity under rather unique conditions; namely, in the single, preserved hemisphere of individuals who have undergone childhood hemispherectomy for the management of drug-resistant epilepsy. The studies address this issue primarily in the context of visual cortex but whole-brain analyses are also conducted. Through cross-sectional and longitudinal structural and functional experiments with a relatively large group of individuals and, in comparison to matched controls, I illustrate the emergence of atypical underlying neural circuits. Moreover, I show that the ensuing behavior of the patients, irrespective of whether the resection was of right or left hemisphere, is better than predicted based on brain volume alone. Together, these studies provide rough ‘upper bounds’ of the potential for neural change, and elucidate mechanisms that contribute to the evolving neural changes.



Biography

Marlene Behrmann holds the John and Clelia Sheppard Chair in the Department of Ophthalmology at the University of Pittsburgh. She studies the psychological and neural bases of visual processing, with specific attention to the mechanisms by which the signals from the eye are transformed into meaningful percepts by the brain. She adopts an interdisciplinary approach combining computational, neuropsychological and neuroimaging studies with adults and children in health and disease. For example, she has mapped the cortical visual system in patients following childhood hemispherectomy, elucidating the potential for cortical reorganization. Dr. Behrmann is a member of the Society for Experimental Psychologists, the National Academy of Sciences, and American Academy of Arts and Sciences. Among her awards are the Presidential Early Career Award for Engineering and Science, the APA Distinguished Scientific Award for Early Career Contributions and the Kavli Distinguished Career Contributions in Cognitive Neuroscience Award from the Cognitive Neuroscience Society.