

Marlene R. Cohen, Ph.D.
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2012 Winner: Marlene R. Cohen, Ph.D.

Marlene Cohen is Assistant Professor in the Department of Neuroscience and the Center for the Neural Basis of Cognition at the University of Pittsburgh. Dr. Cohen received her Ph.D. from Stanford University while working with Bill Newsome. She studied how interactions between neurons depend on how an animal is planning to use the sensory information they encode. Her postdoctoral research with John Maunsell at Harvard Medical School used visual attention as a tool to understand which aspects of a cortical population code are most important. Her group at the University of Pittsburgh uses physiological, behavioral, and computational methods to study what information groups of neurons in visual cortex transmit to downstream areas and how variability in sensory neurons affects perception.

When Attention Wanders: How Uncontrolled Fluctuations in Attention Affect Perception

No matter how hard subjects concentrate on a task, their minds wander. These internal fluctuations can greatly alter both perception and neuronal responses, but they cannot be measured behaviorally or from conventional neurophysiological measures. As a postdoctoral associate with John Maunsell, Dr. Cohen developed a method for estimating internal fluctuations using the responses of a few dozen neurons in visual cortex. She showed that fluctuations in visual attention have large and complex effects on an animal's ability to perform a simple perceptual task. The ability to measure attentional fluctuations provided new insights into how attention is controlled in the brain and the ways in which different internal fluctuations affect perception. In the future, Dr. Cohen's group plans to use these methods to study how fluctuations in attention and other cognitive states affect the computations performed in the brain and how sensory information is used to guide behavior.