# The Many Faces of "Top-down": An Integrative Perspective

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It has been known since more than two decades that the state of even early sensory cortices is heavily influenced by attention. However, only recently has it become clear that top-down effects in sensory cortex can be much richer and more complex than the attentional modulation originally described. Various cognitive factors such as reward, expectation, and decision signals conspire to shape the state of sensory cortex. Our symposium will take the visual cortex as a showcase to expose these top-down effects, from the level of single neurons over neural populations to perception and behavior. To this end, we will draw from human and monkey data, as well as from various different measurement modalities. The research highlighted by our symposium uncovers a remarkable degree of adaptability of sensory cortex. It also sheds new light on the link between the BOLD-fMRI signal and electrophysiological measures of neuronal activity.

**Learning Objectives:**
1. To understand the many faces of top-down modulations of sensory cortex.
2. To gain insights into the link between the BOLD-fMRI signal and electrophysiological activity.

**Exploring the Origin of Neuron-Behavior Correlations in Early Visual Cortex**
Hendrikje Nienborg, Werner Reichardt Center for Integrative Neuroscience, Universitaet Tuebingen Tuebingen, Germany

**Decision Signal in Visual Cortex Predicts the Stability of a Perceptual Illusion**
Tobias Donner, Department of Psychology, University of Amsterdam, Amsterdam, Netherlands

**Reward Signals Selectively Decrease fMRI Activity in Primate Visual Cortex**
Wim Vanduffel, Massachusetts General Hospital, Charlestown, United States

**Foreknowledge Automatically Biases Early Sensory Representations**
Floris de Lange, Donders Institute, Radboud University Nijmegen, Nijmegen, Netherlands