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- Friday, September 14, 2007

Attention diminishes surround suppression in Macaque area V4

The brain has a limited capacity to process incoming visual information. One mechanism to overcome this limit is visual attention which allows selected behaviorally relevant items to be processed preferentially. Visual attention has often been found to increase responses of neurons in visual cortex. Much less is known, however, about whether attention can also reduce the response of neurons to irrelevant or distractor stimuli. In this study we examined the response modulation induced by attention to a target stimulus placed within the receptive field of a V4 neuron in the presence and absence of a distracter stimulus placed near but outside the receptive field. The presence of the distracter generally suppressed the response of the neuron to the target. Attending to the target stimulus had the effect of both increasing the response of the neuron to the target as well as reducing the influence of the nearby distracter. This result cannot be explained by a model in which the response of a neuron is multiplied by a fixed attentional gain factor but is consistent with a simple model in which attention modulates the inputs to a divisive normalization circuit.

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