
Early Modulation of Perceptual Neural Activity Induced by Top-Down Social Information

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Abstract

It is generally assumed that neural perceptual processes mainly rely on bottom-up spreading of activity from sensory receptors (e.g. retina) to high-level conceptual areas. On the basis of behavioral and electroencephalogram (EEG) experiments, we will show that both behavioral and neuronal responses to stimulation induced by emotional stimuli are modulated by the presence of social information as early as 100 to 120 ms onset. Both P1 and N170 components are significantly modulated by the positive or negative valence of social information preceding the emotional target (angry, disgusted, fearful, happy, sad or surprise facial expressions). These modulations of the P1 and N170 components are accompanied by behavioral modulation in the feeling but also in the perception of the emotional stimuli. These effects suggest that social information in an emotional target can induce early neuronal modulation at the level of perceptual extrastriate cortex (P1 component) and low-level cognitive areas (N170 component). Implications will be discussed in the context of recent theoretical models of top-down regulation (Bar, 2004; Niedenthal, Mermillod, Maringer, & Hess, 2010).

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