

Structural encoding and recognition of biological motion: Evidence from event-related potentials and source analysis.

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In the present study, we investigated how different processing stages involved in the perceptual analysis of biological motion (BM) are reflected by modulations in event-related potentials (ERP) in order to elucidate the time course and location of neural processing of BM. Data analysis was carried out using conventional averaging techniques as well as source localization with low resolution brain electromagnetic tomography (LORETA). ERPs were recorded in response to point-light displays of a walking person, an inverted walking person and displays of scrambled motion. Analysis yielded a pronounced negativity with a peak at 180 ms after stimulus onset which was more pronounced for upright walkers than for inverted walkers and scrambled motion. A later negative component between 230 and 360 ms after stimulus onset had a larger amplitude for upright and inverted walkers as compared to scrambled walkers. In the later component, negativity was more pronounced in the right hemisphere revealing asymmetries in BM perception. LORETA analysis yielded evidence for sources specific to BM within the right fusiform gyrus and the right superior temporal gyrus for the second component, whereas sources for BM in the early component were located in areas associated with attentional aspects of visual processing. The early component might reflect the pop-out effect of a moving dot pattern representing the highly familiar form of a human figure, whereas the later component might be associated with the specific analysis of motion patterns providing biologically relevant information.