Dance expertise modulates the visuomotor perception of body motion

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The modulation of visuomotor processing of various body movements by motor expertise due to dance practice was investigated in 12 professional contemporary dancers and 12 right-handed controls. 212 video pairs of dance actions lasting 3 seconds were shown to participants, while their event-related brain potentials (ERPs) were recorded. The second video of each pair might be either the repetition of the previous one, or a slight variation of it, along 3 main dimensions (time, space and body). The task consisted in responding to static images of a dance action by pressing a button. A repetition suppression (RS) effect elicited by a repetition of the same video was visible in both groups, whereas only in dancers it was found a significant modulation of brain responses to deviant stimuli indexing a strong effect of neural plasticity due to motor practice. SwLORETA source reconstruction, performed on the ERPs difference waves ‘‘different’’ minus ‘‘same’’ videos (450–550 ms) recorded in dancers, showed a widespread network of activations related to visuomotor perception including the limbic (BA 38, 23) and the fronto-parietal systems (BA 40, 3, 4, 9), plus areas devoted to biological motion (BA 20, 21, 41), face and body processing (BA 20, 37).