

## Neural fate of conscious and nonconscious perception of fearful body language in hemispatial neglect

Marco Tamietto, Franco Cauda, Katuscia Sacco, Federico Cossa, Sergio Duca, Giuliano Geminiani & Beatrice de Gelder

Department of Psychology, University of Torino and Cognitive and Affective Neuroscience Lab, Tilburg University

**Background:** Fearful body language modulates the spatial attention and enhances visual awareness in patients with hemispatial neglect. Here we investigated in a conjoint behavioral/fMRI study the neural correlates of this effect in one such patient. **Methods:** Neutral and fearful bodily expressions were presented either singly in the LVF or RVF, or bilaterally with displays containing a right-side neutral expression coupled to either a left-side neutral or fearful expression. **Results:** The neural correlates of nonconscious perception of fearful expressions were assessed by contrasting bilateral trials with left-side extinguished fearful bodies to unilateral trials where only a right-side neutral body was presented (and detected). This contrast revealed a neural activity in emotion-sensitive structures (amygdala and vmPFC), perceptive areas (FG, EBA, PCC), in the temporo-parietal junction implicated in automatic attentional shift, and in premotor areas. Conscious perception of fearful bodies in bilateral trials where a left-side fearful body was successfully detected was contrasted to the same trials where the left-side fearful body was extinguished. A significant contribution of sensory-motor areas, anterior insula and cerebellum was reported. **Discussion:** Our findings show considerable processing of neglected fearful bodies and suggest a key role of embodiment in the modulation of visual awareness for fearful bodily expressions.

## Readiness potentials in hemiplegic patients: Evidence from a single-case

Diana Torta<sup>1</sup>, Lorenzo Pia<sup>1,2</sup>, Alessia Folegatti<sup>1</sup>, Marco Neppi-Modona<sup>1,2</sup>, Sergio Vighetti<sup>3</sup>, Paola Perozzo<sup>3</sup>, Lorys Castelli<sup>1</sup>, Paolo Cerrato<sup>3</sup> & Anna Berti<sup>1,2</sup>

<sup>1</sup>Psychology Department, University of Turin

<sup>2</sup>Neuroscience Institute of Turin (NIT), University of Turin

<sup>3</sup>Neuroscience Department, Turin Medical School, University of Turin

**Background:** Readiness Potentials (RPs) represent the cortical contribution to the pre-motor planning of willed actions. We examined whether in hemiplegia is still possible to generate RPs despite the inability to move the contralesional limbs. **Methods:** We recorded RPs in a patient with complete left upper limb hemiplegia due to a right-hemisphere damage sparing motor and parietal areas. Two conditions were evaluated: 1) “motor execution”, in which the patient was asked to press a button with his right or left thumb (RT, LT) at his own pace; 2) “motor imagery” in which the self-paced movement was only to be mentally simulated. **Results:** RPs were preserved and the amplitude was not significantly different for RT (executed movement) and LT (attempted movement). RPs were also evident in the motor imagery task. **Discussion:** These results confirm and extend data showing that hemiplegic patients with damages sparing the motor system have a preserved ability to plan and intend actions. In a broader sense, these data suggest that the actual execution of voluntary action is not a necessary condition for generating a brain potential that has been related to our conscious experience of intending to act.