

**Canessa N, Alemanno F, Riva F, Zani A, Proverbio AM, Mannara N, Perani D, Cappa SF The neural bases of social intention understanding: The role of interaction goals. PLoS ONE, 2012; 7 (7).**

**Abstract**

Decoding others' intentions is a crucial aspect of social cognition. Neuroimaging studies suggest that inferring immediate goals engages the neural system for action understanding (i.e. mirror system), while the decoding of long-term intentions requires the system subserving the attribution of mental states (i.e. mentalizing). A controversial issue, stimulated by recent inconsistent results, concerns whether the two systems are concurrently vs. exclusively involved in intention understanding. This issue is particularly relevant in the case of social interactions, whose processing has been mostly, but not uncontroversially, associated with the mentalizing system. We tested the alternative hypothesis that the relative contribution of the two systems in intention understanding may also depend on the shared goal of interacting agents. To this purpose, 27 participants observed social interactions differing in their cooperative vs. affective shared goal during functional-Magnetic-Resonance-Imaging. The processing of both types of interactions activated the right temporo-parietal junction involved in mentalizing on action goals. Additionally, whole-brain and regions-of-interest analyses showed that the action understanding system (inferior prefrontal-parietal cortex) was more strongly activated by cooperative interactions, while the mentalizing-proper system (medial prefrontal cortex) was more strongly engaged by affective interactions. These differences were modulated by individual differences in empathizing. Both systems can thus be involved in understanding social intentions, with a relative weighting depending on the specific shared goal of the interaction.