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EMPOWERING FEEDBACK CONNECTIONS IN TEMPORO-OCCIPITAL NETWORK TO BOOST VISUAL PERCEPTION OF EMOTIONS

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Background: Social life crucially depends on the ability to efficiently process emotional signals from other people. Yet, the cortical neural mechanisms underlying emotion recognition are still poorly understood. In study 1, we tested the hypothesis that reentrant connections from temporal (Superior Temporal Sulcus; STS) to visual cortices (V1) may play a critical role in emotional expression discrimination.

Aims: The ambitious aim of the present project is to shed new lights on the way the human visual system makes humans aware of emotional stimuli and as, ultimate goal, by improving its functioning, enhance visual emotion discrimination abilities.

Method: Using a novel Transcranial Magnetic Stimulation protocol, we transiently enhanced synaptic efficiency in the reentrant connections from STS to V1 and we tested facial emotion discrimination performances and possible neurophysiological changes (i.e., modulations in the visual evoked potentials recorded by electroencephalography).

Results: We found that boosting the STS-V1 connectivity enhances emotion discrimination abilities as well as modulates the amplitude of early visual components involved in emotional face perception or in cognitive performances.

Conclusions: We provide novel causal evidence that STS-to-V1 back-projections, are malleable and functionally relevant to emotion recognition. These findings have implications for theoretical models of visual perception and awareness and for the rehabilitation of visual deficits.

Keywords: Emotion discrimination, Transcranial magnetic stimulation, Feedback connections, Visual evoked potentials, Electroencephalography.

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