
Extensive visual training in adulthood reduces an implicit neural marker of the face inversion effect

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Résumé

Face identity recognition (FIR) in humans is supported by specialized neural processes whose function is spectacularly impaired when simply turning a face upside-down: the Face Inversion Effect (FIE) (Yin, 1969). While the FIE appears to have a slow developmental course, little is known about the plasticity of the neural processes involved in this effect – and in FIR in general - at adulthood. Here we investigate whether extensive training (2 weeks, ~16 hours) in young human adults discriminating a large set of unfamiliar inverted faces can reduce an implicit neural marker of the FIE for a set of entirely novel faces. 28 adult observers were trained to individuate 30 inverted face identities presented under different depth-rotated views. Following training, we replicate previous behavioral reports of a significant reduction (56% relative accuracy rate) in the behavioral FIE as measured with a challenging four-alternative delayed-match-to-sample task for individual faces across depth-rotated views (Laguesse et al., 2012). Most importantly, using EEG together with a validated frequency tagging approach to isolate a neural index of FIR (Rossion et al., 2020), we observe the same substantial (56%) reduction in the neural FIE at the expected occipito-temporal channels. The reduction of the neural FIE correlates with the reduction of the behavioral FIE at the individual participant level. Overall, we provide novel evidence suggesting a substantial degree of plasticity in processes that are key for face identity recognition in the adult human brain.

Mots-Clés: face identify recognition, face inversion, neural plasticity, frequency tagging, EEG

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