

A novel virtual environment rt-fMRI neurofeedback paradigm

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Introduction

Real-time neurofeedback is a promising tool with potential for clinical applications. Different feedback modalities have been used to deliver feedback to participants (e.g., thermometer bar, numerical feedback, virtual environment). We created an immersive virtual environment (VE) for rt-fMRI neurofeedback with a focus on emotion regulation. Our aim is to assess the feasibility of this paradigm in a healthy control group and Arab refugees and migrants in a second step.

Methods

In a randomized double-blind, controlled design healthy participants (N=67) were assigned into one of three neurofeedback conditions: target region (left IFG, involved in emotion regulation), control region (left IPS, involved in numerical processing), or sham feedback. Participants were instructed to try and make the environment brighter or make more flowers bloom.

Results

First results demonstrate differences in activation patterns between groups involving the primary and secondary somatosensory cortex across runs. The somatosensory cortex is associated with emotion regulation which is in line with our theoretical framework and paradigm. Furthermore, our novel VE paradigm shows adequate acceptability across participants who perceived the VE as pleasant and the feedback as easy to interpret.

Conclusions

Our novel paradigm is a feasible method for NF training in terms of pleasantness and interpretability. Further planned analyses in this cohort as well as in traumatised individuals could offer insights into the correlates of emotion regulation and resilience.