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Introduction

- ❖ Self-related processing recruits a ventral network including the ventro-medial prefrontal cortex (vmPFC) and the left posterior superior temporal sulcus (pSTS)¹.
- ❖ Attentional control is associated with the dorsal frontal-parietal network.
- ❖ This study assessed the interaction between the self and attentional control networks² by testing a group of neuropsychological patients and assessing the relations between their lesions and any behavioural deficit on face and executive processing tasks (hypo- or hyper-self bias).

Methods

- ❖ 30 neuropsychological patients (28 stroke).
- ❖ Four tasks were included (Fig.1)
- ❖ Task1: face orientation – participants had to judge the orientation of faces (self faces, faces of a familiar other, or faces of a stranger).
- ❖ Task2: face categorisation – participants were required to group faces into familiar (their own faces and faces of a familiar other) or unfamiliar categories.
- ❖ Task3: cross task – the stimuli were identical to tasks 1 and 2, but participants had to judge which element of a cross (horizontal vs. vertical) was longer while ignoring faces in the background.
- ❖ Task4: rule funding and switching (BCoS battery) – participants were asked to predict the next move of a black dot (e.g., toward a red or a blue square?).
- ❖ Measures
 - ❖ Self-bias was indexed by the difference in performance between the self and familiar others; hyper-, normal or hypo- self bias was defined in contrast to the scores in 30 age and gender matched healthy controls.

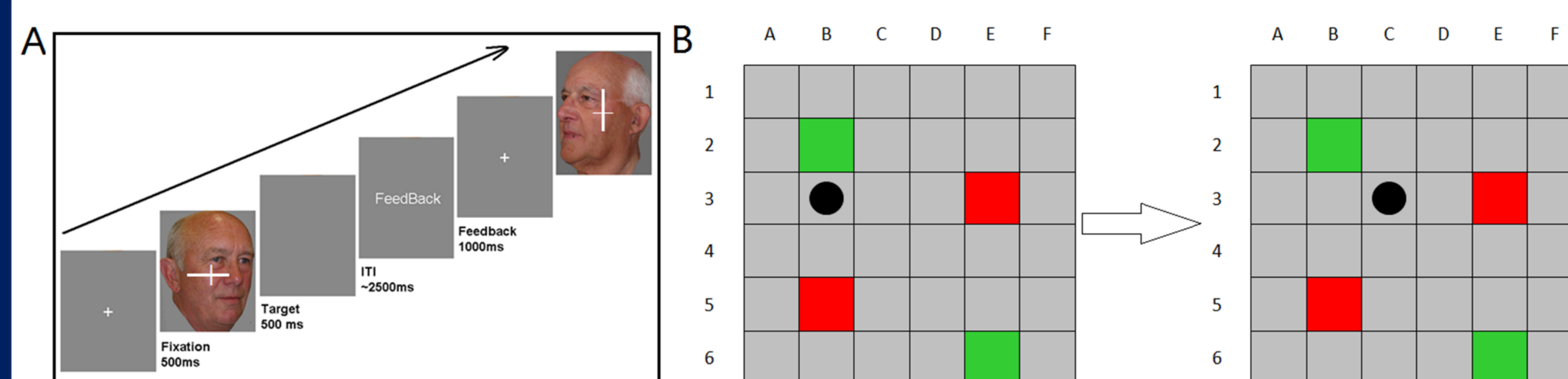
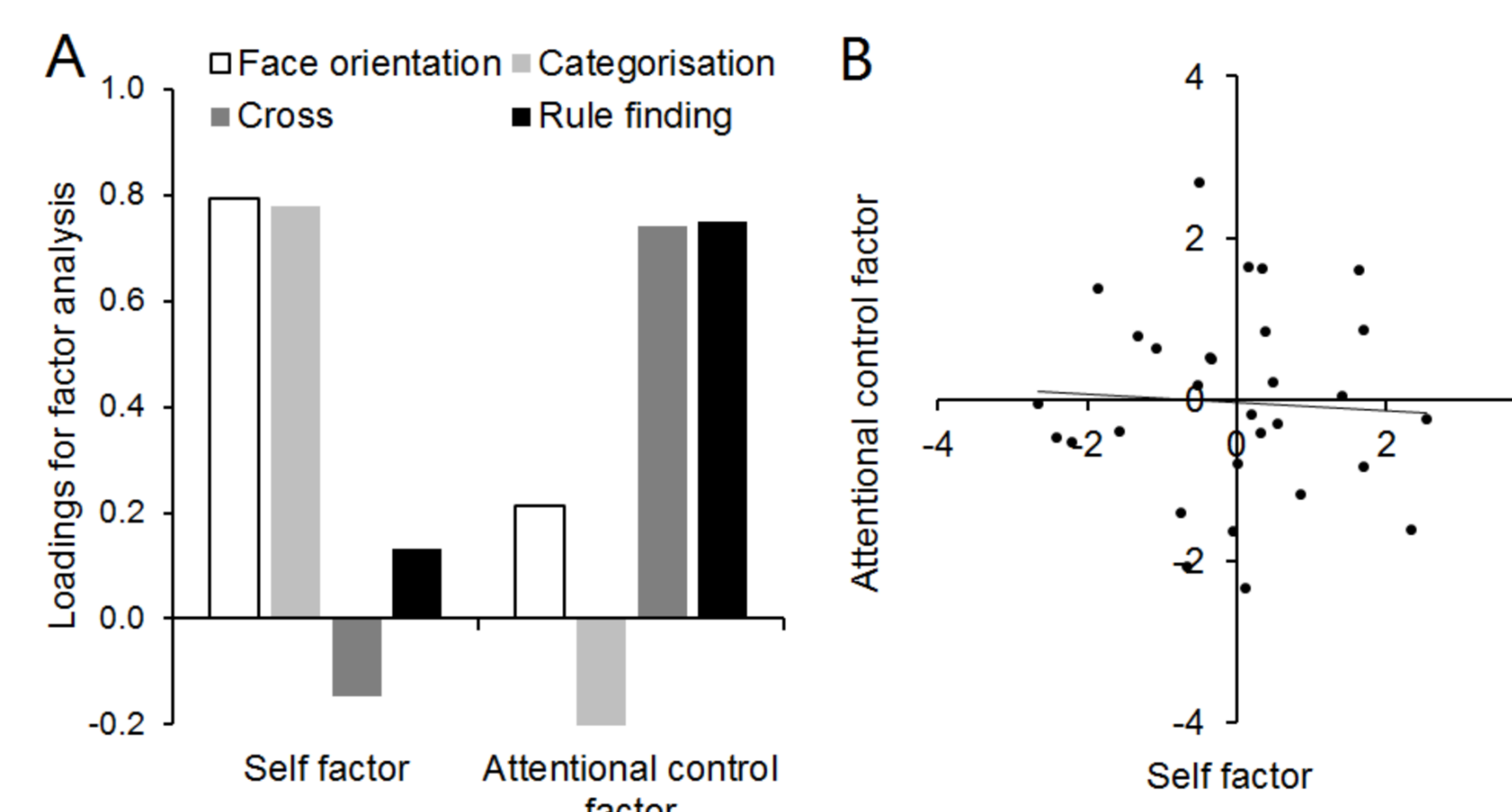


Fig. 1 A. the face orientation (task1), the face categorisation (task2), and the cross task (task 3). B. rule finding and switching (task 4).

Factor analysis across the four tasks

Fig. 2. A. two factors were formed. **Self factor:** tasks 1,2; **Attentional control factor:** tasks 3, 4. B. The two factors do not correlate.



Factors and white matter disconnections

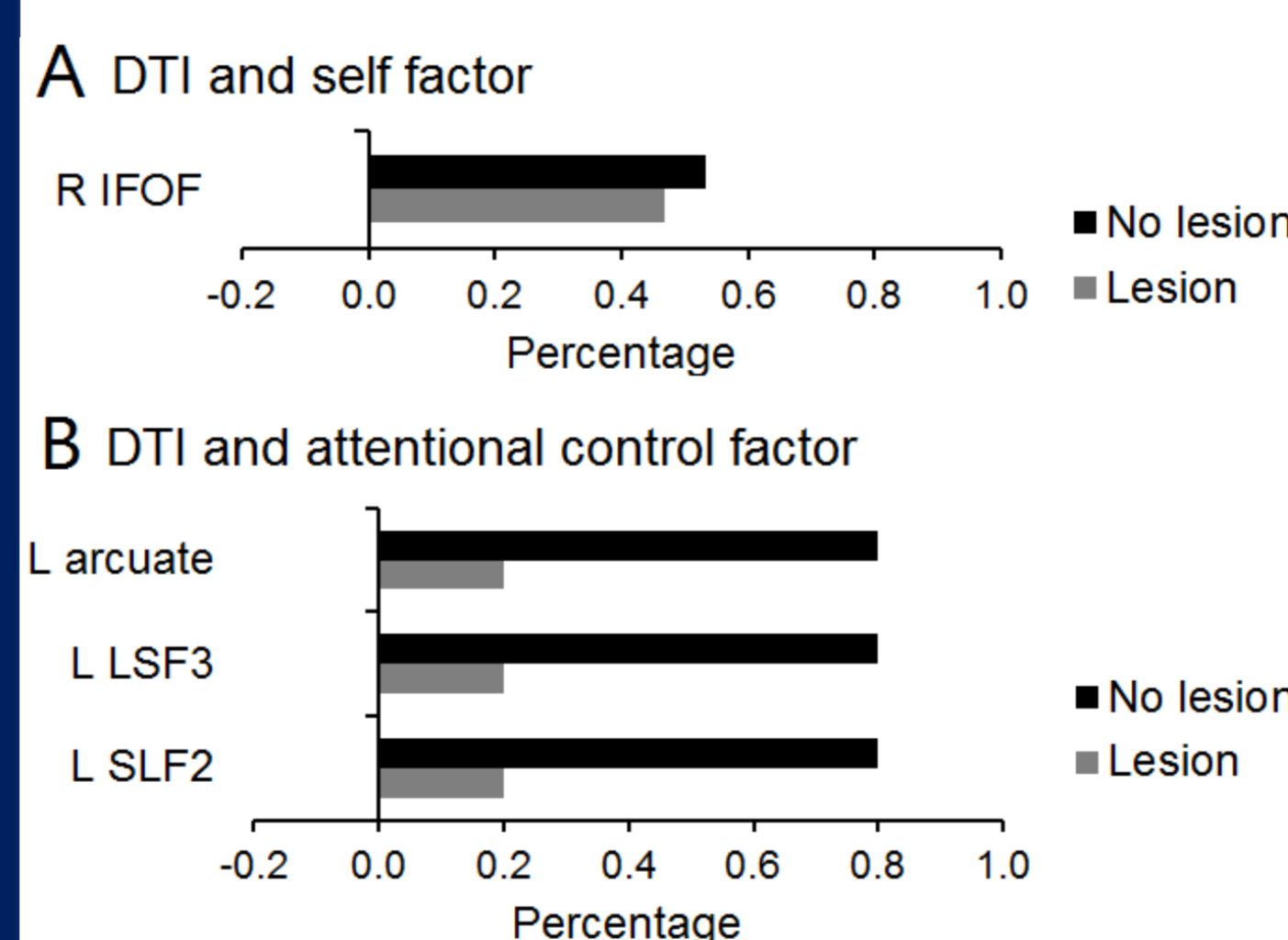
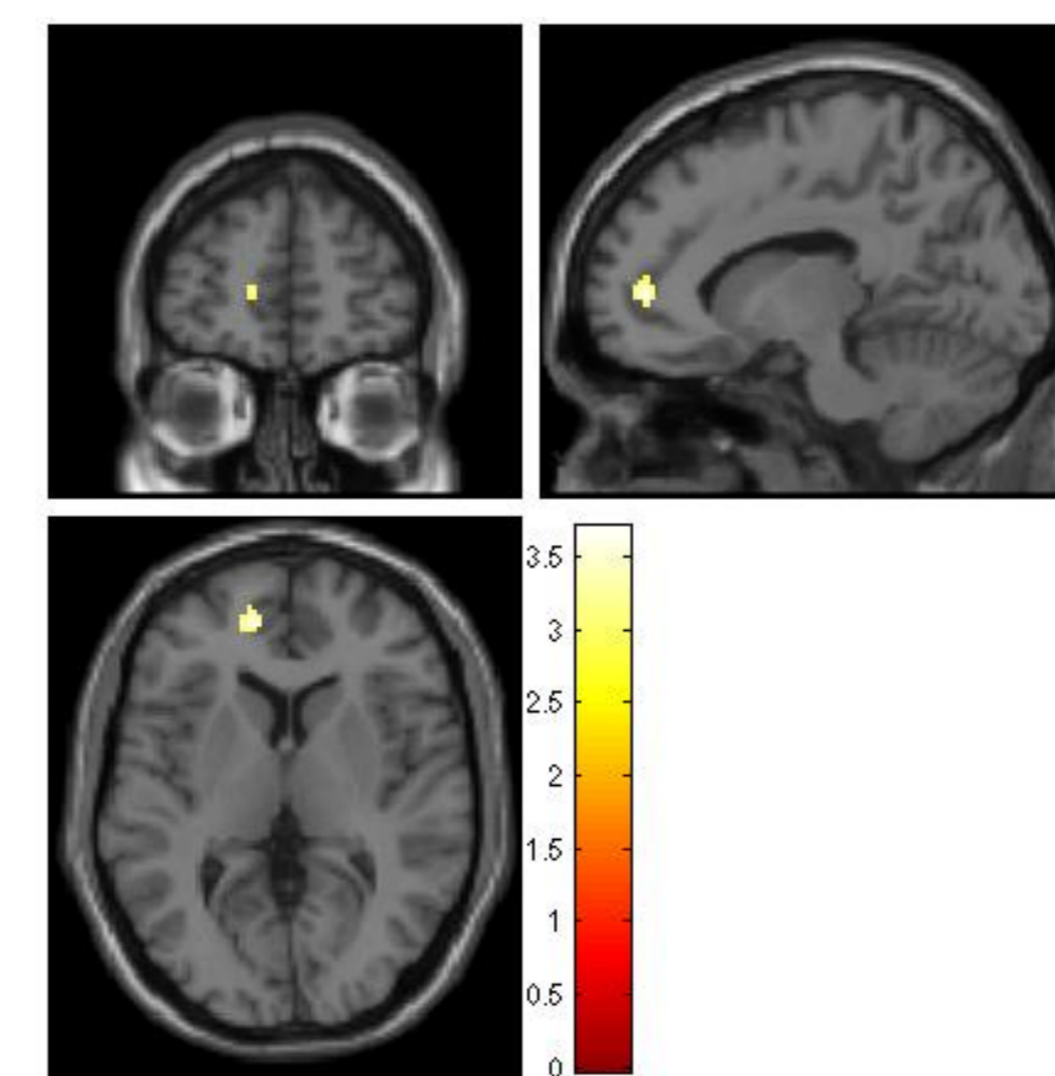


Fig. 3. A. Lesions in the right IFOF positively correlated with the self factor indicating the deficits of hypo-self bias. B. Lesions in the left arcuate, SLF2, and SLF3 positively correlated with the attentional control factor indicating hyper-self-bias and impaired rule finding.

Self factor and grey matter lesions

Fig. 4. Lesions in the ventro-medial prefrontal cortex were associated with the self factor (hypo-self bias).



Attentional control factor and grey matter lesions

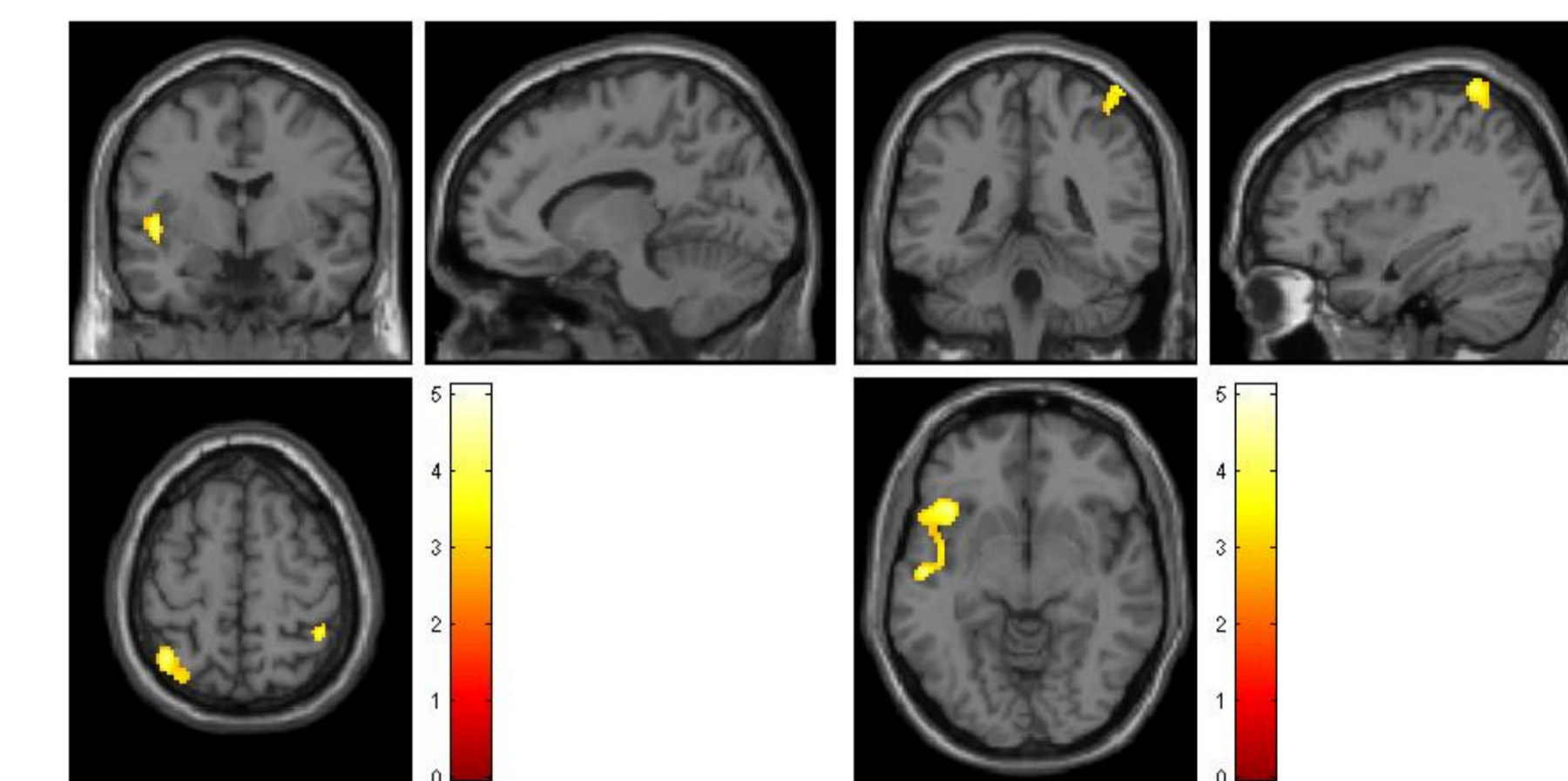


Fig. 5. Lesions in the bilateral dorsal parietal cortex and the left inferior frontal cortex were associated with the attentional control factor (hyper- self bias and deficits in rule finding).

Overlay between trajectories of white matter pathway and grey matter lesions

Fig. 6. The self factor: overlay between the vmPFC and right IFOF.

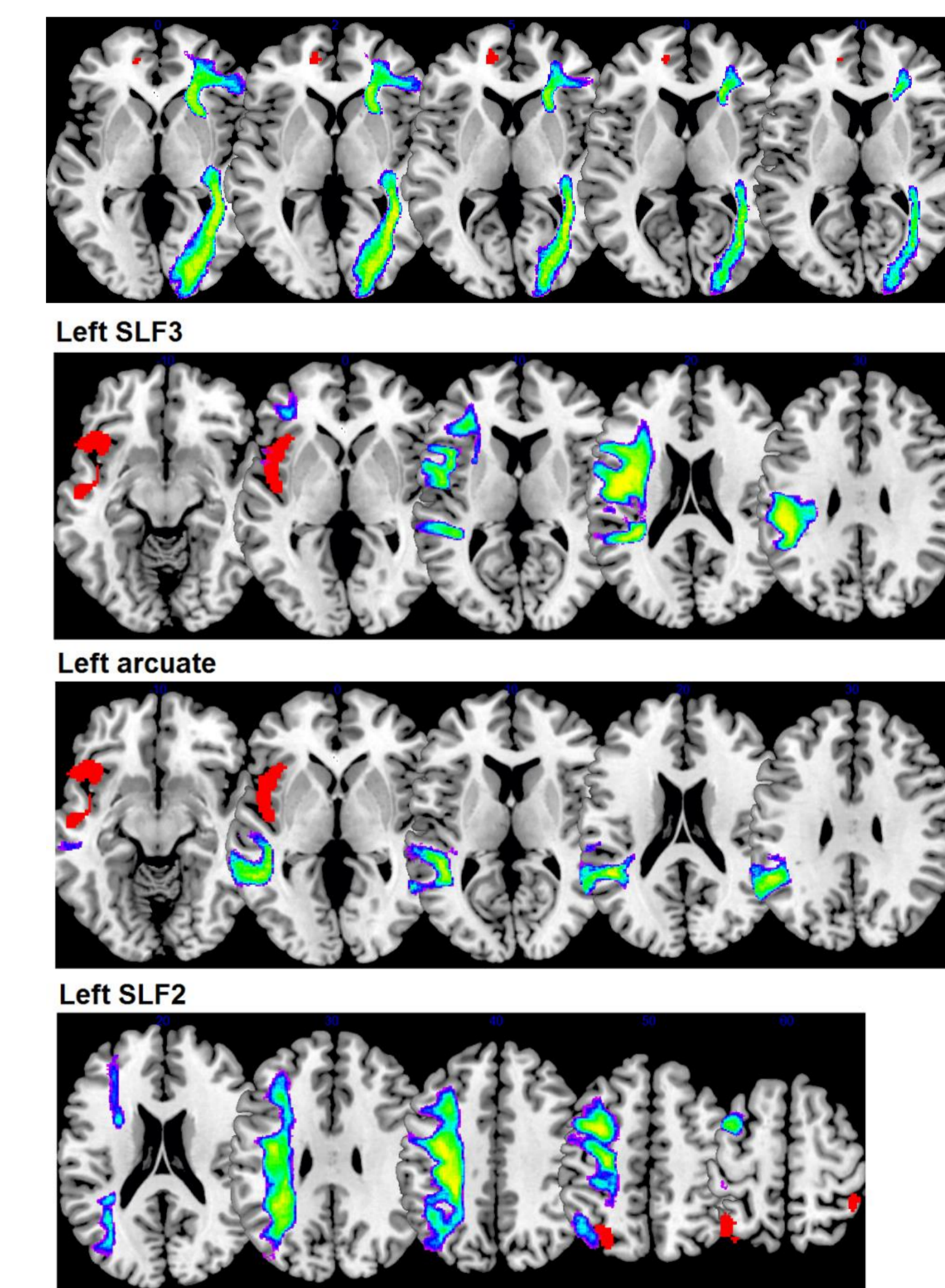


Fig. 7. The attentional control factor: overlay between the bilateral dorsal parietal cortex, the left inferior frontal cortex and the left SLF3, SLF2 and arcuate.

The ventral self network and dorsal frontal-parietal attentional control networks play opposite roles in self-bias.

References

1. Sui, J., Rotshtein, P., & Humphreys, G.W. (2013). PNAS.
2. Humphreys, G.W. & Sui, J. (2015). Cogn. Neurosci.