

Exploring the role of frontal regions in executive control and conscious perception

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Introduction

- The executive control network is involved in novel or complex situations [1].
- When executive control is exerted, conscious perception is impaired [2].
- This behavioral interaction is hypothesized to be sustained by shared neural resources in frontal regions.

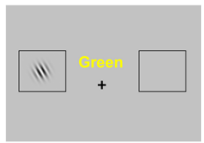
Partially shared neural resources for executive control and conscious perception are suggested, through:

- ❑ Functional connectivity of fronto-parietal regions (Fig. 1,2).
- ❑ Some frontal regions, such as the SMA (Fig.3).
- ❑ Microstructural properties of long-range white-matter tracts (such as the SLF; Fig. 2,3).

However, a less massive overlap is proposed compared to other attentional systems.

Methods

Dual task:
Stroop task +
detection of
near-threshold
Gabor stimulus.



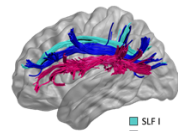
Exp 1 [3]: fMRI



Exp 2 [4]:
Online TMS
over the SMA



DWI tractography of
the SLF



[1] Petersen & Posner, 2012; [2] Colás, Triviño & Chica, 2017; [3] Martín-Signes, Paz-Alonso & Chica, 2018. [4] Martín-Signes, Cano-Melle & Chica, in review.

Results

Fig. 2

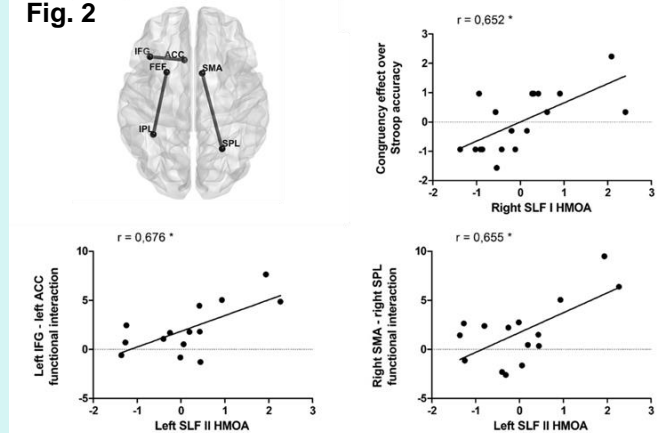


Fig. 3

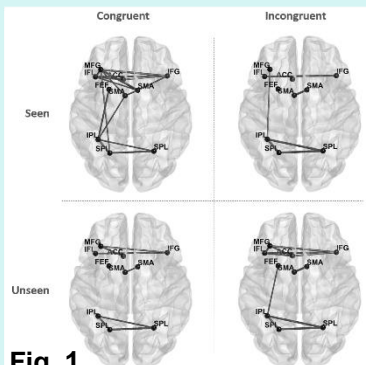
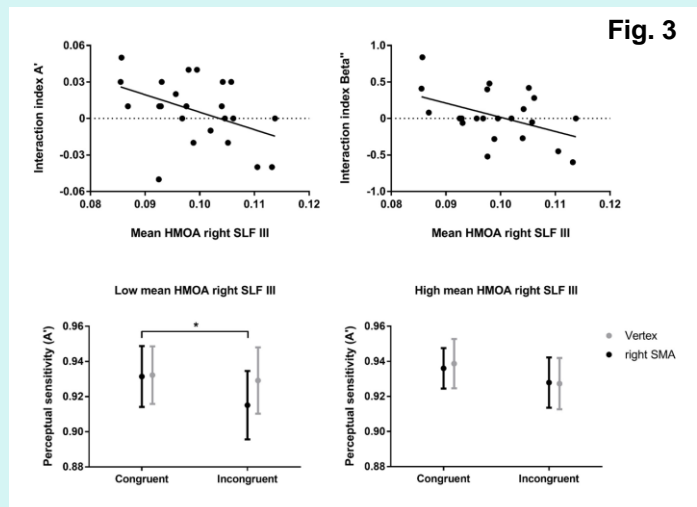


Fig. 1