**Computational brain dynamics in prosopagnosia**


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**Background**

**Prospagnosia**

From a neuroanatomical & functional account to a computational description of brain function

**Method**

Recording a large condition-rich high-density EEG data set

- 3.3 trials per individual (60x trials total) with faces, objects, scenes, animals, plants...
- one-back task
- face-specific behavioural impairment

BioSemi 128 electrodes, band-passed 0.1-50 Hz

- prosopagnosic patient PS
  - Fem, 69yo, right-handed
- aged-matched controls
  - 9 Fem, Mage=22.9, right-handed
  - Neurotypical controls
  - 3 Fem, Mage=67.5, right-handed
- Aged-matched controls
  - 6 Fem, Mage=22.3, right-handed

Applying RSA to EEG time courses to reveal brain dynamics

**Results**

**Impaired representational distance between face-identities?**

- PS vs. controls: 0.115 ± 0.080 vs. 0.065 ± 0.072
- PS vs. controls: t(17) = 7.15, p < .001
- PS vs. controls: t(17) = -2.76, vs. typicals: p > .40

**What are the neurocomputational aspects affected in prosopagnosia?**

**Discussion**

Prospagnosia affects a cascade of different neural computations, from visual & face-identity to even higher-level semantic processing

Visual and semantic brain computations seem to be involved from prosopagnosia to ‘super-recognition’ (see Faghel-Soubeyrand et al. 2022; bioXiv)

Differences in time courses with super-recognisers likely emerge from extensive lesions of PS at the beginning of the face processing stream (right OFA, e.g. Pitcher et al., 2007).

RSA proves to be a powerful tool to define neural computations of individuals with substantial structural alterations

**References**


Schiltz & Rossion, 2007

Faghel-Soubeyrand et al., 2022; biorXiv