The neural basis of intelligence in fine-grained cortical topographies

Summary

1. Problem

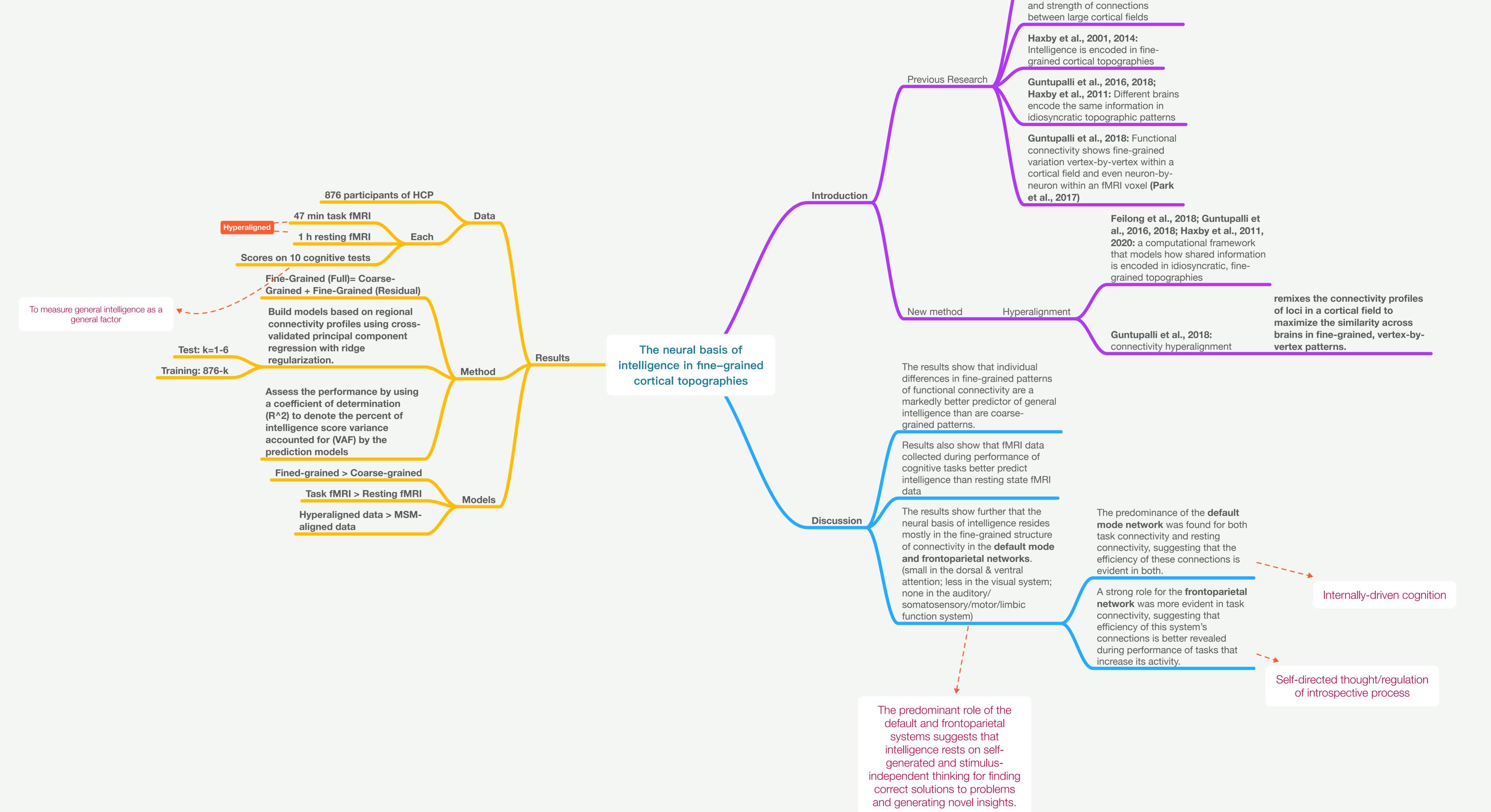
Previous research on the neural basis of intelligence has focused on coarse-grained features of brain anatomy and function and overlooked fine-grained architecture in that existing models could not resolve idiosyncratic topographies, that is to say, no principled method could investigate how the information embedded in these topographies differs across individuals.

2. Solution in this article

This article uses hyperalignment to model the fine-grained architectural differences by resolving idiosyncratic interindividual variation of fine-grained topographies of functional connectivity. This model has been proven to improve the predictions of general intelligence, especially in the cortical systems associated with self-generated thought.

3. Future direction

The bases for the organization of its fine-grained topographies and the transformations of representational geometries between default regions are unknow, but the keys to understanding it may reside in the information processing embedded in these topographies.



Cox et al., 2019; Schmitt et al., 2019; Kong et al., 2019: The size and shape of the brain and its parts

Dubois et al., 2018; Finn et al.,

2015; Luders et al., 2007: the size