Social Brain Dynamics:

Social domain-specific neural network re-configuration enables understanding of others' thoughts and feelings

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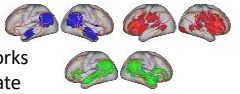
Introduction

Previous research identified a hierarchical three-cluster network structure of social affect and cognition (Schurz et al., in press, PsychBull)



- „Classical" empathy and Theory of Mind network, an intermediate network containing nodes from both networks

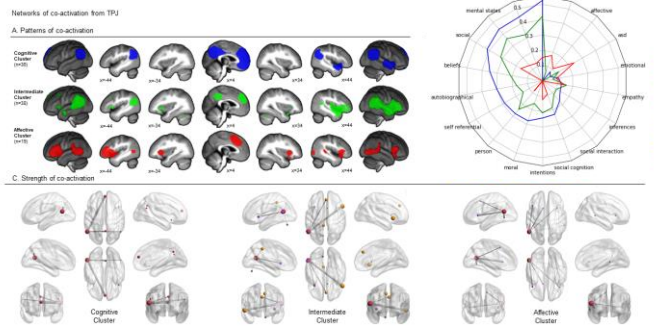
We follow up on these findings and extend them to investigate

- *How do empathy and Theory of Mind networks interact within the same task?*
- *Which task characteristics probe cross-network interaction?*

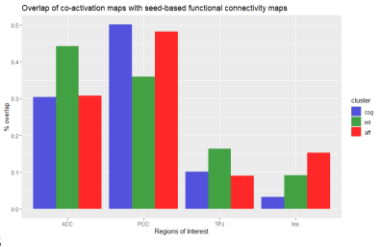
Methods

- Meta-Analytic Connectivity Modeling (MACM) on a sample of 140 studies from the social affect and cognition realm (Schurz et al., 2020, PsychBull) that show activation at
  - ACC, PCC, TPJ, anterior Insula/IFG
- Signed Differential Mapping (SDM 5.15, Radua et al., 2012, Eur Psychiatry)
  - p > 0.005 (voxel level), cluster threshold: 10 voxels
  - Linear contrasts using SDM's linear model function
- Comparison of co-activation maps with other meta-analyses (Neurosynth Decoding), resting-state functional connectivity maps

Results



Discussion



- Simultaneous cross-network interaction of Empathy and Theory of Mind networks in naturalistic social cognition
- Flexible network re-configuration for Insula and TPJ nodes
  - Dynamic social cognition network hubs
- Network integration as a means of integrating complex/ unique behaviors across behaviors (Shine & Poldrack, 2018, NeuroImage)
  → Potentially relevant mechanism in complex, naturalistic social cognition