

Neural Typicality During Naturalistic 7T fMRI Tracks Cognitive Performance in Multiple Sclerosis



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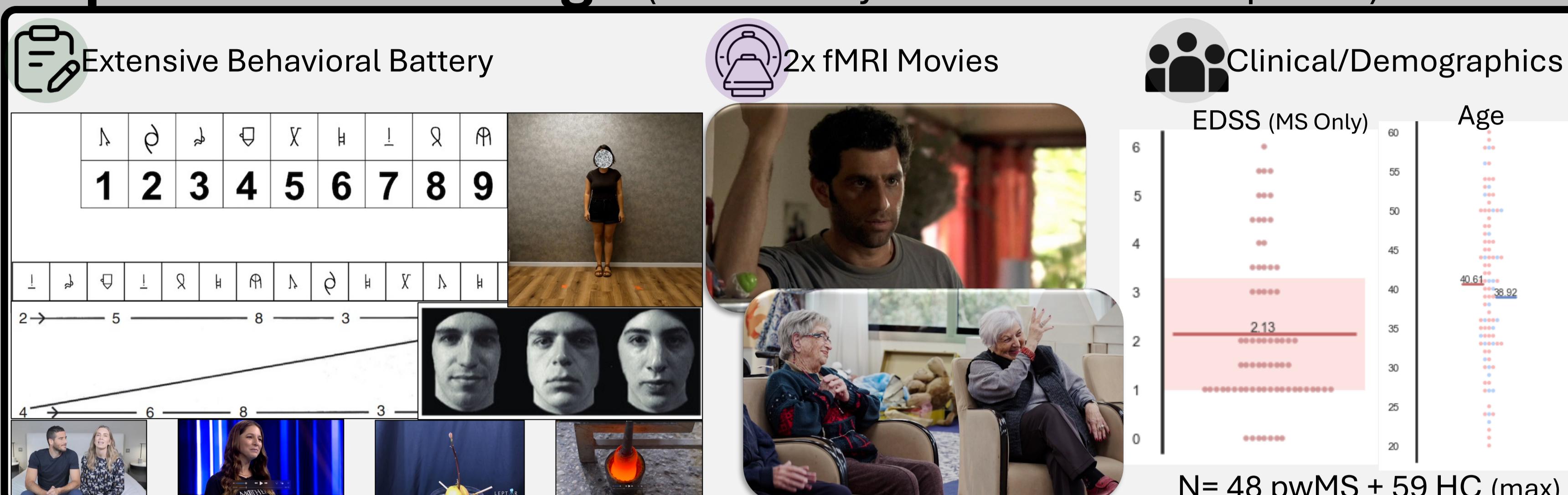
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Key Takeaways

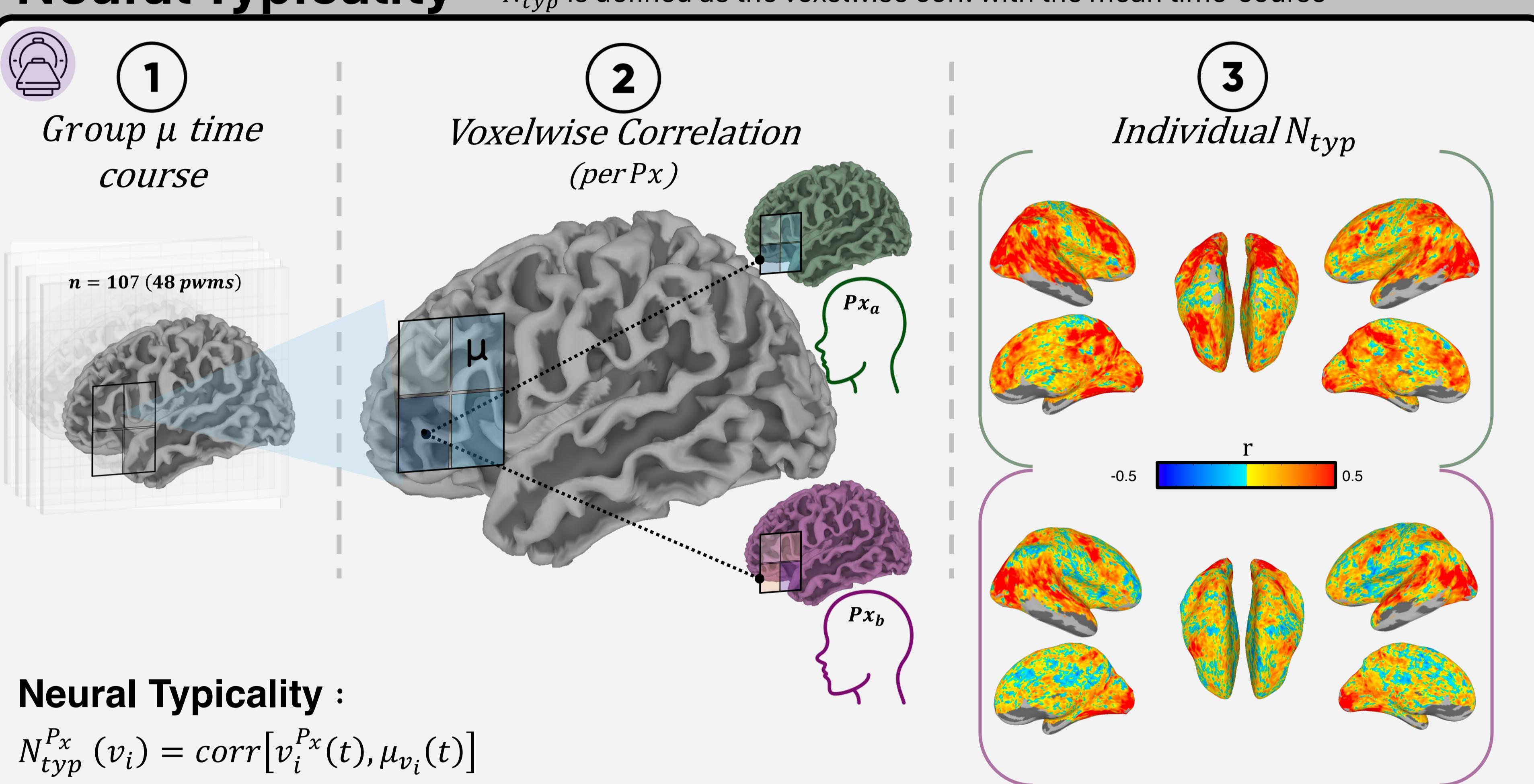
- Neural Typicality (N_{typ}) during movie watching can serve as a brain based-marker predictive of cognitive performance
- Multiple Sclerosis (MS) is associated with reduced N_{typ} , with patients showing more atypical neural responses than healthy controls
- Regions with MS-related disruption in N_{typ} overlap with those linked to behavior
- Same regions, different dynamics: MS alters how the brain processes cognition

Experimental Design (Two full days of data collection per P_x)



Neural Typicality :

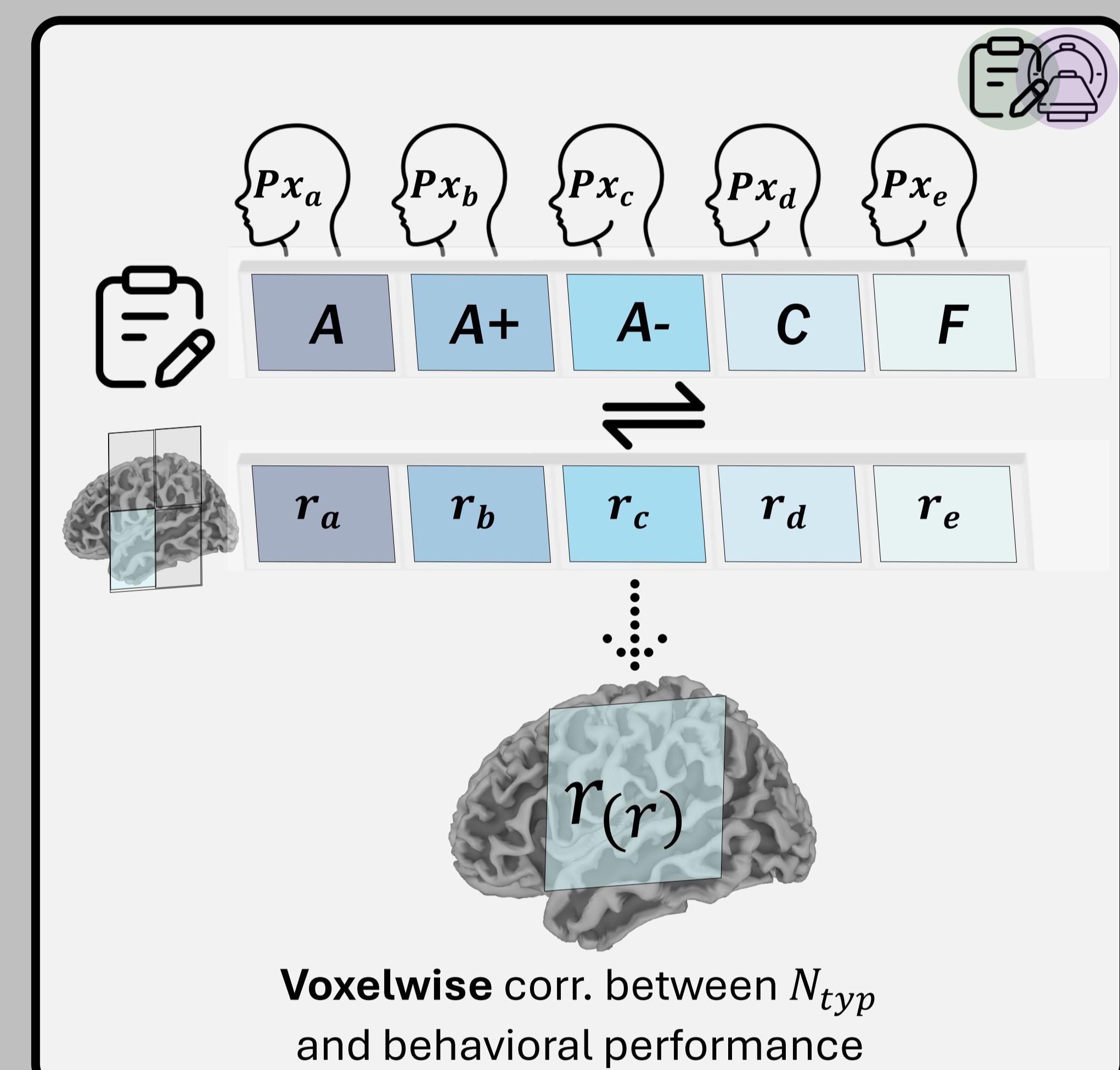
For a given P_x and movie:
 N_{typ} is defined as the voxelwise corr. with the mean time-course



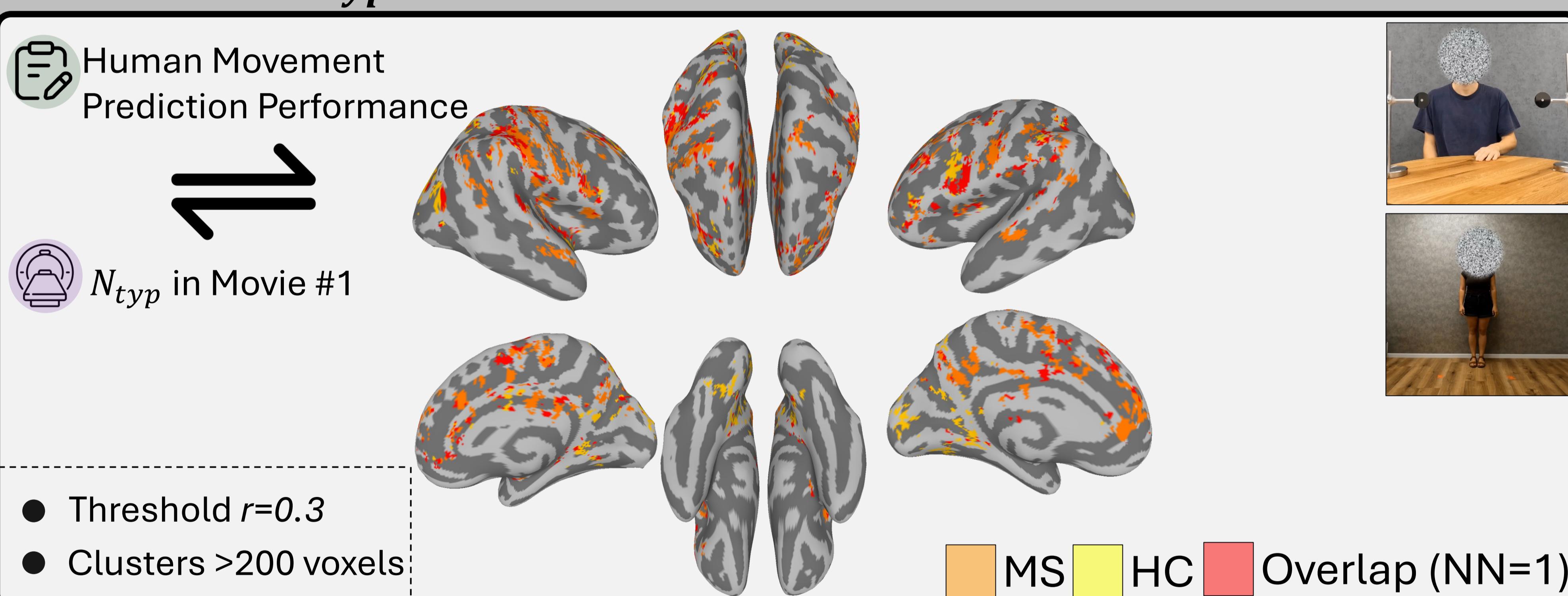
Neural Typicality :

$$N_{typ}^{P_x}(v_i) = \text{corr}[v_i^{P_x}(t), \mu_{v_i}(t)]$$

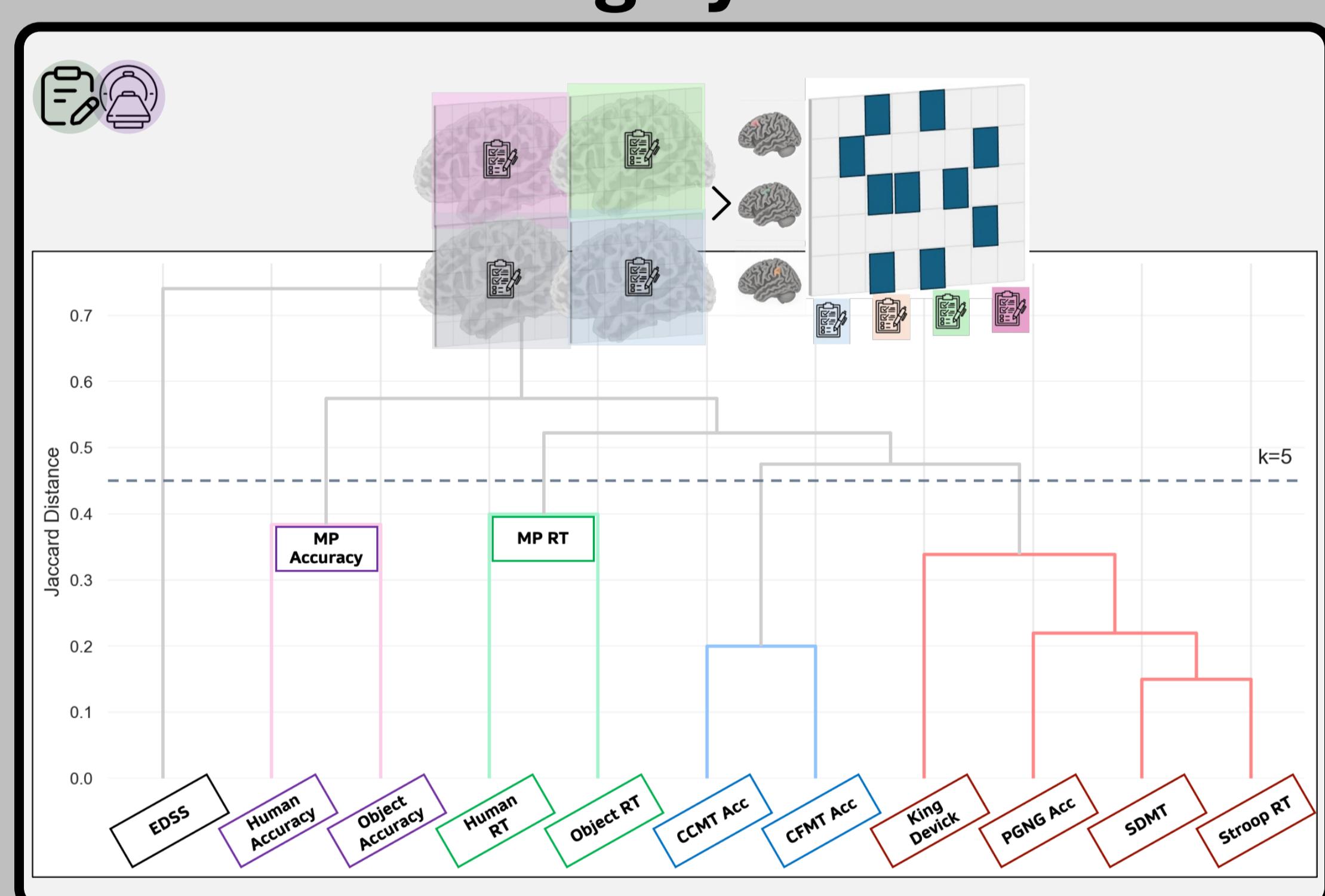
Brain to Behavior



Voxelwise N_{typ} to Behavior Correlation



Task Clustering by Neural Profiles



N_{typ} Correlates to Task Performance

