

## Introduction

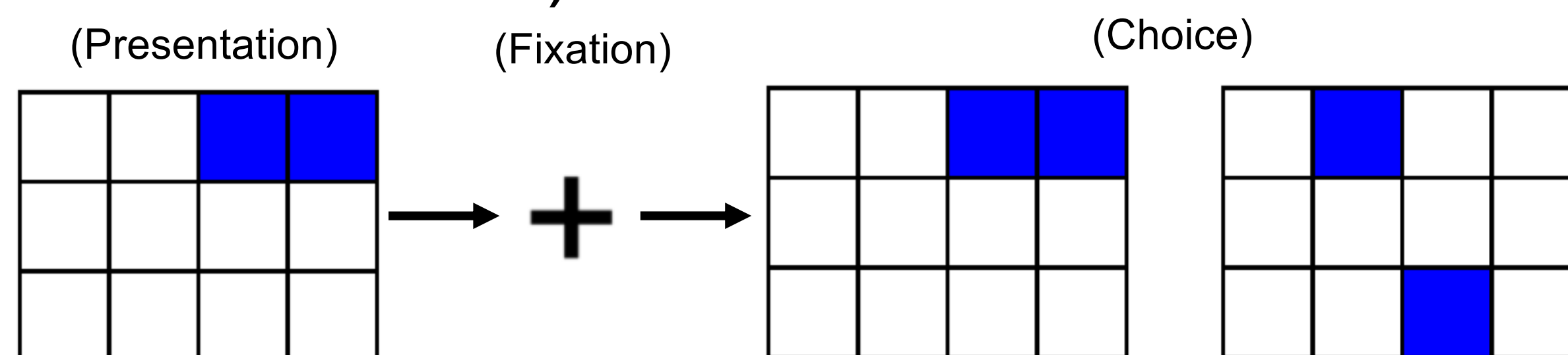
- The domain-general (a.k.a. Multiple Demand (MD)) network is made up of frontal and parietal regions and assists in cognitive tasks requiring increased executive processing<sup>1</sup>
- The MD network is one of last brain networks to develop<sup>2</sup>
- Maturation of this network (activation and connectivity) may lead to increases in competency on difficult cognitive tasks

## Research questions

- Does the MD network respond similarly to increased cognitive demand in adults and kids?
- How does resting state connectivity of domain-general cortex compare between groups?

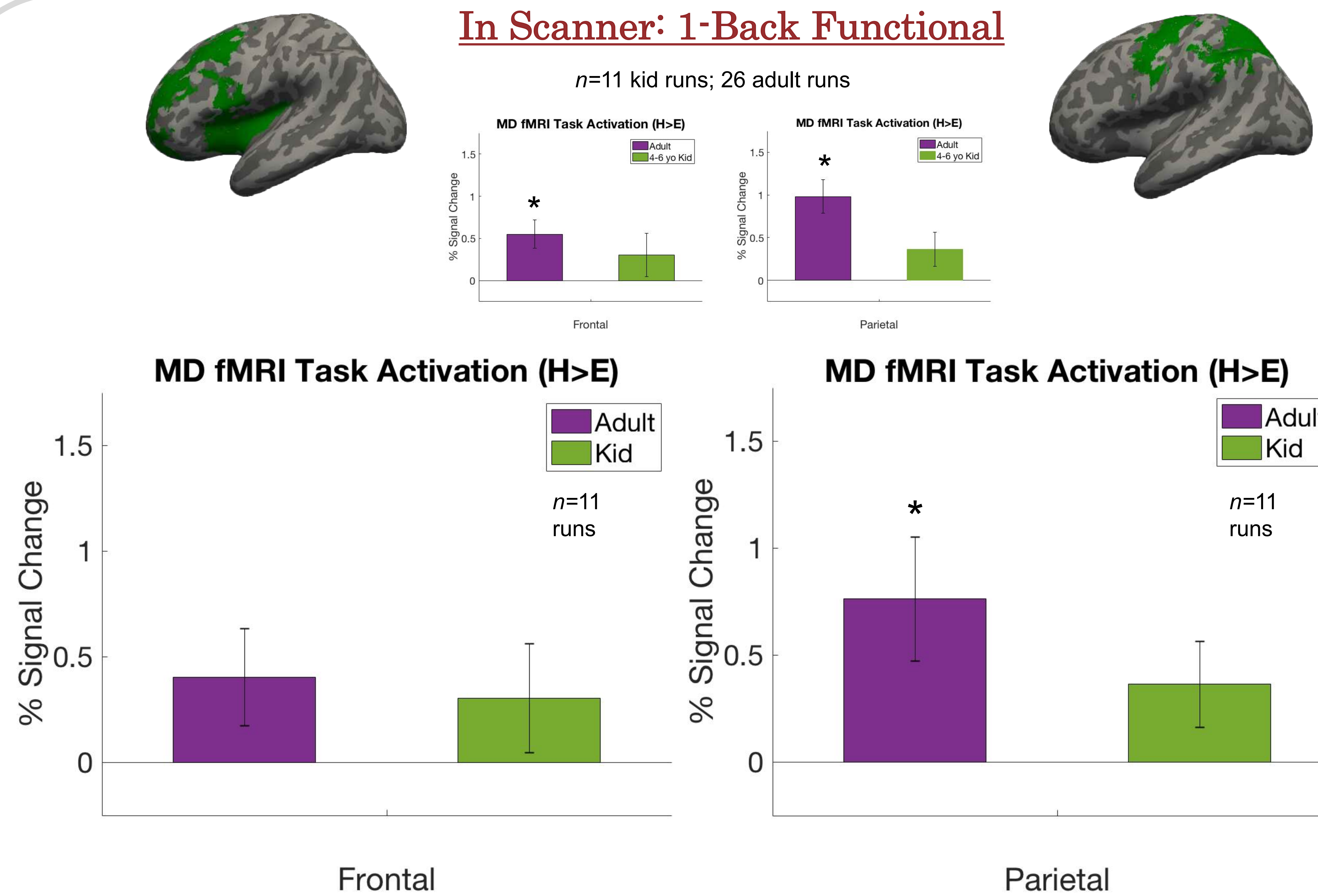
## Methods

- fMRI Task:** *n*-back working memory task with Easy and Hard conditions (Adults (Age: 18-30) *n*=11 runs; Kids (Age: 4-6) *n*=11 runs (2 runs per kid/adult\*))



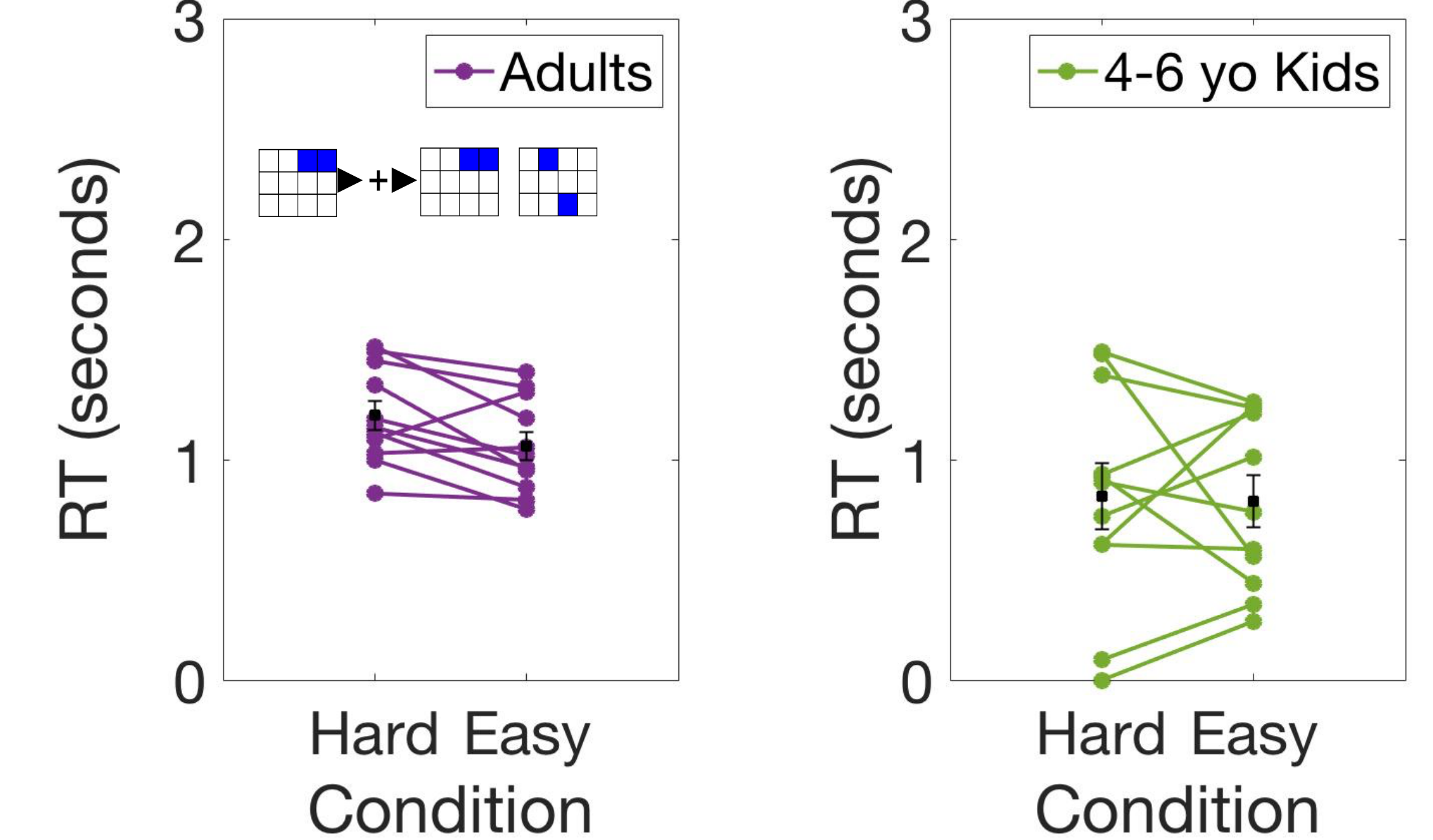
- Resting-state:** Comparison of intra- and inter-network connectivity (Adults *n*=6; Kids *n*=6); literature suggests greater intra- vs internetwork connectivity in adults<sup>3</sup>
- Internetwork connectivity computed between MD regions and adjacent language regions (localized using English sentences vs non-words<sup>1</sup>)

## In Scanner: 1-Back Functional

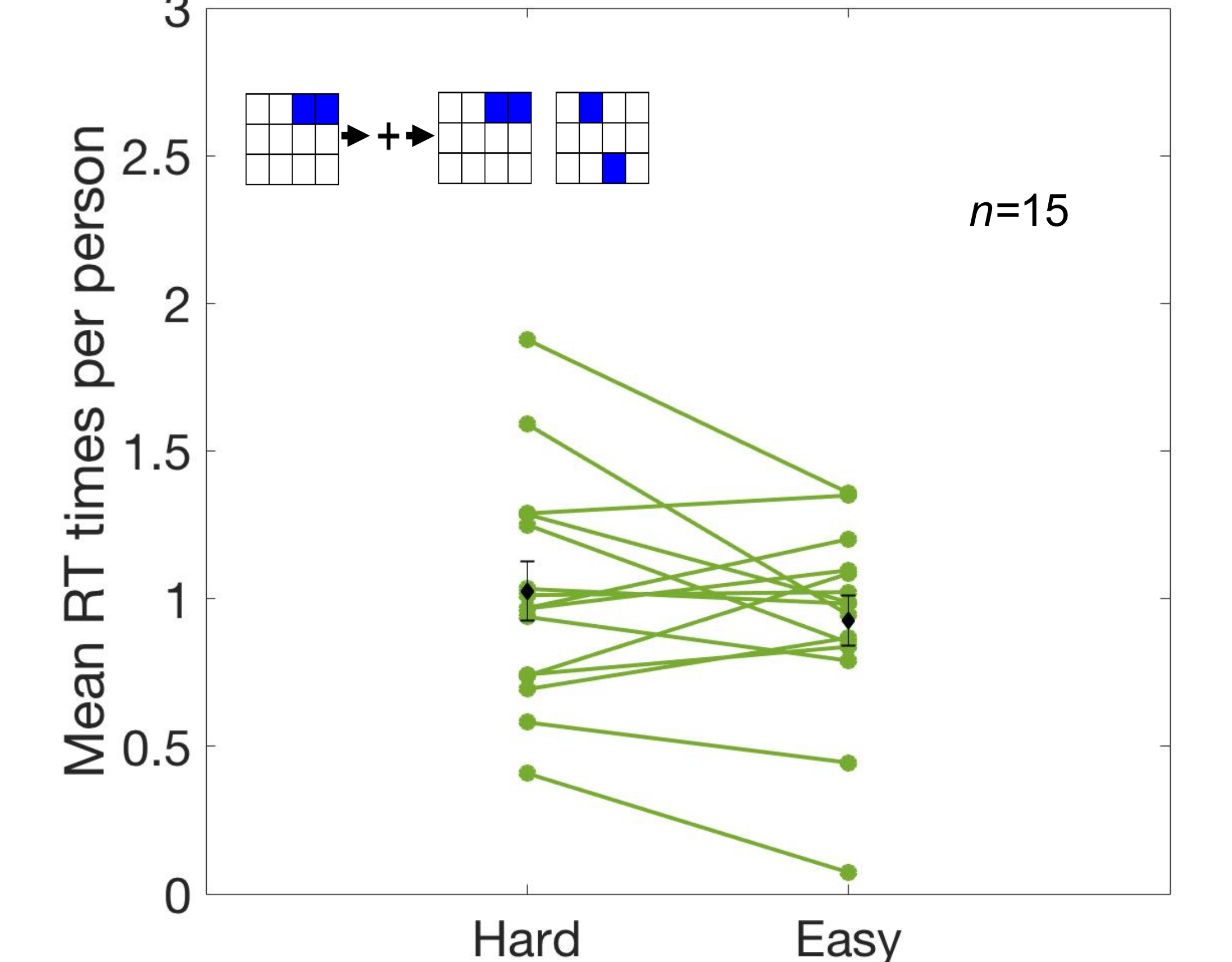


## 1&2-Back Behavioral

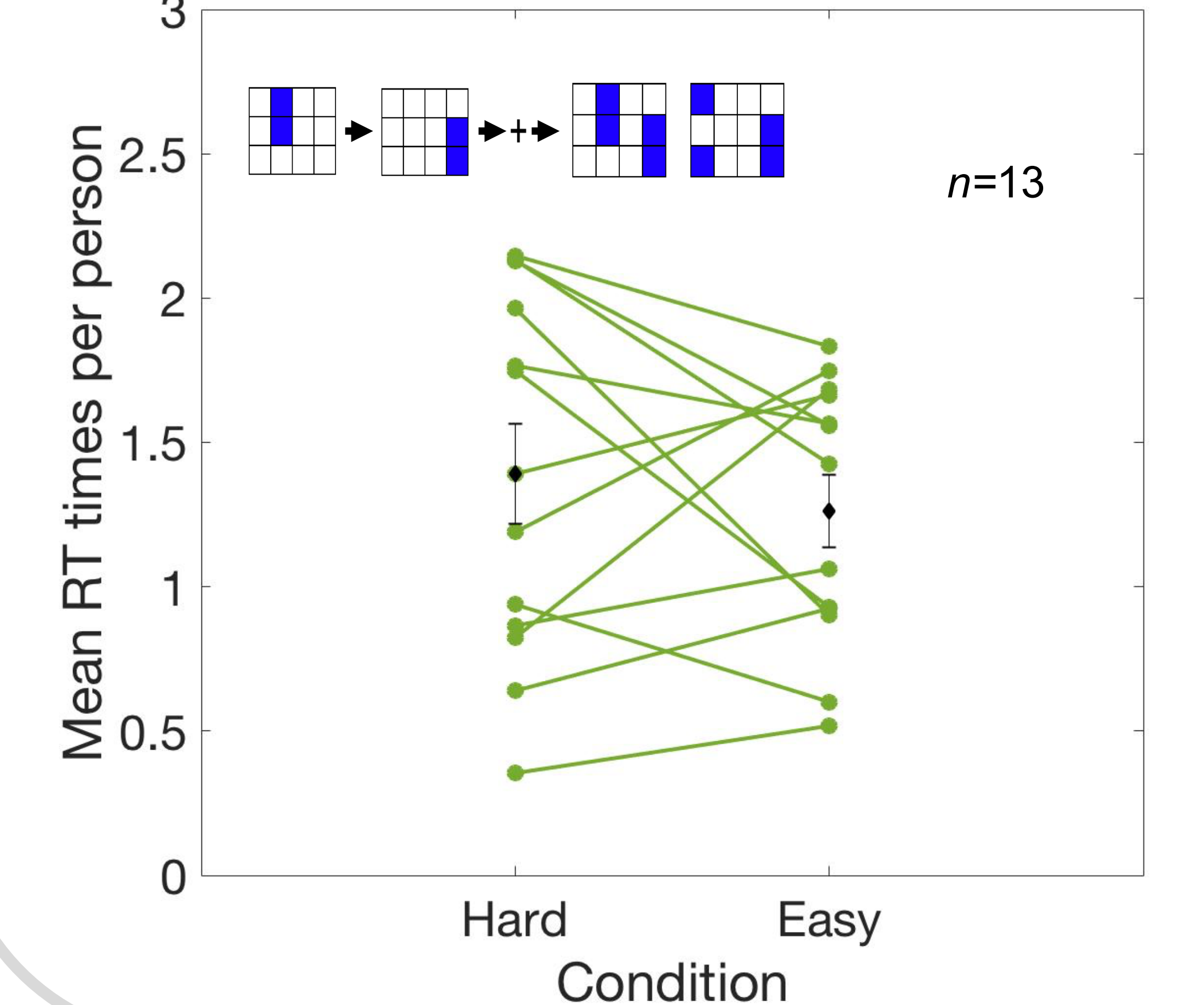
### In Scanner: 1-Back Correct Trials



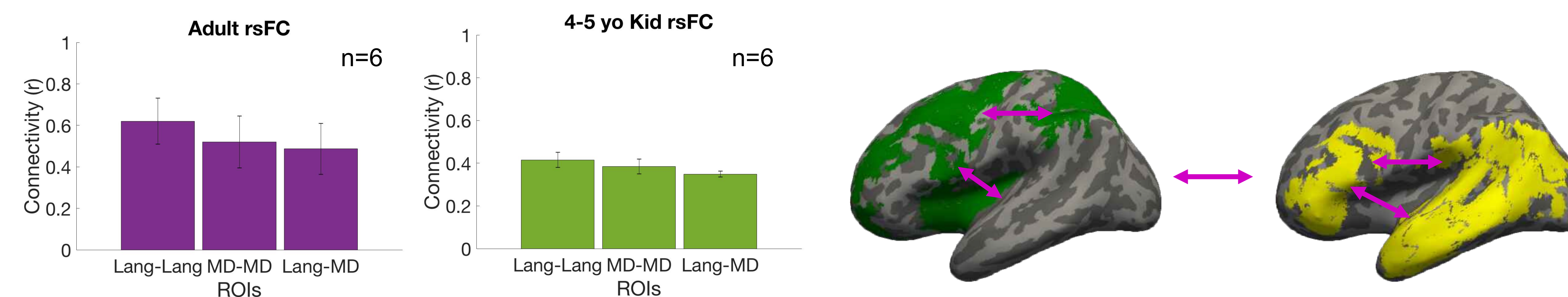
### Out of Scanner: 1-Back Correct Trials



### Out of Scanner: 2-Back Correct Trials



## Resting State Connectivity



## Conclusions

Preliminary results show immature neural activity and connectivity in domain-general cortex at age 5, suggesting putative neural mechanisms underlying the prolonged development of attention and cognitive control in kids

## References

- [1] Fedorenko et al., *Proceedings of the National Academy of Sciences* (2013); [2] Gao et al., *Cerebral Cortex* (2015); [3] Blank, Kanwisher & Fedorenko, *Journal of Neurophysiology* (2014)