

MAPPING DISTRIBUTED AND SELECTIVE ATTENTION ONTO THE BRAIN

Galit Agmon^{1*}, Paz Har-Shai^{1*}, Michal Ben-Shachar^{1,2}, Elana Zion Golumbic¹

Gonda Multidisciplinary Brain Research Center¹, Department of English Literature and Linguistics²

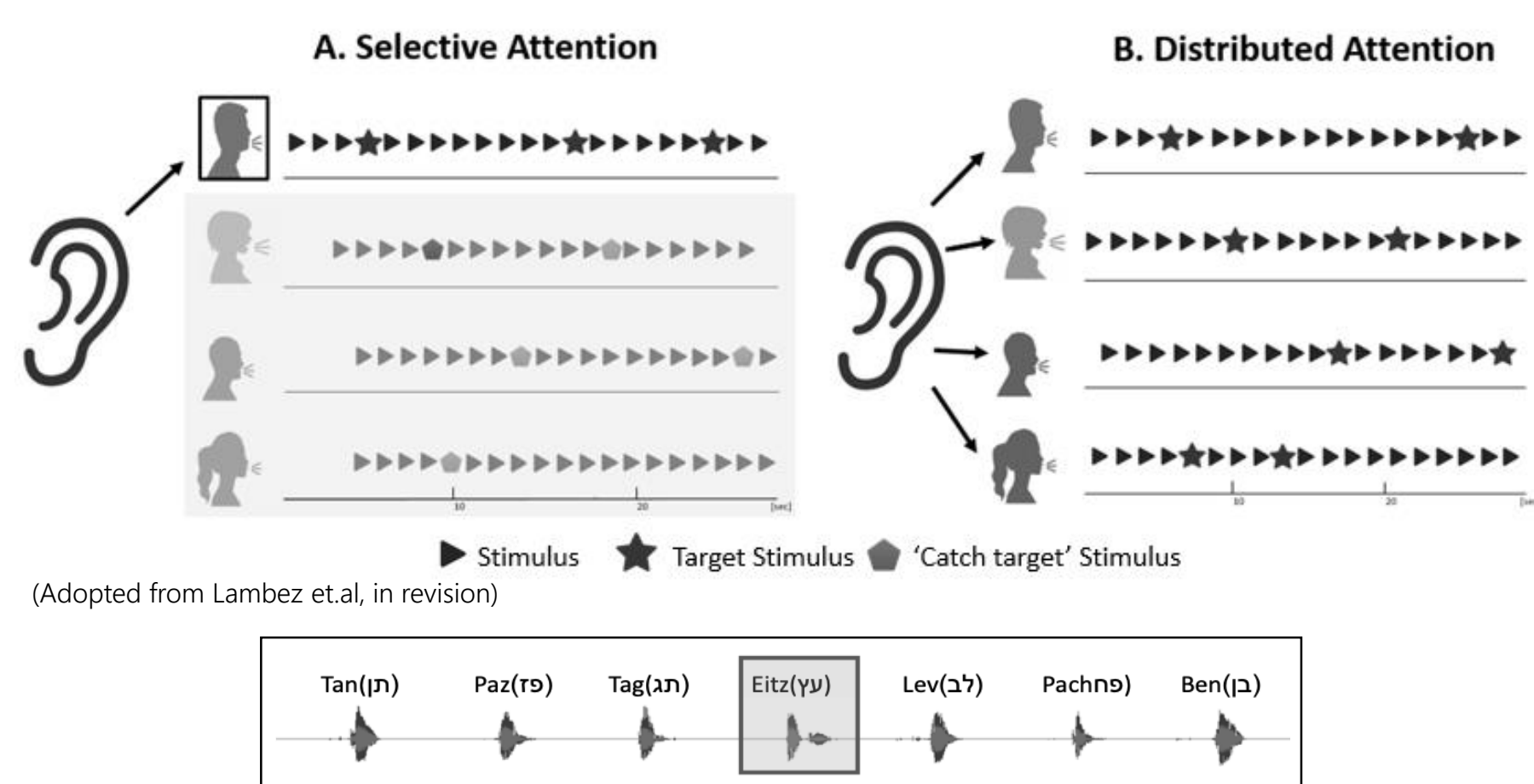
Bar-Ilan University, Ramat-Gan, Israel

* Equal contribution

INTRODUCTION

Focusing on one speaker in a noisy environment is a challenging task. So is distributing attention among multiple speakers. Do these two attention strategies harness different cognitive mechanisms? Can we identify the neural networks that are associated with each type of attention? This study explores these questions using fMRI, in a behavioral paradigm that directly targets auditory attention to speech.

EXPERIMENTAL DESIGN

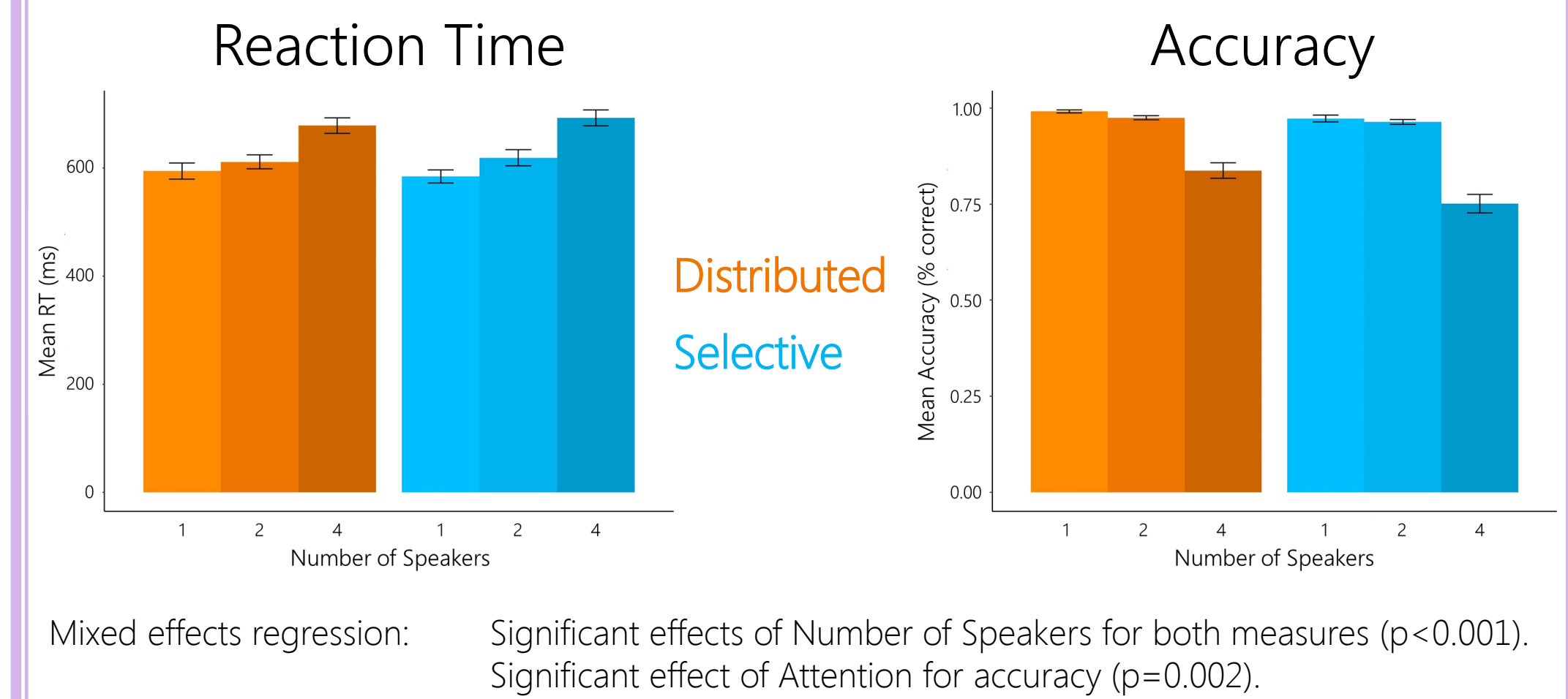


	Distributed Attention	Selective Attention
4 speakers	4 blocks per run	4 blocks per run
2 speakers		
1 speaker	2 blocks per run	2 blocks per run

×3 runs ×3 runs

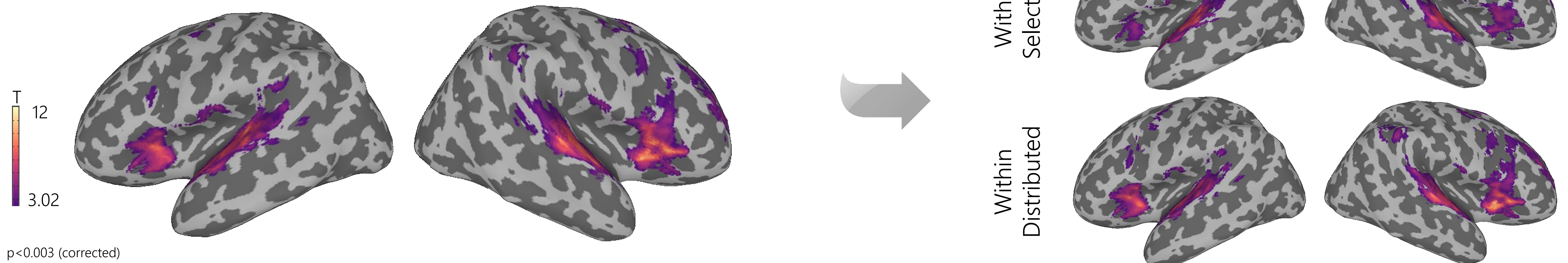
N = 35 | Block duration = 12s | TR = 2s | Voxel size = 2³ mm³

BEHAVIORAL RESULTS

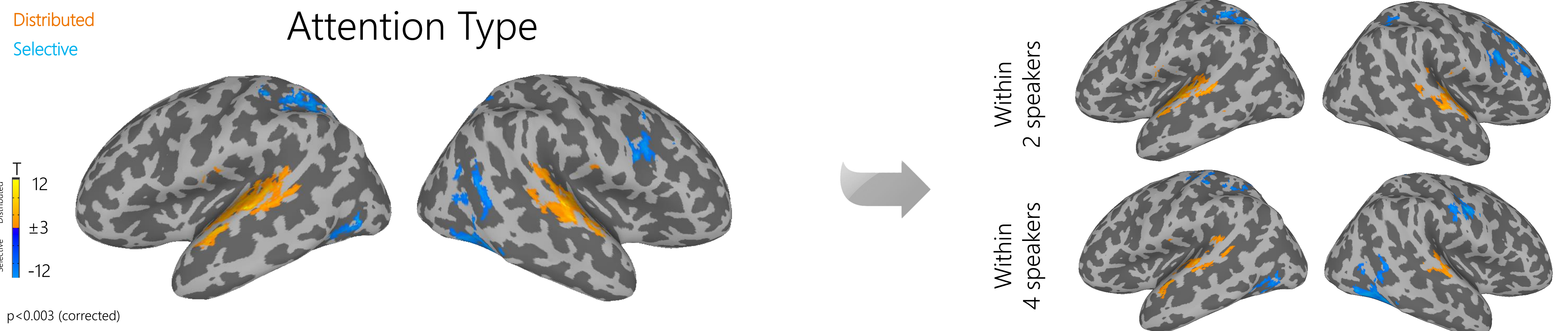


WHOLE BRAIN ANALYSIS (2x2 ANOVA)

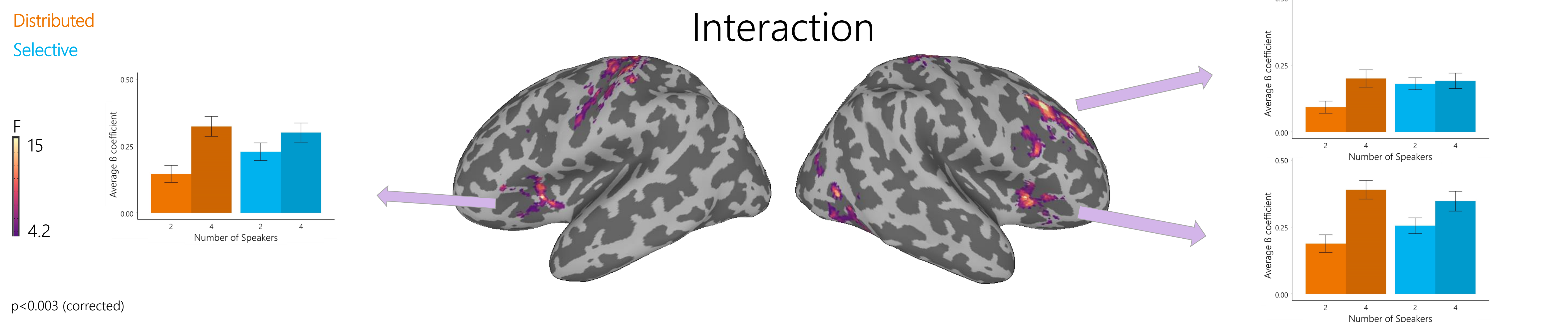
Number of Speakers (4spk > 2spk)



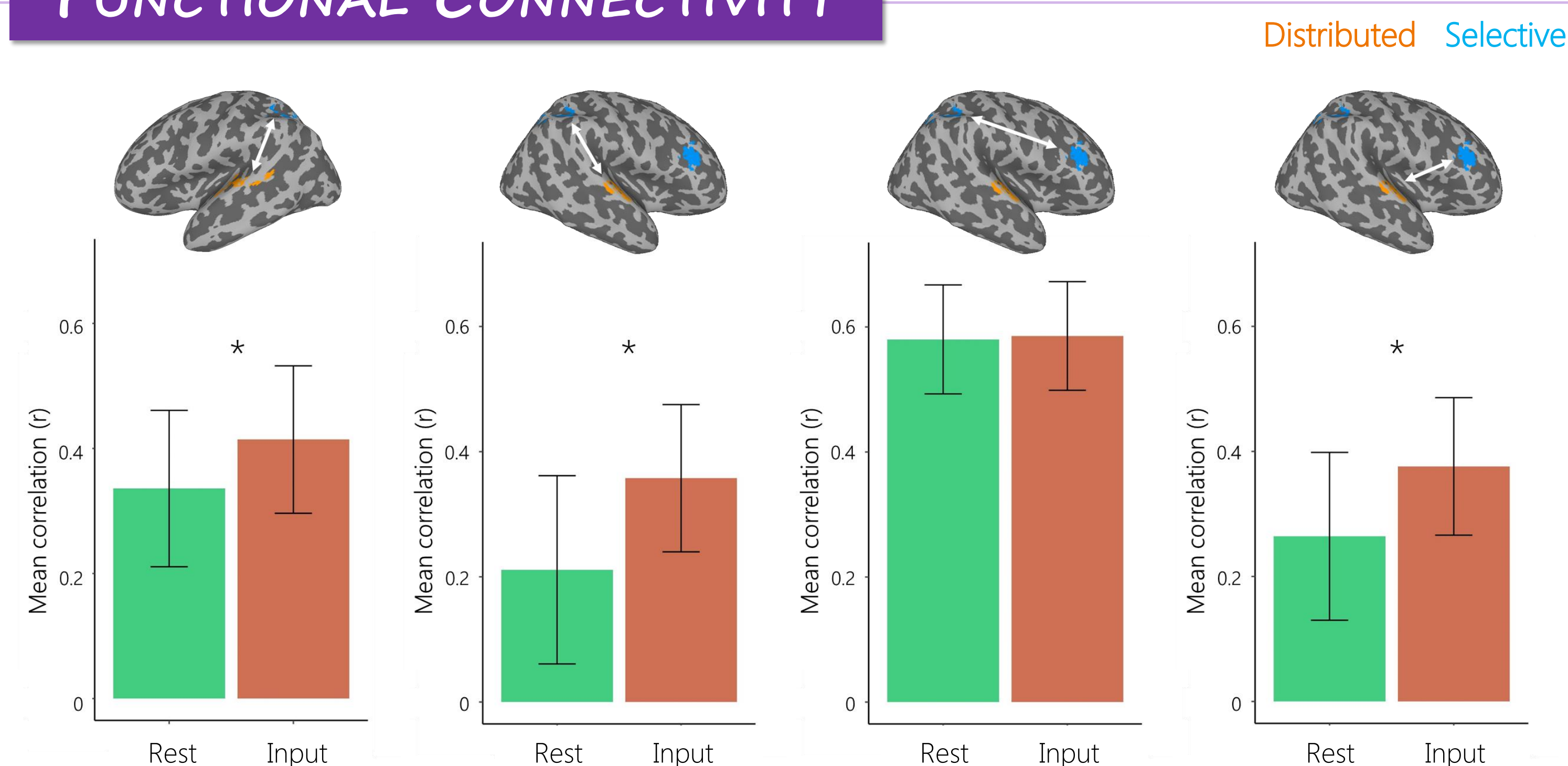
Attention Type



Interaction



FUNCTIONAL CONNECTIVITY



ROIs defined by results from a 2x3 ANOVA. Correlations were calculated on the residual signals (after removing contributions of the effects).

SUMMARY

- Selective attention and Distributed attention activate qualitatively similar networks of brain regions. However, responses within each region were modulated by the type of attention and number of speakers.
- In **bilateral Auditory Cortex**:
 - Acoustic load had a similar effect, regardless of attention type.
 - Activation was overall stronger when performing Distributed attention. Perhaps reflects listening effort.
- In **bilateral Insula** responses were modulated by acoustic load, but this effect was more prominent under Distributed attention. Perhaps due to increased language processing demands.
- In **Right MFG** responses were modulated by number of speakers only under Distributed attention. In line with previous studies suggesting it is recruited differently based on specific attentional task demands.

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