

flux VIRTUAL
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Grey matter volume changes following early intervention in pre-readers at risk for dyslexia

Maria Economou, KU Leuven

Economou M.,[1,2] Vanderauwera J.,[2,3] Ghesquière P.,[2] Wouters J.,[1] and Vandermosten M.[1]

[1]Research group Experimental ORL, Department of Neurosciences, KU Leuven, Belgium
[2]Parenting and Special Education Research Unit, Faculty of Psychology and Educational Sciences, KU Leuven, Belgium
[3]Psychological Sciences Research Institute, Université Catholique de Louvain, Belgium

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Why study the effects of early intervention?

- Early childhood is a critical period for structural brain organization and learning-related plasticity
- At the same time, learning to read leads to substantial changes in brain structure and function
- Behavioral evidence suggests that reading remediation is most effective if it takes place during early reading development, however the neural impact of such intervention remains unexplored

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Objective

To investigate structural grey matter plasticity in at-risk pre-readers following an early literacy intervention

Study design

KG3



15 min game time
6 days/week ~12 weeks



Study design



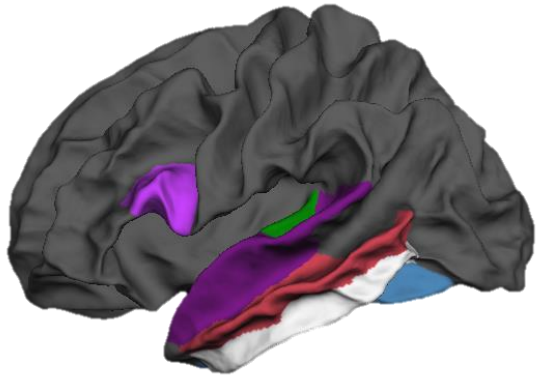
Group	Graphogame	Active Control	Non-risk control
Risk	✓	✓	
Intervention	✓	✓	
N	28	25	25
Pre-test age in months (SD)	64.7 (3.2)	65.6 (3.8)	66.7 (3.2)

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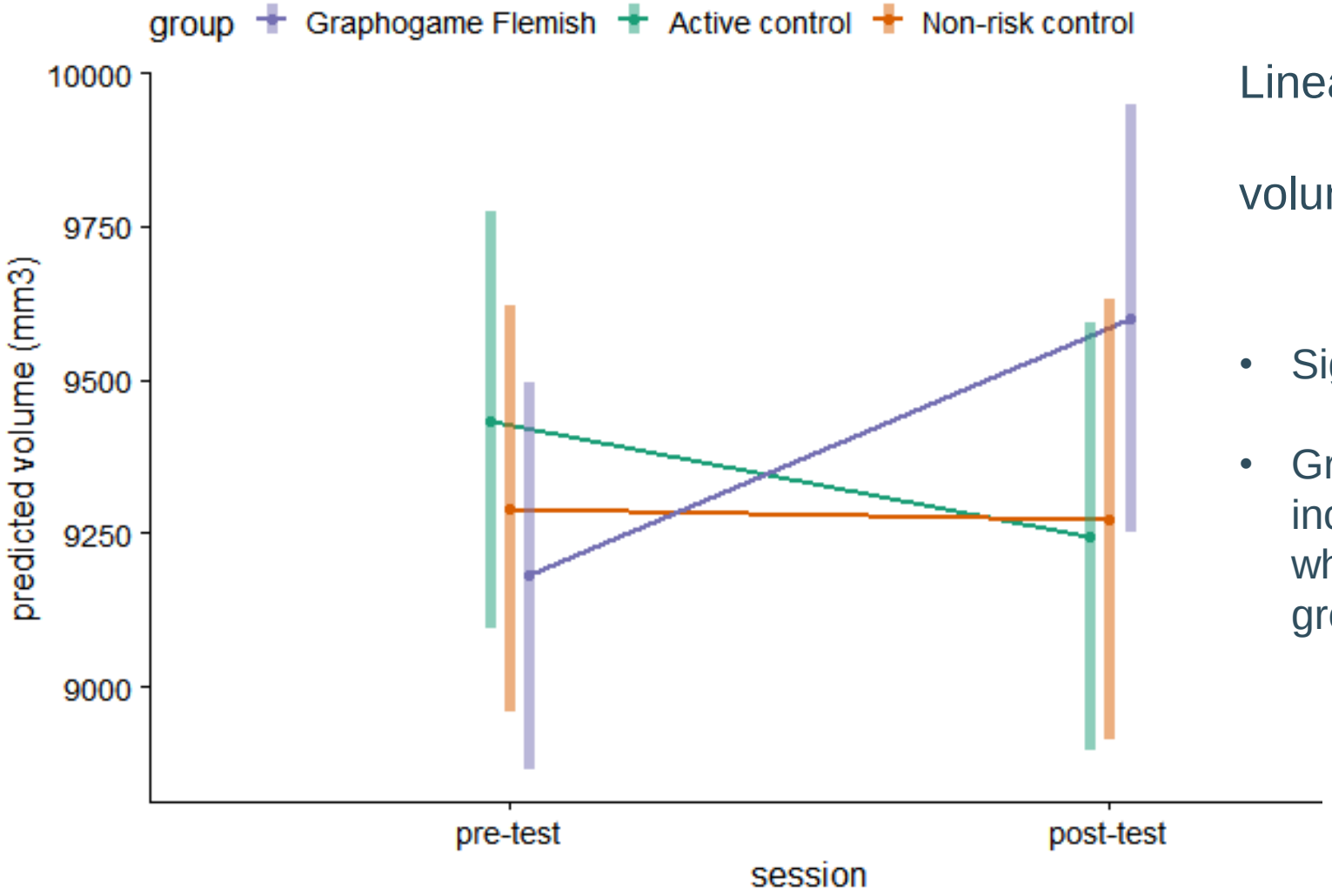


- T1-weighted whole-brain 3D-TFE
- Surface-based analysis in Freesurfer v6.0
- Cortical volume measured in six bilateral regions important for reading development



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Increased GMV following literacy intervention



Linear mixed effects model:

volume ~ group*session*region + eTIV

- Significant group*session interaction
- Graphogame group shows significantly increased volume from pre to post. which is not present in the other two groups (p=.0369, Bonferroni-adjusted)

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maria.economou@kuleuven.be

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