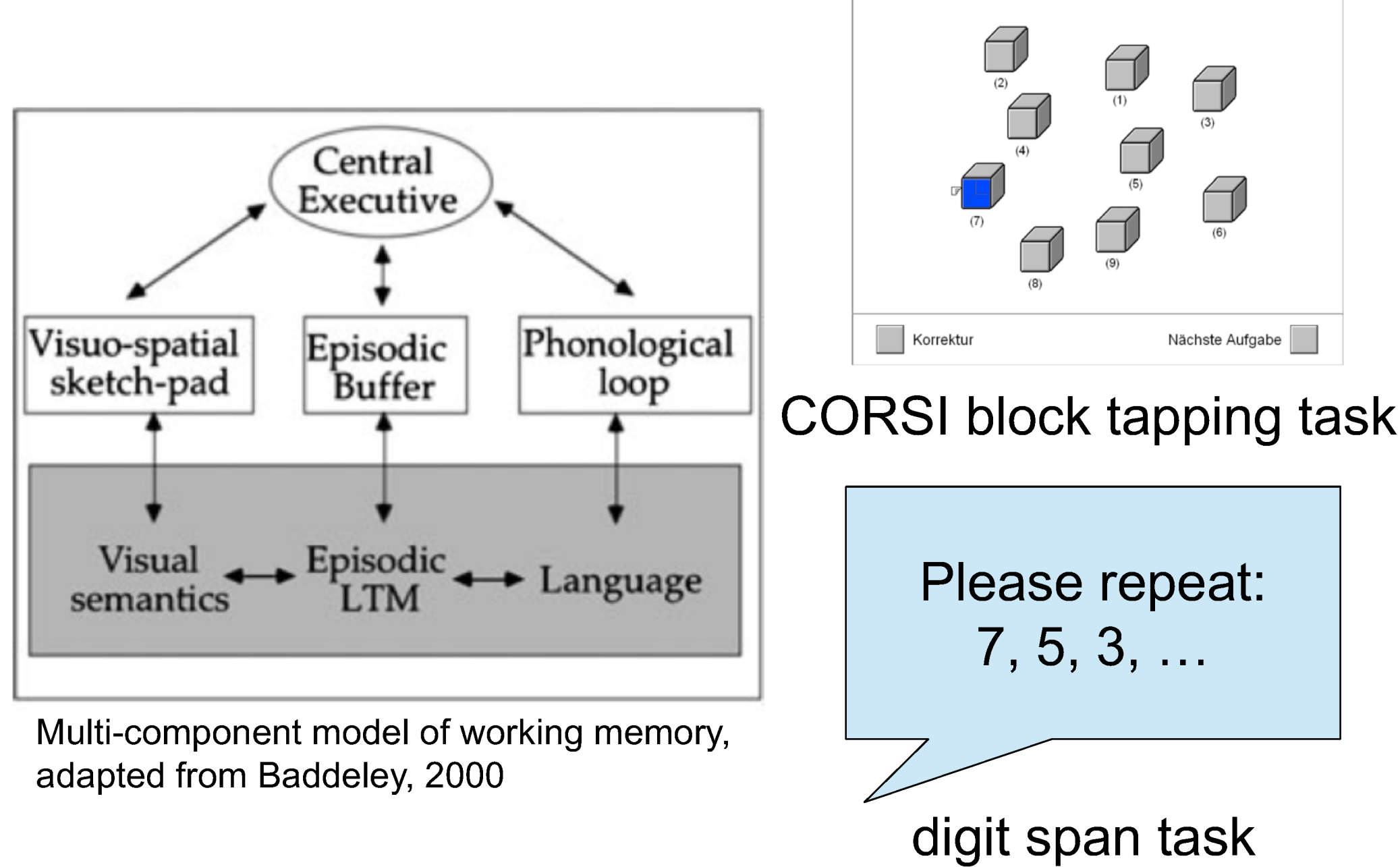
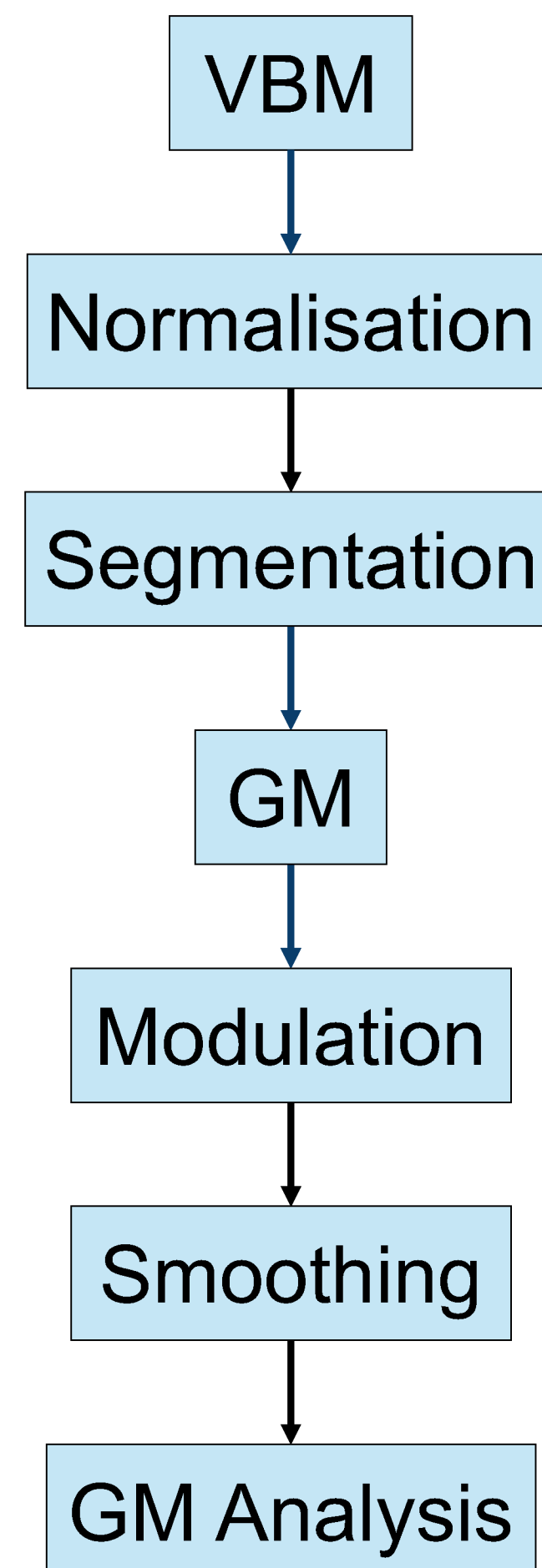


Introduction

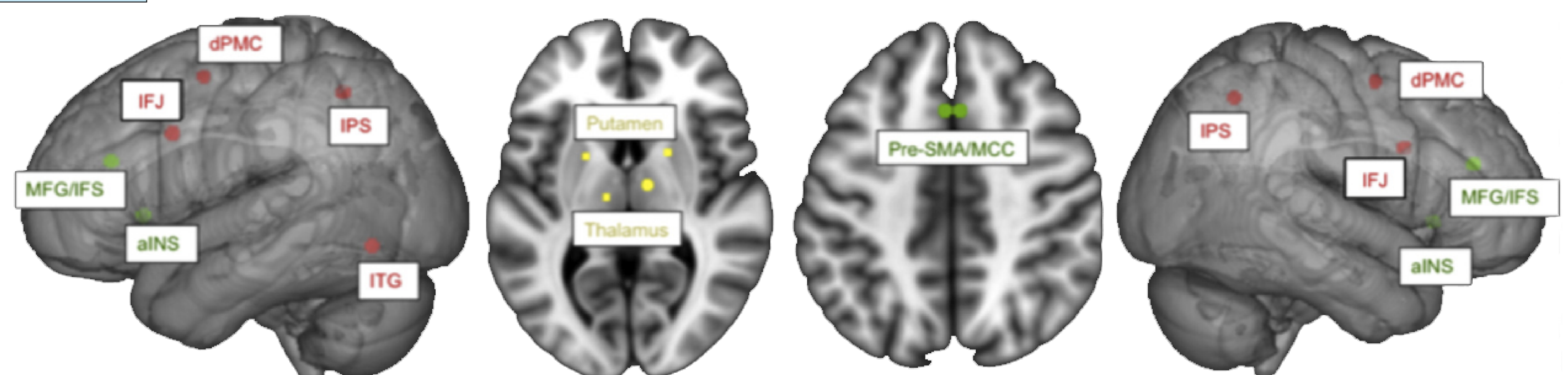
- **Working memory (WM)**: ability to store and manipulate information for a short period of time
- Measured by span tasks
 - increasingly longer sequences of stimuli have to be recalled in same or reversed order as presented
- **CORSI block tapping task** and **digit span task** to assess **visuospatial** and **verbal** subcomponents
- Structural underpinnings of WM remain unclear



Methods



- **Voxel-based morphometry (VBM)** for investigating association of grey matter volume (GMV) and performance on both recall versions of both tasks
- Whole-brain and regional analyses
- Regional analyses used **extended multiple demand network (eMDN)**
 - subsumes regions functionally connected to regions activated across multiple demands
- Covariates of no interest: age and gender
- T1-weighted imaging data of 765 subjects from the „1000BRAINS“ study was analysed
- Age range: 55 to 76 years (mean: 65.9 years, SD: 5,6 years)



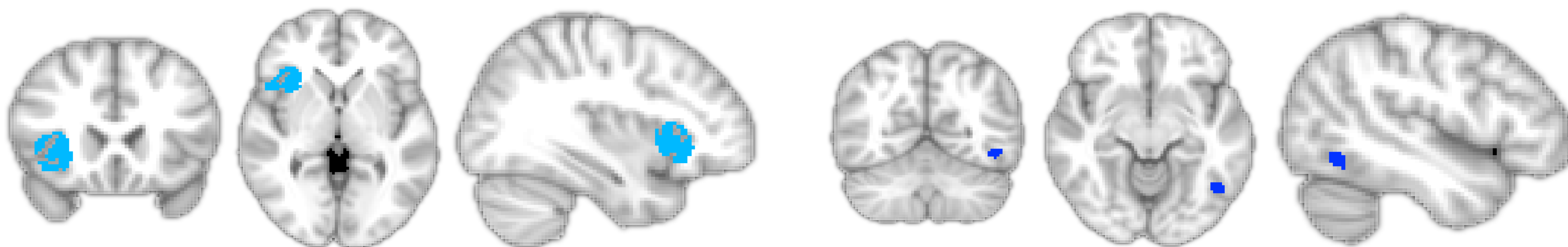
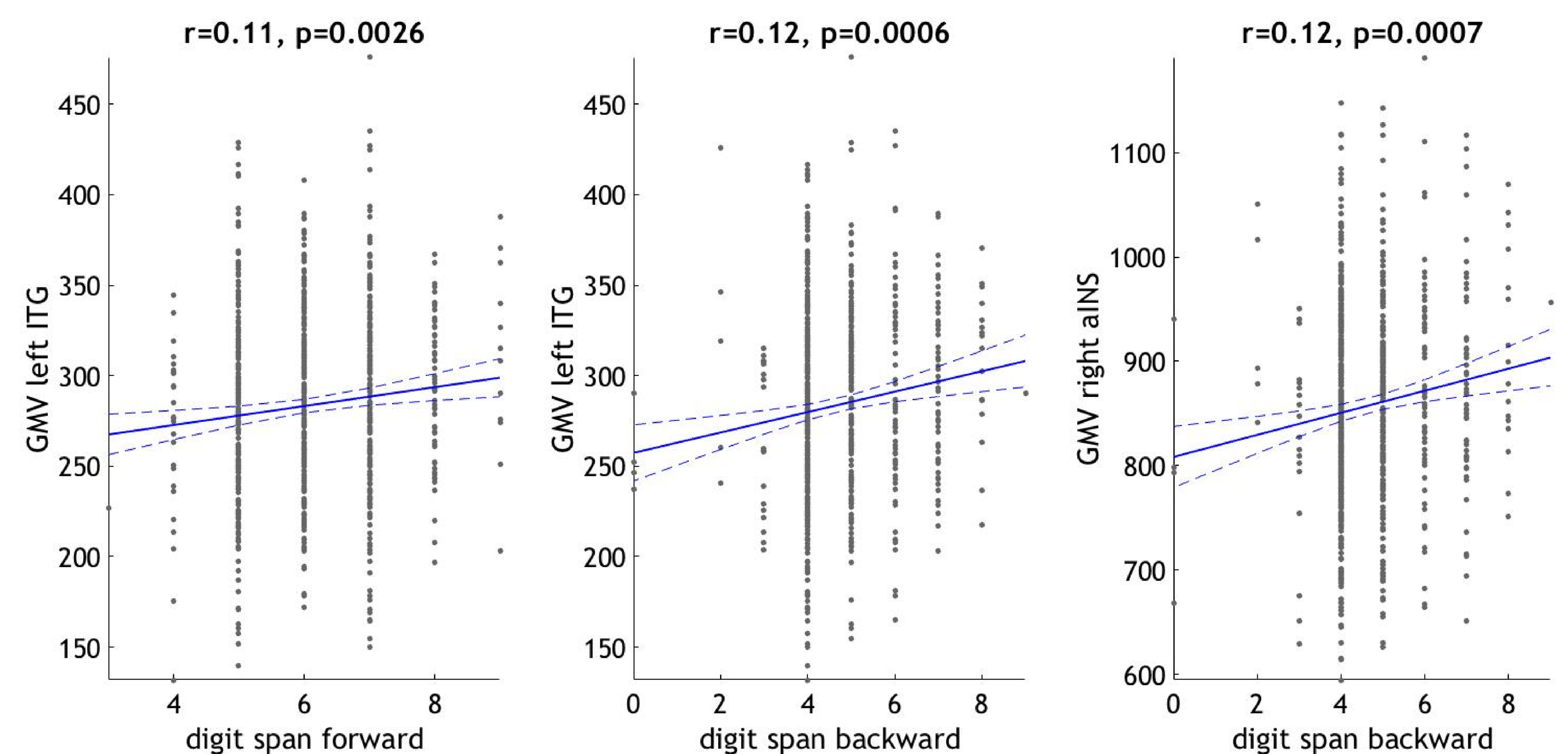
Results

1 Whole brain results.

- **No significant correlations** between GMV and performance in either recall version of either test

2 Regional results.

- CORSI block tapping task
 - **No significant correlations** between GMV in either region of the eMDN with performance on forward or backward recall
- Digit span task
 - Forward recall was positively correlated with GMV in the left inferior temporal gyrus (ITG) ($r(764)=0.11$, $p=0.0026$)
 - Backward recall was positively correlated with GMV in the right anterior insula (aINS) ($r(764)=0.12$, $p=0.0007$) and left ITG ($r(764)=0.12$, $p=0.0006$)



Left (light blue):
right anterior insula
Right (darker blue):
left inferior temporal gyrus

Discussion

- Findings of structural correlates of WM are inconsistent
- Insula involved in executive processes
 - Significant correlation for right aINS only for the backward digit span: **more executive control** involved in backward compared to forward recall
- Left ITG is linked to semantic processes, may play a role in verbal WM
- Significant correlations showed only **small effect sizes**
 - Similar to recent large sample studies using VBM
- Lack of significant results on whole-brain level:
 - **GM might not be relevant neural substrate** when investigating WM performance or differences between the visuospatial and verbal component
 - Other factors might have stronger contribution