

The association of olfactory function with cognitive performance among older adults: findings from the Sydney Memory and Ageing Study

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Background

- Olfactory dysfunction is increasingly recognised as an early marker of neurodegeneration and has been associated with poorer cognitive performance in older adults.
- Previous research has largely relied on cross-sectional designs, limiting understanding of whether olfactory dysfunction predicts cognitive decline over time and across specific cognitive domains.
- This study investigated the relationship between baseline olfactory function, longitudinal cognitive trajectories, and APOE $\epsilon 4$ status using data from the Sydney Memory and Ageing Study.

Aims

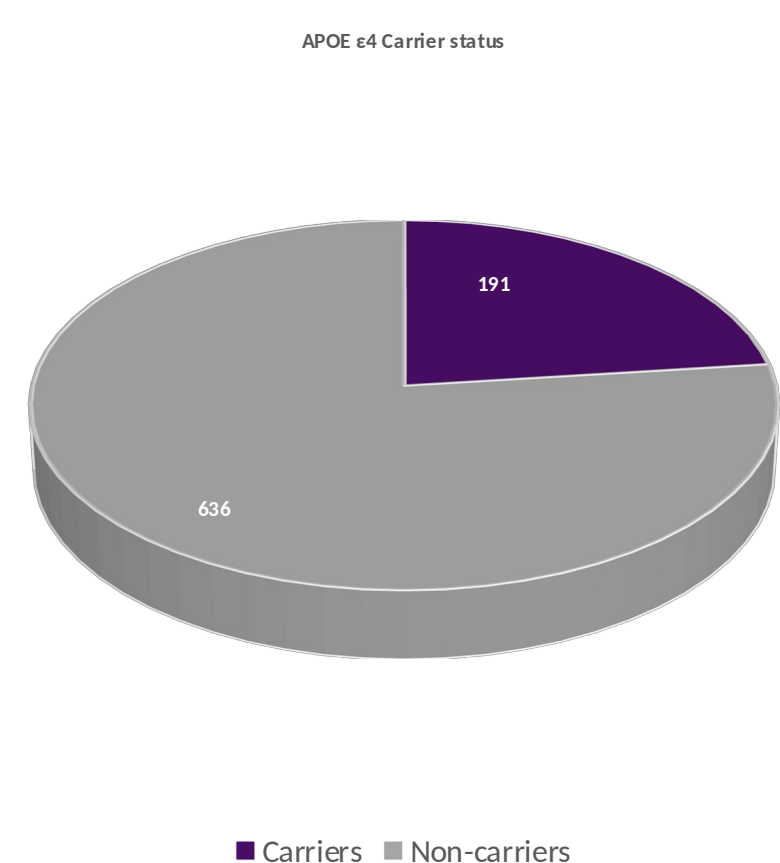
- To describe trajectories of cognitive performance over the study period.
- To examine the association between olfactory function and cognitive decline over time.
- To investigate whether APOE $\epsilon 4$ carrier status moderates the association between olfactory function and cognitive decline over time

The Sydney Memory and Ageing Study

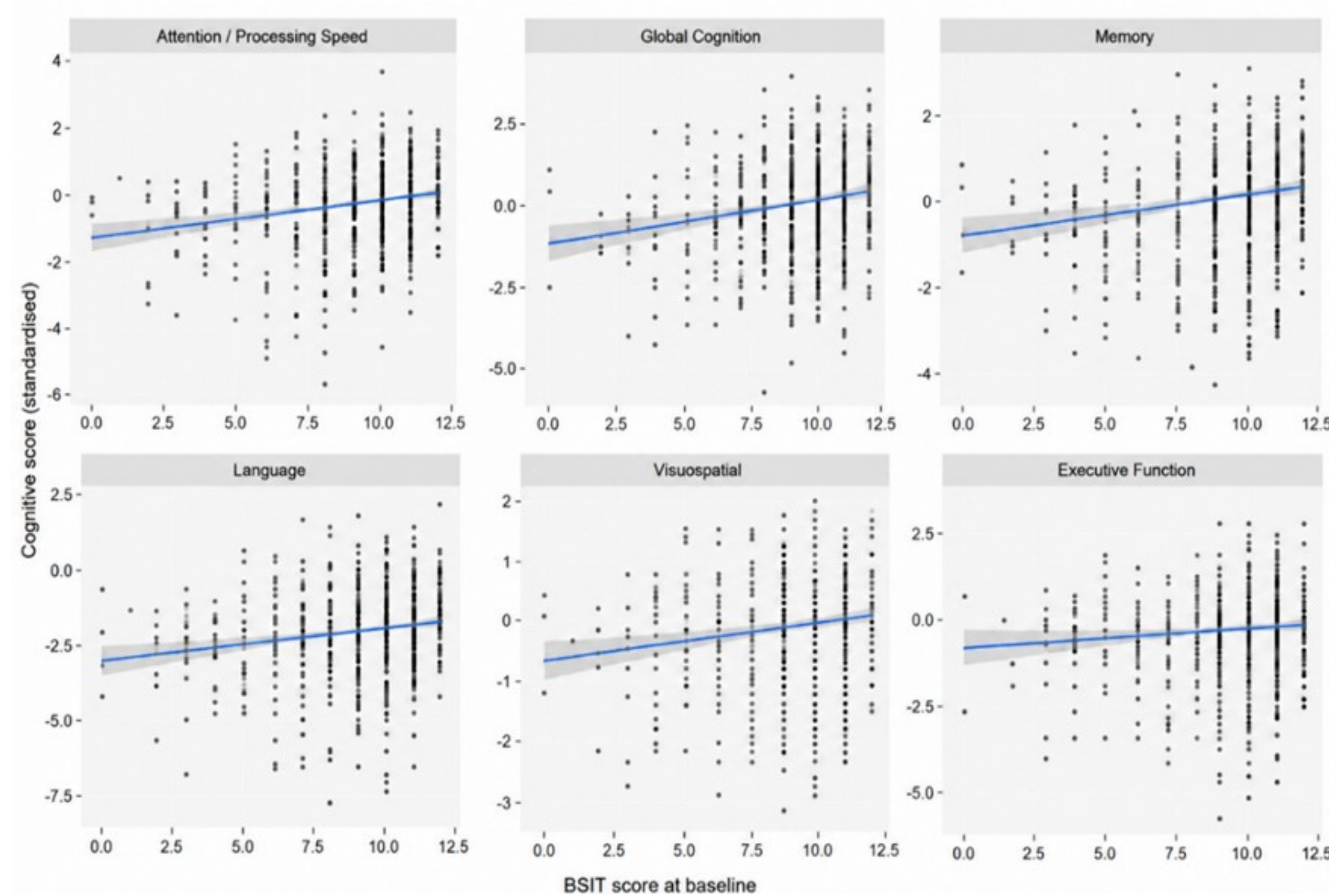
- Community-based longitudinal cohort study investigating cognitive ageing and dementia in older Australians.

- 1,037 adults aged 70–90 years without dementia were recruited from Sydney between 2005 and 2007.

- Participants completed comprehensive neuropsychological assessments, and health evaluations across multiple waves of follow-up, over 12 years.



Higher baseline olfactory function was associated with better cognitive performance across multiple cognitive domains



Materials & Methods

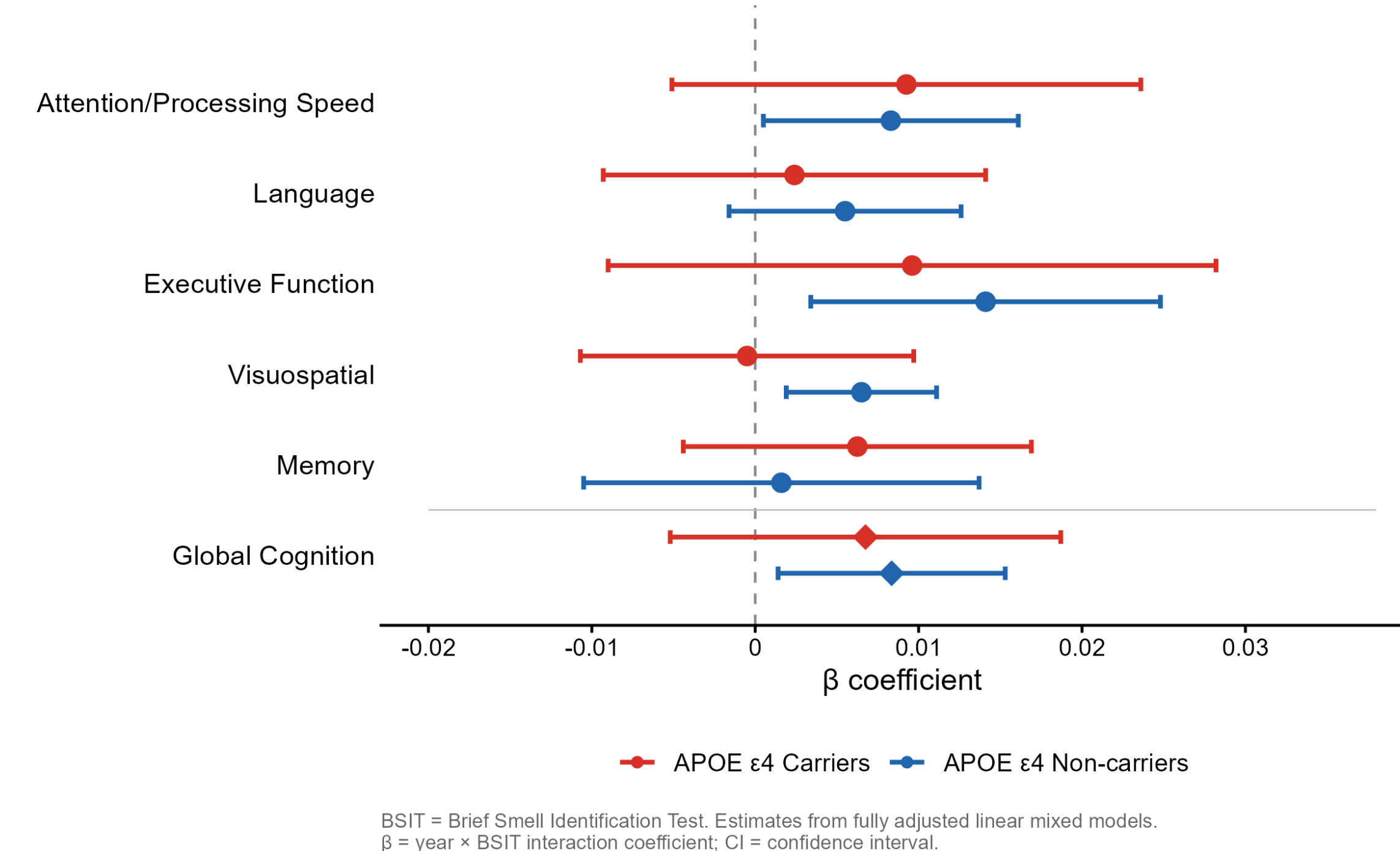
Secondary analysis of longitudinal data from the Sydney Memory and Ageing Study (MAS) involving 873 community-dwelling older adults aged 70–90 years.

Olfactory function assessed at baseline using the Brief Smell Identification Test (BSIT), with higher scores indicating better olfactory performance.

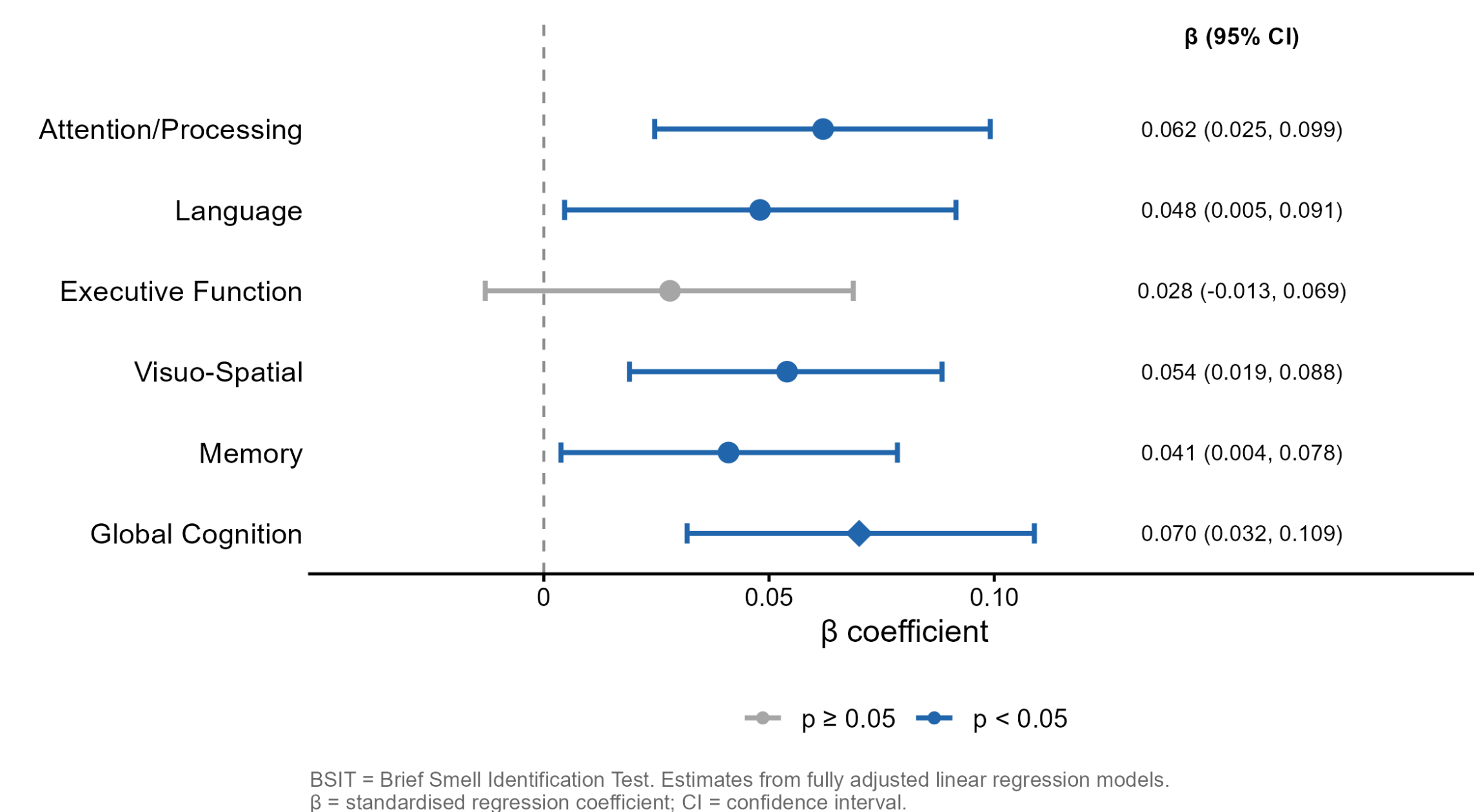
Cognitive performance measured across six domains (attention/processing speed, language, executive function, visuospatial function, memory, and global cognition) over 12 years of follow-up.

Multivariate linear regression and linear mixed-effects models examined associations between baseline olfactory function, cognitive performance, longitudinal cognitive decline, and APOE $\epsilon 4$ moderation while adjusting for demographic and cardiovascular covariates.

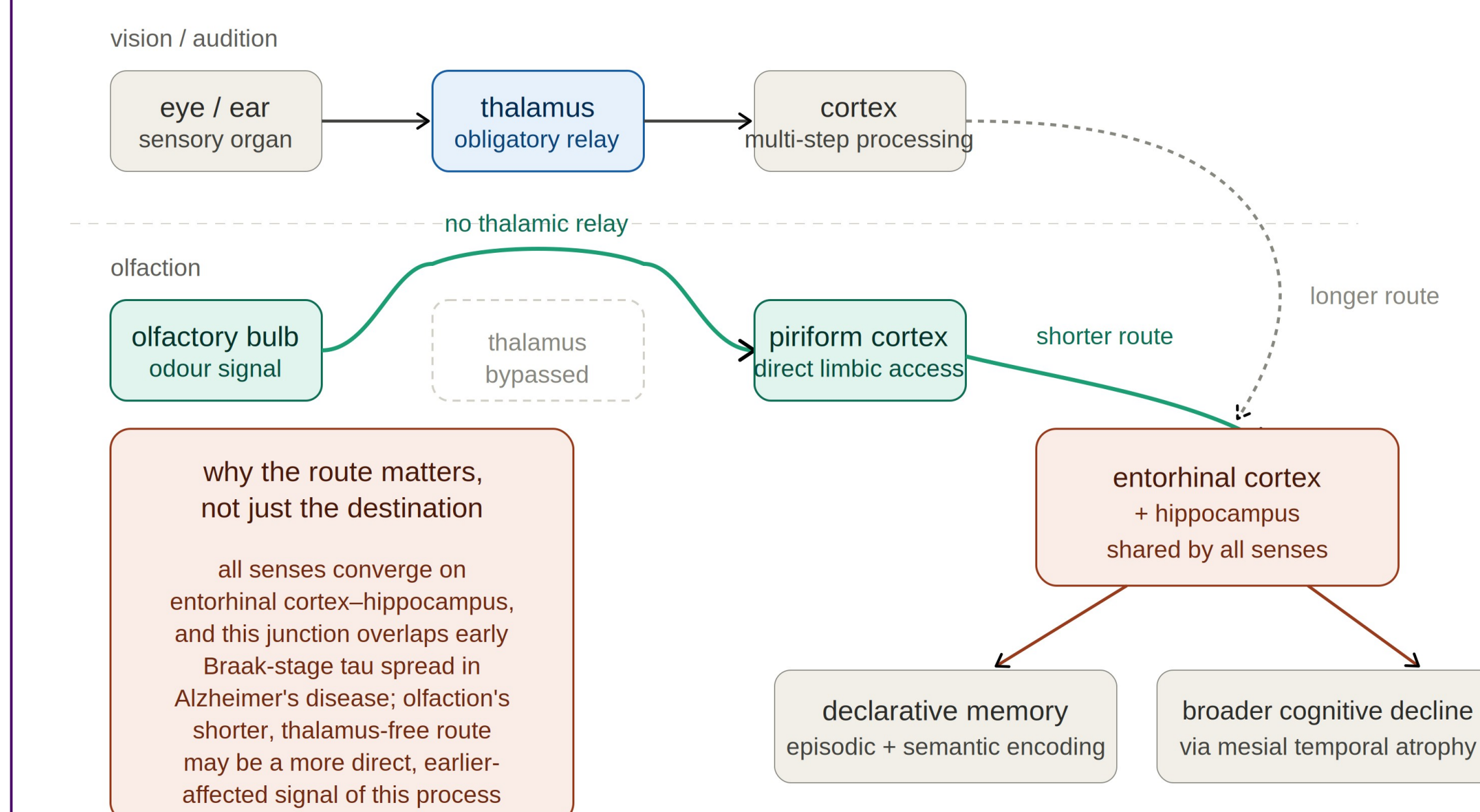
The association of olfactory function with cognitive decline and APOE $\epsilon 4$ carrier status



Association between baseline olfactory function and cognitive performance across domains



Possible mechanism- the anatomical framework and tau propagation



Conclusions

- Higher olfactory function was associated with better baseline cognitive performance across multiple domains, including attention/processing speed, visuospatial function, memory, language, and global cognition.
- Better baseline olfactory function predicted slower longitudinal decline in attention/processing speed and executive function over 12 years of follow-up.
- Olfactory assessment may represent a low-cost, non-invasive biomarker for identifying older adults at increased risk of cognitive decline and neurodegeneration.

Limitations & Future Directions

- Olfactory function was assessed only at baseline using the BSIT, which may be influenced by memory and language ability and limits assessment of olfactory change over time.
- Selective attrition and the relatively homogeneous older Australian cohort may limit generalisability of findings to broader and more diverse populations.
- Future longitudinal studies should incorporate repeated olfactory testing, neuroimaging, and biomarker analyses to better understand mechanisms linking olfaction and cognitive decline.

References

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