Where’s that Name?

Age-related Neural Changes and Word Finding Problems

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The Investigation

Objectives
- To understand why older people have a distressing increase in word finding problems
- To investigate the link between age-related structural atrophy and age-related changes in functional activation during successful and unsuccessful word retrieval

Plan
- Use task that elicits tip-of-the-tongue states (TOTs)
- Relate TOT increases to structural and functional changes, in order to assess age differences
- Compare better and worse performers to assess structural and functional characteristics of successful word retrieval

Tip-of-the-tongue task
Participants see pictures and decide if they Know, Don’t Know, or are having a TOT for the name

Preliminary Data: Structural changes & TOTs
Our aim is to combine structural and functional data, and we begin with the link between TOT rate and structural changes:

- Participants administered structural scan and perform TOT task
- TOT rates increase with age; this is associated with grey matter loss in the left insula (red area shown in figure), an area affiliated with retrieving the sounds of words
- Errors on intelligence task, Ravens Progressive Matrices (RPM), increase with age and are associated with grey matter loss but not in the insula, because RPM does not require word retrieval
- Next stage: TOT task in fMRI scanner

Potential Benefits

- Interventions: examining better and worse performance (both naturally occurring and experimentally induced) is the first step towards successful intervention
- Healthy and pathological ageing: examining the changes to cognition in normal ageing helps more accurately differentiate the nature of healthy and pathological ageing
- Negative stereotypes: examining the nature of normal memory changes in ageing will help battle assumptions that all declines are pathological, and characterizing better performers will help battle the belief that all older adults decline equally

Resources

- Development of panel of healthy adults aged 18 to 90 with cognitive assessment and structural scans, valuable for characterizing age-related changes to neural structure and its relation to cognitive change
- Advancement of methodologies for incorporating structural and functional neural data

Collaborators, Partners
- Professor Deborah Burke, Cognition and Aging Lab, Department of Psychology, Pomona College
- Dr. Paul Fletcher, Brain Mapping Unit, Department of Psychiatry, University of Cambridge
- Dr. Emmanuel Stamatakis, Centre for Speech, Language, and the Brain, Department of Experimental Psychology, University of Cambridge

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