

# Morpholexical Processes in Visual Word Recognition across the Adult Life Span: Major Cross-Sectional Changes

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5pm

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Room 802, Meng Wah Complex, HKU

## Abstract

Reading involves a complex set of analysis processes, where orthographic processing is followed by morphemic analysis and access to specific word meanings. Do these skills change over the adult lifespan, and if so how? We address these issues using spatiotemporally resolved MEG imaging methods on a sample from the CamCan population-derived cohort healthy individuals aged 18-88 years. Previous MEG studies with young adults identify reading-related regions in occipital, temporal and frontal cortex (Whiting et al., 2014). The current study investigates the timing and location of these processes across three groups of participants (Younger (ages: 22-38), Middle (ages: 46-60) and Older (ages: 70-88)). Participants read silently simple words (biscuit), consonant strings (hywc), and morphologically complex words (jumped, darkness). MEG data were source localised using subjects' structural MRI scans. Early visual evoked responses showed parallel responses bilaterally in the occipital pole, slowing slightly with age (~10 ms). Striking cross-sectional changes emerged, however, in multivariate analyses testing for brain regions involved in cognitively complex morpholexical processes. The Younger group, consistent with earlier research, showed strong early activation along left ventral and lateral temporal lobes. The Older group showed no stable activation in these regions, with a contrasting pattern of later activation in left posterior parietal and inferior frontal regions. A mixed set of responses were seen in the Middle group. Although behavioral data shows preserved reading proficiency across the adult lifespan, these spatiotemporally resolved data suggest age-related divergences in the neural systems involved. These divergences may reflect cross-sectional differences in neurocognitive reading strategies, or alternatively age-related changes in responses to task demands or in the roles of top-down processes as the sensory input degrades.

All are welcome. No registration is needed.



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## Prof. William Marslen-Wilson

### About the speaker

Prof. William Marslen-Wilson is an Honorary Professor of Language and Cognition at University of Cambridge. His research interests are in the cognitive science and neuroscience of language. He studies the comprehension of human language in the mind and the brain using interdisciplinary neuroimaging and multivariate analysis techniques aimed at identifying the neural processing streams that support the immediate interpretation of spoken utterances and written words. Prof. Marslen-Wilson's current research brings together neuroimaging (MEG, fMRI), behavioural, and neuropsychological data from contrasting languages (such as Arabic, Russian, Chinese and English) to determine the specific properties of human language as a neuro-cognitive system, in its broader neurobiological and evolutionary context. A major new strand focuses on visual information processing systems supporting skilled reading, working chiefly in MEG source space using multivariate methods.