

Ageing affects test taking, not language, study shows

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The ability to understand language could be much better preserved into old age than previously thought, according to researchers from the University of Cambridge, who found older adults struggle more with test conditions than language processing.

Scientists from the Cambridge Centre for Ageing and Neuroscience (Cam-CAN) scanned participants during testing and found that the areas

of the [brain](#) responsible for language performed just as well in [older adults](#) as in younger ones.

The research, published in the *Journal of Neuroscience*, suggests that increased neural activation in the frontal brain regions of older adults reflects differences in the way they respond to the demands of the task compared with younger adults, rather than any difference in language processing itself.

"These findings suggest our ability to understand language is remarkably preserved well into old age, and it's not through some trick of the mind, or reorganisation of the brain," says co-author Professor Lorraine Tyler, who leads Cam-CAN. "Instead, it's through the continued functioning of a well-used [language processing](#) machine common to all humans."

Professor Tyler says cognitive neuroscientists attempting to explain how the mind and brain work typically approach the question with tasks designed to measure particular cognitive abilities, such as memory or language. However, it's rarely as simple as that, she says, and tasks never end up measuring only one thing.

"Scientists claim that they are studying language, when really they are studying language plus your motivation to do well, plus your understanding of the instructions, plus your ability to focus, and so on," says lead author Dr Karen Campbell, now based at Harvard University. "These poorly defined tasks become even more problematic when it comes to studying the older brain, because older adults sometimes show increased [neural activation](#) in frontal brain regions, which is thought to reflect a change in how older brains carry out a given cognitive function. However, this extra activation may simply reflect differences in how young and older adults respond to the demands of the task."

Campbell and her Cam-CAN colleagues tried to isolate the effect of the

testing by scanning 111 participants aged 22-87 using [functional magnetic resonance](#) imaging (fMRI) while they either passively listened to sentences or decided if the sentences were grammatical or not.

The researchers found that simply listening to and comprehending language, as we do in everyday life, "lights up" brain networks responsible for hearing and language, whereas performing a cognitive task with the same sentences leads to the additional activation of several task-related networks.

Age had no effect on the [language](#) network itself, but it did affect this network's ability to "talk with" other task-related networks.

More information: K. L. Campbell et al. Robust Resilience of the Frontotemporal Syntax System to Aging, *Journal of Neuroscience* (2016). [DOI: 10.1523/JNEUROSCI.4561-15.2016](https://doi.org/10.1523/JNEUROSCI.4561-15.2016)

Provided by University of Cambridge

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