How the bilingual brain copes with aging

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Older bilingual adults compensate for age-related declines in brainpower by developing new strategies to process language, according to a recent study published in the journal *Aging, Neuropsychology, and Cognition*.

Concordia University researchers studied two groups of fluently bilingual adults – aged from 19 to 35 and from 60 to 81 years old – and found significant age-related differences in the manner their brains interpreted written language.

"We wanted to know whether older adults relied on context to process interlingual homographs (IH) – words that are spelled the same in both languages but have a different meaning," says lead author Shanna Kousaie, a PhD candidate at Concordia University's Department of Psychology and Centre for Research in Human Development (CRDH).

Does "coin" mean "money" or "corner"?

As part of the study, subjects were asked to read hundreds of trios of words. The first word in the triplet was in either English or French, indicating the language of the IH, putting it in context for readers. The second was an IH – a word such as "coin," which means "money" in English but "corner" in French. The third word was one that might or might not help the person understand the meaning of the IH more quickly.

Subjects' neurophysiological responses to these words were recorded using an electroencephalograph, an instrument that records the brain's

electrical activity.

Kousaie and co-author Natalie Phillips, a professor in Concordia's Department of Psychology and member of the CRDH, found that the older adults processed these letter strings differently, using context to a greater extent to determine meaning.

These findings were based on the relative speed of responses for younger and older bilingual research participants and on the differences in their EEG recordings as they "processed" the word triplets. Both measures indicated younger participants relied less on the first (contextual) word when processing the trios of words in the test.

"As we get older, our working memory capacity and ability to quickly process words declines," says Phillips. "As a result, older adults become a little more strategic with capacity. It's important to stress these are normal and mild age-related changes. Participants didn't have any cognitive deficit. Rather, they were making the best use of mental resources by using context to help them process language."

More than half the world is bilingual

These findings shed light on how bilingual adults process language. Although some 50 per cent of the world's population is bilingual, much language research has so far focused only on single language speakers.

Understanding the effects of bilingualism on the brain may be of more than academic interest. Evidence is mounting that bilingual people have a cognitive advantage over monolingual individuals because their brains are accustomed to "manipulating" two languages.

"Our study suggests that bilingual adults, as they age, are able to find strategies to compensate for changes in language comprehension," says

Phillips.

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