

Bilingualism could offset brain changes in Alzheimer's

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Having two languages exercises specific brain regions,” says psychology professor Natalie Phillips. Credit: Concordia University

After more than a decade of research, this much we know: it's good for your brain to know another language.

A new Concordia study goes further, however, focusing specifically on the effects of knowing a second [language](#) for [patients](#) with Alzheimer's disease (AD) and [mild cognitive impairment](#) (MCI; a risk state for AD).

"Most of the previous research on brain structure was conducted with healthy younger or older adults," says Natalie Phillips, a professor in the Department of Psychology.

"Our new study contributes to the hypothesis that having two languages exercises specific brain regions and can increase cortical thickness and grey matter density. And it extends these findings by demonstrating that these structural differences can be seen in the brains of multilingual AD and MCI patients."

Phillips's study, led by recent Concordia psychology grad Hilary D. Duncan (PhD 17), is soon to be published in *Neuropsychologia* (Jan, 2018).

New methods: Enter the MRI

Phillips and her team are the first to use high-resolution, whole-brain MRI data and sophisticated analysis techniques to measure [cortical thickness](#) and tissue density within specific brain areas.

Namely, they investigated language and cognition control areas in the frontal regions of the brain, and medial temporal lobe structures that are important for memory and are brain areas known to atrophy in MCI and AD patients.

"Previous studies used CT scans, which are a much less sensitive measure," says Phillips, founding director of Concordia's Cognition, Aging and Psychophysiology (CAP) Lab.

The study looked at MRIs from participating patients from the Jewish General Hospital Memory Clinic in Montreal.

Their sample included 34 monolingual MCI patients, 34 multilingual MCI patients, 13 monolingual AD patients and 13 multilingual AD patients.

Phillips believes their study is the first to assess the structure of MCI and AD patients' language and cognition control regions. It is also the first to demonstrate an association between those regions of the brain and memory function in these groups, and the first to control for immigration status in these groups.

"Our results contribute to research that indicates that speaking more than one language is one of a number of lifestyle factors that contributes to cognitive reserve," Phillips says.

"They support the notion that multilingualism and its associated cognitive and sociocultural benefits are associated with brain plasticity."

What's next?

Phillips and her team are already building on their findings.

"Our study seems to suggest that multilingual people are able to compensate for AD-related tissue loss by accessing alternative networks or other [brain](#) regions for memory processing. We're actively investigating that hypothesis now."

More information: Hilary D. Duncan et al, Structural brain differences between monolingual and multilingual patients with mild cognitive impairment and Alzheimer disease: Evidence for cognitive reserve, *Neuropsychologia* (2017). [DOI](#):

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