

Studying a second language boosts cognitive function

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Learning a second language is an effective and enjoyable way to improve brain health, reports a new study that was jointly conducted by Baycrest and York University.

Researchers found that older adults who studied Spanish showed similar

improvements in certain critical cognitive skills as did those who engaged in brain [training](#) activities that targeted those skills. These results are remarkable given that brain training focuses specifically on improving these aspects of cognition, while [language](#) learning does not. As well, those who learned Spanish reported greater enjoyment than those who engaged in brain training.

This study is among the first to examine whether the process of learning a language can benefit [brain health](#) in similar ways as bilingualism.

"These results are exciting because they indicate that older adults can reap cognitive benefits from an enjoyable activity in which they might want to participate, regardless of these benefits," says Dr. Jed Meltzer, Baycrest's Canada Research Chair in Interventional Cognitive Neuroscience, a neurorehabilitation scientist at Baycrest's Rotman Research Institute (RRI) and the lead author on this study.

Evidence suggests that bilingualism has a protective effect on brain health, with bilinguals developing dementia later in life than monolinguals. However, little is known about the cognitive impact of the process of learning a [second language](#) without becoming fully bilingual.

"The participants in our study showed significant cognitive improvements without becoming nearly fluent in Spanish, which suggests that you don't have to be bilingual for your brain to benefit from working with another language," says Dr. Ellen Bialystok, Distinguished Research Professor in the Department of Psychology at York University, and Associate Scientist at the RRI. "This is encouraging since bilingualism is often reached early in life and difficult to achieve in adulthood, while we can choose to learn another language at any age to reap some of the cognitive benefits enjoyed by bilingual individuals."

In the study, the researchers recruited 76 older adults aged 65-75. All participants spoke only one language, were cognitively healthy, had never formally studied Spanish before and had not studied any other language in the past 10 years.

Participants were randomly assigned to one of three groups: language learning, brain training or a waitlist (with no language learning or brain training), which served as the control group. For 16 weeks, those in the language learning group spent 30 minutes a day, five days a week learning Spanish using Duolingo, an online language learning app. Those in the brain training group spent the same amount of time but used BrainHQ by Posit Science.

The researchers assessed participants' performance on specific cognitive tasks before and after the 16 weeks. These tasks were similar to the exercises in BrainHQ. At the end of the intervention, they also measured participants' adherence to the learning schedule and their enjoyment of the program they followed (language learning or brain training).

They found that participants in the language learning group showed similar improvements as the brain training group in two areas of cognition: working memory and executive function—that is, the ability to manage conflicting information, stay focused and avoid distractions.

In contrast, only the brain training group showed improvements in processing speed. This result was expected, since brain training specifically targets this skill by adding time pressure to each activity, while the language learning settings used in this study did not include any such pressure.

Additionally, the language learning group reported more enjoyment of their program than the brain training group. This was reflected in their answers to a questionnaire as well as their adherence to the program: the

[language learning](#) group followed the learning schedule more consistently than the [brain](#) training group did.

"Besides the [cognitive benefits](#), learning a second language may enrich [older adults'](#) lives in other important ways—for instance, by leading to new friendships or opening the door to a new culture or travel, helping them live life to the fullest," says Dr. Meltzer, who is also an Associate Professor in the Departments of Psychology and Speech-Language Pathology at the University of Toronto.

More information: Improvement in executive function for older adults through smartphone apps: a randomized clinical trial, *Aging Neuropsychology and Cognition*, [DOI: 10.1080/13825585.2021.1991262](https://doi.org/10.1080/13825585.2021.1991262)

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