

# Learning music or speaking another language leads to more efficient brains

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Dr. Claude Alain, first author of the paper and senior scientist at Baycrest's Rotman Research Institute. Credit: Provided by Baycrest Health Sciences

Whether you learn to play a musical instrument or speak another language, you're training your brain to be more efficient, suggests a Baycrest study.

Researchers found that musicians and people who are bilingual utilized fewer brain resources when completing a working memory task, according to recently published findings in the journal, *Annals of the New York Academy of Sciences*.

Individuals with either a musical or bilingual background activated different brain networks and showed less brain activity than people who only spoke one [language](#) and didn't have formal music training to complete the task, according to the study's findings.

"These findings show that musicians and bilinguals require less effort to perform the same task, which could also protect them against cognitive decline and delay the onset of dementia," says Dr. Claude Alain, first author of the paper and senior scientist at Baycrest's Rotman Research Institute. "Our results also demonstrated that a person's experiences, whether it's learning how to play a [musical instrument](#) or another language, can shape how the brain functions and which networks are used."

Musicians and people who are [bilingual](#) have long been shown to have a better working memory, the ability to keep things in mind, such as remembering a phone number, a list of instructions or doing mental math. But it remains a mystery as to why this is the case. This is the first brain imaging study looking at all three groups and this work uncovers how these activities boost different parts of the brain among individuals, adds Dr. Alain.

The study looked at the brains of 41 young adults between the ages of 19-35, who fit into three categories: English-speaking non-musicians,

musicians who only spoke English and bilinguals who didn't play a musical instrument. Brain imagery was captured for each participant as they were asked to identify whether the sound they heard was the same type as the previous one. Sounds from musical instruments, the environment and humans were among those used in the study. Participants were also asked to identify if what they heard was coming from the same direction as the previous noise.

Musicians remembered the type of sound faster than individuals in the other groups, while bilinguals and musicians performed better on the location task. Bilinguals performed at about the same level as individuals who spoke only one language and didn't play a musical instrument on remembering the sound, but they still showed less [brain activity](#) when completing the task.

"People who speak two languages may take longer to process sounds since the information is run through two language libraries rather than just one," says Dr. Alain, who is also an associate professor at the University of Toronto's Institute of Medical Science and the Department of Psychology. "During this task, the brains of bilinguals showed greater signs of activation in areas that are known for speech comprehension, supporting this theory."

As next steps, researchers are exploring the impact of art and musical training among adults to see if this leads to changes in [brain](#) function.

**More information:** Claude Alain et al, Different neural activities support auditory working memory in musicians and bilinguals, *Annals of the New York Academy of Sciences* (2018). [DOI: 10.1111/nyas.13717](https://doi.org/10.1111/nyas.13717)

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