Childhood music lessons may provide lifelong boost in brain functioning

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Older people who spent a significant amount of time throughout life playing a musical instrument perform better on some cognitive tests than individuals who did not play an instrument. Credit: Courtesy Ricardo Vasquez

Those childhood music lessons could pay off decades later - even for those who no longer play an instrument - by keeping the mind sharper as people age, according to a preliminary study published by the American Psychological Association.

The study recruited 70 healthy adults age 60 to 83 who were divided into groups based on their levels of musical experience. The musicians performed better on several cognitive tests than individuals who had never studied an instrument or learned how to read music. The research findings were published online in the APA journal *Neuropsychology*.

"Musical activity throughout life may serve as a challenging cognitive exercise, making your brain fitter and more capable of accommodating the challenges of aging," said lead researcher Brenda Hanna-Pladdy, PhD. "Since studying an instrument requires years of practice and learning, it may create alternate connections in the brain that could compensate for cognitive declines as we get older."

While much research has been done on the cognitive benefits of musical activity by children, this is the first study to examine whether those benefits can extend across a lifetime, said Hanna-Pladdy, a clinical neuropsychologist who conducted the study with cognitive psychologist Alicia MacKay, PhD, at the University of Kansas Medical Center.

The three groups of study participants included individuals with no musical training; with one to nine years of musical study; or with at least 10 years of musical training. All of the participants had similar levels of education and fitness and didn't show any evidence of Alzheimer's disease.

All of the musicians were amateurs who began playing an instrument at about 10 years of age. More than half played the piano while approximately a quarter had studied woodwind instruments such as the flute or clarinet. Smaller numbers performed with stringed instruments, percussion or brass instruments.

The high-level musicians who had studied the longest performed the best on the cognitive tests, followed by the low-level musicians and non-musicians, revealing a trend relating to years of musical practice. The high-level musicians had statistically significant higher scores than the non-musicians on cognitive tests relating to visuospatial memory, naming objects and cognitive flexibility, or the brain's ability to adapt to new information.

The brain functions measured by the tests typically decline as the body ages and more dramatically deteriorate in neurodegenerative conditions such as Alzheimer's disease. The results "suggest a strong predictive effect of high musical activity

throughout the lifespan on preserved cognitive functioning in advanced age," the study stated.

Half of the high-level musicians still played an instrument at the time of the study, but they didn't perform better on the cognitive tests than the other advanced musicians who had stopped playing years earlier. This suggests that the duration of musical study was more important than whether musicians continued playing at an advanced age, Hanna-Pladdy says.

"Based on previous research and our study results, we believe that both the years of musical participation and the age of acquisition are critical," Hanna-Pladdy says. "There are crucial periods in brain plasticity that enhance learning, which may make it easier to learn a musical instrument before a certain age and thus may have a larger impact on brain development."

The preliminary study was correlational, meaning that the higher cognitive performance of the musicians couldn't be conclusively linked to their years of musical study. Hanna-Pladdy, who has conducted additional studies on the subject, says more research is needed to explore that possible link.

More information: "The Relation Between Instrumental Musical Activity and Cognitive Aging," Brenda Hanna-Pladdy, PhD, and Alicia MacKay, PhD, University of Kansas Medical Center; Neuropsychology, Vol. 25, No. 3

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