

# Musical training shapes brain anatomy and affects function

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New findings show that extensive musical training affects the structure and function of different brain regions, how those regions communicate during the creation of music, and how the brain interprets and integrates sensory information. The findings were presented at Neuroscience 2013, the annual meeting of the Society for Neuroscience and the world's largest source of emerging news about brain science and health.

These insights suggest potential new roles for musical training including fostering plasticity in the brain, an alternative tool in education, and treating a range of learning disabilities.

Today's new findings show that:

- Long-term high level musical training has a broader impact than previously thought. Researchers found that musicians have an enhanced ability to integrate [sensory information](#) from hearing, touch, and sight (Julie Roy, abstract 550.13, see attached summary).
- The age at which musical training begins affects brain anatomy as an adult; beginning training before the age of seven has the greatest impact (Yunxin Wang, abstract 765.07 see attached summary).
- Brain circuits involved in musical improvisation are shaped by systematic training, leading to less reliance on working memory and more extensive connectivity within the brain (Ana Pinho, MS, abstract 122.13, see attached summary).

Some of the brain changes that occur with musical training reflect the automation of task (much as one would recite a multiplication table) and the acquisition of highly specific sensorimotor and cognitive skills required for various aspects of musical expertise.

"Playing a musical instrument is a multisensory and motor experience that creates emotions and motions—from finger tapping to dancing—and engages pleasure and reward systems in the brain. It has the potential to change brain function and structure when done over a long period of time," said press conference moderator Gottfried Schlaug, MD, PhD, of Harvard Medical School/Beth Israel Deaconess Medical Center, an expert on music, neuroimaging and [brain plasticity](#). "As today's findings show, intense [musical training](#) generates new processes within the [brain](#), at different stages of life, and with a range of impacts on creativity, cognition, and learning."

Provided by Society for Neuroscience

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