

## Musical Training Shapes Brain Anatomy and Affects Function— Neuroscience 2013

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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 a Monday, November 11 news conference 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. 30,000 scientists are attending this meeting in San

Diego. 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); 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); 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). 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, M.D., Ph.D., 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." This research was supported by national funding agencies such as the National Institutes of Health, as well as private and philanthropic organizations. Find more information about music, learning, and brain development at [BrainFacts.org](http://BrainFacts.org). Neuroscience 2013 continues through Wednesday, November 13.