

Music and Brain Development

The "Mozart Effect" refers to the study by Rauscher, Shaw, and Ky where 36 college students listened to 10 minutes of a Mozart sonata and then **scored higher on subsequent spatial-temporal tasks** than after listening to relaxation instructions or silence [(1993). Music and spatial task performance. *Nature*, 365, 611].

Research shows when a child studies a musical instrument **both left and right hemispheres of the brain** are used. These are the same areas that are **used for analytical and mathematical thinking** [Dee, Dickinson (1993). "Music and the mind," *New Horizons for Learning*].

A Canadian research study found that taking music lessons improves children's memory and learning ability by promoting different patterns of brain development. Children 4-6 years-old **performed better on a standard memory test** than those who were not taught music. The researchers found that **music helped with the brain's wiring for general cognitive functions related to memory and attention**. Dr. Takako Fujioka says, "It is clear that music is good for children's cognitive development and that music should be a part of the pre-school and primary school curriculum" [(2006). "Musical kids more likely to hear the sweet sounds of success." *Education*. Issue 239].

Researchers at the University of Konstanz in Germany discovered that exposure to music **rewires neural circuits in the brain**. They scanned the brains of nine string players using magnetic resonance imaging. They found the amount of somatosensory cortex dedicated to the thumb and fifth finger of the left hand was significantly larger than in nonplayers. How long the musicians practiced each day did not affect the cortical map, but the age at which they started playing did. **The younger they began, the more cortex they had** [Begley, S. & Hager, M. (1996). "Your child's brain." *Newsweek*. Vol. 127, issue 8].

Music exercises many different parts of the brain, both left and right. Synapses in the brain grow stronger with use and weaker with disuse. Norman M. Weinberger, a founding member of the Center for the Neurobiology of Learning and Memory and Professor for the Department of Psychobiology at the University of California, Irvine, says, "Brain scans taken during musical performances show that **virtually the entire cerebral cortex is active while musicians are playing**. . . . Making music actively engages the brain's synapses, and there is good reason to believe that it **increases the strengths of connections among neurons**" [(November 1998). "The music in our minds." *Educational Leadership*].

According to the Institute for Music and Neurologic Function, **both sides of the brain** are used in music. "The left brain is involved with general music ability in musicians, perception and production of speech, perception of rhythm and prosody, lyric performance during singing, and the temporal sequences of reading ability. The right brain is involved with processing of musical pitch, control of sound intensity,

identification of musical chords, melody perception in non-musicians, visual pattern recognition, singing, auditory pattern recognition, and expressive rhythmic and melodic behavior” [Institute for Music and Neurologic Function: an affiliate of the Beth Abraham Family of Health Services. Research. www.bethabe.org/Resource_Center97.html Retrieved August 10, 2007].

Wolff’s study found that first grade students who had been given daily music instruction **scored higher on creativity tests** than those who had not been given music lessons [Wolff, K. L. (1992). *The Effects of General Music Education on the Academic Achievement, Perceptual-Motor Development, Creative Thinking, and School Attendance of First-Grade Children*].

Newsweek reported that the part of the brain responsible for **planning, foresight, and coordination** is substantially larger for instrumental musicians than for the general public [(July 24, 2000). Music on the mind. *Newsweek*].