

Music Training and the Brain

Advocates for music education have always sworn that piano lessons pay off. Now an increasing amount of scientific research is indicating that the benefits of music training reach to the brain.

Some studies are suggesting that it boosts brain circuitry and increases certain mental functions. Further insights into how music training affects the brain may lead to new education methods and new ways to treat brain damage.

Recent research in neuroscience suggests that learning to play music positively influences the brain. Scientists hope that ongoing studies will lead to:

- a greater understanding of how the brain can remodel itself,
- fresh ways to use music to help boost learning and
- new ideas on how to use music to treat brain illness.

One line of research finds evidence that music training beefs up brain circuitry. For example, a larger area in the section of the brain that brings music and speech into conscious experience, the auditory cortex, is responsive to piano tones in adult music fans compared with non-musicians.

In addition, certain brain structures also are larger in musicians (see illustration). This suggests that music training can influence brain organisation and ability. In fact, researchers actively are studying whether the brain changes observed in musicians enhance mental functions, including many not associated with music. While research is still in its early stages, some studies already suggest that this might be the case. For example, musically trained adults perform better on word memory tests than other adults.

In addition to adults, children who take music lessons may experience advantages with respect to some cognitive skills. Pre-schoolers who had piano lessons for about six months perform better than other pre-schoolers on puzzle-solving tests. One recent study found that second-graders who took piano lessons and played special computer math games score higher on math tests than children who played the math games but had English language instruction instead of piano lessons.

Maybe you're still debating the benefits of music lessons. Why can't you just listen to your Britney Spears disc for your dose of music education? A few studies suggest that music alone does have a modest brain effect. One study showed that listening to intricate Mozart



Brain imaging research shows that several brain areas are larger in adult musicians than in non-musicians. For example, the primary motor cortex and the cerebellum, which are involved in movement and coordination, are bigger in adult musicians than in people who don't play musical instruments. The area that connects the two sides of the brain, the corpus callosum, is also larger in adult musicians.

Illustration by Lydia Kibiuk, © 2000 Lydia Kibiuk.

tunes temporarily raised college students' spatial skills. In addition, rats exposed to Mozart completed a maze more rapidly and with fewer errors than other rats. On the other hand, some studies report that just listening to music has no effect. Even optimistic researchers say that just listening to music, including Mozart, has a smaller effect than learning to play any kind of music on a musical instrument.

Once researchers fully understand the power of music and music training it may not only help improve healthy brain function, but also might aid malfunctioning brains. One report hints at this possibility. Researchers found that a patient with the brain ailment Alzheimer's disease, improved performance on a task that tested the ability to mentally manipulate objects in space and time after listening to Mozart tunes.

Many scientists hope that future studies will unearth additional benefits.

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