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Music Training And The Brain

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Music Training and The Brain

Advocates for music education have always sworn that piano lessons pay off. Although no one would have denied that music training makes you more well-rounded and may even help you liven up some holiday parties, the extent of its benefit was unclear. 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.

Plink, plink, plink. Ms. Wormwood hovers behind your back. Plink, plink, plink. You could be watching "Judge Judy," playing kickball or even starting that report on otters. Plink, plink, plink. But noooo, you're playing "Fur Elise" by Beethoven for the seventh time. Why, oh why, must you undergo this torture?

There are more answers to this question than you might expect. 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.
- New ideas on how to use music to treat brain illness.

Sure Ms. Wormwood and other music teachers have long suspected that music lessons have far-reaching benefits that might include the mind. But it wasn't until the past decade that researchers began to uncover scientific evidence of an effect.

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 nonmusicians. In addition, certain brain structures also are larger in musicians (see illustration). This suggests that music training can influence brain organization 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.

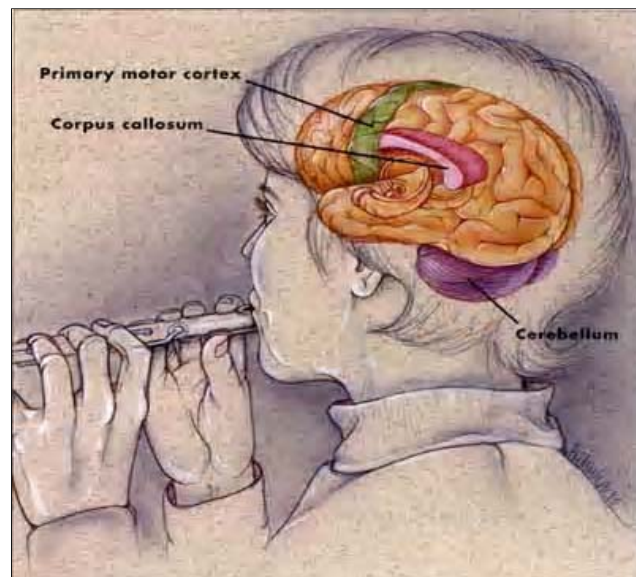
In addition to adults, children who take music lessons may experience advantages with respect to some cognitive skills.

Preschoolers who had piano lessons for about six months perform better than other preschoolers on puzzle-solving tests. Researchers are trying to improve this music effect by adding other training components. 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. Scientists now are testing whether the addition of another set of lessons, which incorporates the computer game into a school's standard math program, will boost the young pianists' math scores even more. Preliminary findings indicate that second-graders who received this version perform as well as fourth-graders in fractions, ratios, symmetry, graphs, and other pre-algebra problems.

Maybe you're still debating the benefits of lessons with Ms. Wormwood. 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 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.



If bigger brain parts mean a bigger intellect, musicians may have a leg up on others. Brain imaging research shows that several brain areas are larger in

adult musicians than in nonmusicians. 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.

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