

# Research finds brain link for words, music ability

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SAN DIEGO – Words and music, such natural partners that it seems obvious they go together. Now science is confirming that those abilities are linked in the brain, a finding that might even lead to better stroke treatments.

Studies have found overlap in the brain's processing of language and instrumental music, and new research suggests that intensive musical therapy may help improve speech in stroke patients, researchers said Saturday at the annual meeting of the American Association for the Advancement of Science.

In addition, researchers said, music education can help children with developmental dyslexia or autism more accurately use speech.

People who have suffered a severe stroke on the left side of the brain and cannot speak can sometimes learn to communicate through singing, Gottfried Schlaug, associate professor of neurology at Harvard Medical School told the meeting.

"Music making is a multisensory experience, activating links to several parts of the brain," Schlaug said.

Schlaug showed a video of one patient who could only make meaningless sounds learning to say "I am thirsty," by singing the words, and another was able to sing "happy birthday."

"If you have someone who is nonverbal and they can say they are hungry or thirsty or ask where the bathroom is, that's an improvement," Schlaug said of the Melodic Intonation Therapy.

As long as a century ago there were reports of stroke victims who couldn't talk but who could sing, he said. Now, they are doing trials to see if music can be used as a therapy.

But, he cautioned, the work is geared toward people who have had a severe stroke on the left side of the brain and the therapy can take a long time.

Nina Kraus, director of the Auditory Neuroscience Laboratory at Northwestern University, reported that new studies show that musical training enhances the brain's ability to do other things.

For example, she said, the trained brain gets better at detecting patterns in sounds, so that musicians are better at picking out the voice of a friend in a noisy restaurant.

"Musical experience improves abilities important in daily life," she said. "Playing an instrument may help youngsters better process speech in noisy classrooms and more accurately interpret the nuances of language that are conveyed by subtle changes in the human voice," Kraus said.

When people first learn to talk and when they talk to babies they often use musical patterns in their speech, she noted.

"People's hearing systems are fine-tuned by the experiences they've had with sound throughout their lives. Music training is not only beneficial for processing music stimuli. We've found that years of music training may also improve how sounds are processed for language and emotion," Kraus said in prepared remarks.

Kraus said "the very responses that are enhanced in musicians are deficient in clinical populations such as children with developmental dyslexia and autism."

New studies of brain waves, she noted, mimic the patterns of sound that the individual hears. Whether speech or instrumental music is heard, it is actually possible to record the brain's electronic waves and play them back to hear the sound — which she demonstrated with a series of recordings.

Aniruddh D. Patel of The Neurosciences Institute in San Diego said new studies show that music doesn't involve just hot spots in the brain, but large swaths on both sides of the brain.

"Nouns and verbs are very different from tones and chords and harmony, but the parts of the brain that process them overlap," he said.

Some scientists, among them Charles Darwin, have speculated that musical ability in humans might have developed before language, Patel said.