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Neuroscientific Research into Music Training for kids, with a focus on at-risk students
By Keith Powers

For musicians, collaboration means hearing cues and responding. Attentive listening makes for good partners, and good partners make good music.

It looks like good listening also means good speaking as well. And reading. And the benefit does not restrict itself to musicians, but to any child who has some consistent musical training.

Dr. Nina Kraus, who heads a team of researchers at the Auditory Neuroscience Laboratory at Northwestern University, has measured the neurological effects of music training with a group of Los Angeles-area children in the Harmony Project, a non-profit that provides free music education to low income families.

Kraus' lab—its work can be viewed at www.brainvolts.northwestern.edu—studies brain function in music and many different other areas, with an aim toward understanding and improving human communication.

Students in the Harmony Project had neural probes attached to their heads, and were measured for speech processing. The study, published in the *Journal of Neuroscience* in September, measured forty-four students in all. About half had participated in after-school music programs for one year, and the rest for two years. The length of participation made a difference.

The probes allowed Kraus' team to measure speech processing with unprecedented precision, she says. The study followed the students, aged six through nine, in their ability to process stop consonants—in this case “b” and “g”—which are a key neural mechanism that is linked to reading and language skills. Students that had been through two years of musical training were consistently more capable of transferring the subtle listening skills from music to speech recognition.

Crucial to the findings were the fact that the benefits of music training only began to appear after the second year. “It’s a mistake to think of music education as a quick fix,” Kraus writes. “If music is an ongoing part of children’s education, it can have a profound impact.”

The study purports to be the first to examine at-risk children. Kraus is hopeful that by providing objective biological evidence showing that music programs improve speech processing, reading and other language skills, community and co-curricular programs will attract increased funding.

Benefits for at-risk children

Dr. Kraus and her team at Northwestern’s Auditory Neuroscience Laboratory have devoted their energies to studying students in community music programs. Kraus works closely with the Harmony Project, a Los Angeles-area non-profit founded in 2001, which offers after-school music lessons to more than 1,400 students.

It’s the benefits to these at-risk students, and the subsequent positive results in combating the achievement gap, that have fueled Kraus’ research. “The neuro signature for poverty was that

children process sounds less precisely,” she says. “When they start learning music, something changes after two years. There was a dosage effect. Children who spent more hours engaged in music classes showed the largest gains.”

As Kraus’ works shows, these programs accomplish more than providing children with enjoyment; the students perform better in school, stay in school longer, and are more likely to participate in post-secondary education.

The results for the Harmony Project are staggering: more than 90 percent of the high school seniors who left that program went to college—in an area where up to half the students typically drop out of school.