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# Grey cells dig music lessons, scans show

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Music lessons can help children as young as 4 show advanced brain development and improve their memory, even when it sounds like a budding musician is banging out little more than noise, a new Canadian study suggests.

Researchers at McMaster University in Hamilton used magnetoencephalography or MEG brain-scanning technology to compare the developmental changes in 12 children aged 4 to 6 over the course of a year.

The study, to be published in next month's edition of Oxford University's neurology journal *Brain*, found that those who took music lessons showed more changes in brain responses.


Even when parents hear only what sounds like random notes or nonsense, it's likely their children are developing their brains in ways that could enhance their overall thinking, said Professor Laurel Trainor, who led the study with Takako Fujioka, a scientist at the Rotman Research Institute in Toronto. Dr. Trainor is director of the auditory lab in the department of psychology, neuroscience and behaviour at McMaster.

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"There are probably really fundamental things going on in the brain as those kids are learning over that first year, so even though they appear on the surface to maybe only play a few pieces, very simple pieces, it's probably setting up networks in their brain," Dr. Trainor said. Music training could lead to improvements in literacy, verbal memory, visiospatial processing, mathematics and IQ, she added.

The study found particular changes in the attentional systems of children who took music lessons, which affected their ability to pay attention to important things around them.

"A child with a superior attentional system will be able to apply that in different domains, so they'll be able to focus in on what's important in a verbal learning task, they'll be able to concentrate when figuring out a mathematical problem," Dr. Trainor said.

"So you can imagine how a superior attentional system would have wide-ranging consequences across many domains." She said the study represents the first time researchers have identified the benefits of music lessons for preschool children.

Previous studies compared the impact of music classes and drama classes in older children and found children who learned an instrument had better improvements in IQ scores.

"I think our study and other studies show that music has benefits . . . for cognitive processing and cognitive development," she said.

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