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# Science

SCIENCE IN MIND

## Learn music, be better at math, right? Study finds it's not so

By Carolyn Y. Johnson | GLOBE STAFF DECEMBER 11, 2013



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**Samuel Mehr, a graduate student at the Harvard Graduate School of Education, and his colleagues tested whether music lessons provided cognitive benefit.**

True or false? Music makes you smarter.

Contrary to popular belief, a study — led by a Harvard graduate student who plays the saxophone, flute, bassoon, oboe, and clarinet — found no cognitive benefits to music lessons.

The finding, published Wednesday in the journal PLOS ONE, is bound to make arts advocates cringe, as it challenges an argument that is often used to bolster the case for music education: it will make kids better at math.

“We don’t teach our children Shakespeare and Dante and Tolstoy because it makes them do better in American history class or at learning the periodic table of the elements,” said Samuel Mehr, a graduate student at the Harvard Graduate School of Education who led the work. “We teach them those great authors because those great authors are important. There’s really no reason to justify music education on any other basis than its intrinsic merits. We have our Dante, Tolstoy, and Shakespeare, and they are Bach, Duke Ellington, and Benjamin Britten.”

The work is part of a trend in the field of psychology in which researchers are beginning to wrestle with studies whose results can’t be reproduced. Last month, an international group of laboratories published the results of an attempt to replicate the findings of 13 experiments. Only 10 of the findings solidly held up.

The idea that learning to play an instrument, read music, or sing in harmony will boost intelligence has become ingrained in modern life, but the evidence has always been pretty scant. Mehr traces the idea that music provides a cognitive boost to an influential paper published in 1993 in the journal Nature, which described a “Mozart effect.” Listening to a Mozart sonata could increase performance on tests of spatial reasoning, the study found.

The effect was short-lived, at least in the scientific world. Listening to Mozart may be beneficial for a slew of reasons, but a number of later studies found that increased intelligence was not one of them. Even as the Mozart effect was debunked scientifically, however, the myth persisted. And the idea that music lessons could make people smarter seemed to go right along with it.

But Mehr and colleagues reviewed the published literature and found just five randomized, controlled trials designed to test whether music lessons could cause people to get smarter. In only one study did they find a clear positive effect of music instruction on intelligence, and in that case, after 36 weeks of piano or voice lessons, the benefit was quite small.

In the new work, Mehr and colleagues in the Harvard psychology department decided to systematically test whether music lessons provided cognitive benefit. They compared music lessons with visual art lessons and tried to eliminate factors that could bias the result. They randomly assigned 4-year-olds and their parents to two different groups, and Mehr taught both classes, which ran 45 minutes and went on for six weeks, to ensure that the difference couldn't be accounted for by a more charismatic teacher.

Instead of intelligence, they looked at a broad suite of tests, including core mathematical abilities, spatial navigation, and linguistic abilities. The study found no evidence of benefit, although it cannot rule out that music might have cognitive benefits, or that perhaps more classes could have an effect.

Ellen Winner, a professor of psychology at Boston College who studies arts education, said the results were not surprising, and the idea that arts education must justify itself because of the benefits it will have in a math class is misguided.

“It suggests a very narrow view of what kids should be learning,” Winner said. “We’ve lost a sense of what it means to be an educated human being. . . . We have to justify the arts on their own terms, as just as important as the sciences.”

*Carolyn Y. Johnson can be reached at [cjohnson@globe.com](mailto:cjohnson@globe.com). Follow her on Twitter [@carolynjohnson](https://twitter.com/carolynjohnson).*

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