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Dyslexic brain may solve some math problems in a roundabout way

Children with the reading disorder rely heavily on right brain to do addition

By [Laura Sanders](#) 11:31am, September 23, 2014



ADDING IT UP Children with dyslexia use their brains differently than other children to do certain kinds of math problems, a study suggests.

The brains of children with dyslexia rely on unusual strategies to solve certain kinds of math problems, researchers [report](#) in the Nov. 1 *NeuroImage*. The findings could explain why dyslexia, a disorder of reading, can bring math troubles too.

By revealing how the dyslexic brain tackles math, the research might eventually lead to better teaching methods, says study coauthor Guinevere Eden of Georgetown University Medical Center in Washington, D.C.

Usually, people use regions on the right side of the brain to solve math problems that require a step-by-step process, such as subtraction and division; regions on the left side of the brain typically handle more rote, fact-retrieval problems such as addition and multiplication.

Eden and her colleagues used functional MRI to assess brain activity in children as they solved math problems. In the brains of children without dyslexia, a region called the supramarginal gyrus on the right side was more active when the kids were subtracting than when they were adding, fMRI scans indicated. But in children with dyslexia, the right supramarginal gyrus was heavily involved in both subtraction and addition. Instead of calling up previously memorized information, children with dyslexia were solving addition problems in a more labor-intensive way, Eden's team suggests.

"The children with dyslexia were clearly engaging the right hemisphere to do addition, even though we really think of that as more of a left hemisphere task," Eden says. "It seems that the brain was using a strategy that is not ideal."

Despite this brain difference, the children with dyslexia scored normally on a math test. "They're well within the normal range in math," Eden says. "And yet it's clear that they have a math problem going on."

Previous studies have found that children with dyslexia are slower and less accurate on multiplication problems than are children without dyslexia. But this study "is the first one to look at the level of the brain," says educational neuroscientist Bert De Smedt of Katholieke Universiteit Leuven in Belgium.

Combined, the research suggests that these children with dyslexia would have scored lower if the math tests were timed or focused exclusively on tasks such as addition and multiplication — situations that favor speedy fact retrieval. "My prediction is that if you put a child with dyslexia under pressure and force them to be very fast, they will run into trouble," De Smedt says.

Historically, some dyslexia researchers have been reluctant to study children with both math and reading trouble, De Smedt says. But the new results may encourage scientists to take a closer look at how math and reading skills interact, a question that might ultimately lead to better ways to boost proficiency in both.

Citations

T.M. Evans et al. The functional anatomy of single-digit arithmetic in children with developmental dyslexia. *NeuroImage*. Vol. 101, Nov. 1, 2014, p. 644. doi: 10.1016/j.neuroimage.2014.07.028.

Further Reading

B. Mole. Faulty brain wiring may contribute to dyslexia. *Science News*. Vol. 185, January 11, 2014, p. 8.

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