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Boys' impulsiveness may result in better math ability, researchers say

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In a University of Missouri study, girls and boys started grade school with different approaches to solving arithmetic problems, with girls favoring a slow and accurate approach and boys a faster but more error prone approach. Girls' approach gave them an early advantage, but by the end of sixth grade boys had surpassed the girls. The MU study found that boys showed more preference for solving arithmetic problems by reciting an answer from memory, whereas girls were more likely to compute the answer by counting. Understanding these results may help teachers and parents guide students better.

"The observed difference in arithmetic accuracy between the sexes may arise from a the willingness to risk being wrong by answering from memory before one is sure of the correct answer," said Drew Bailey, a recent recipient of a Ph.D. in psychological science from MU. "In our study, we found that boys were more likely to call out answers than girls, even though they were less accurate early in school. Over time, though, this practice at remembering answers may have allowed boys to surpass girls in accuracy."

The MU study followed approximately 300 children as they progressed from first to sixth grade. In the first and second grades, the boys' tendency to give an answer quickly led to more answers in total, but also more wrong answers. Girls, on the other hand, were right more often, but responded more slowly and to fewer questions. By sixth grade, the boys were answering more problems and getting more correct.

"Developing mathematical skill may be part 'practice makes perfect' and part 'perfect makes practice,'" Bailey said. "Attempting more answers from memory gives risk-takers more practice, which may eventually lead to improvements in accuracy. It also is possible that children who are skilled at certain strategies are more likely to use them and therefore acquire more practice."

"Parents can give their children an advantage by making them comfortable with numbers and basic math before they start grade school, so that the children will have fewer trepidations about calling out answers," said David Geary, MU professor of psychological science and co-author of the study. "As an adult, it seems easy to remember basic math facts, but in children's brains the networks are still forming. It could be that trying to answer a problem from memory engages those networks and improves them, even if the answers aren't correct at first. In time, the brain develops improved memories and more correct answers result."

The study, "The codevelopment of skill at and preference for use of retrieval-based processes for solving addition problems: Individual and sex differences from first to sixth grades," was published in the *Journal of Experimental Child Psychology*. David Geary is Curators' Professor and a Thomas Jefferson Fellow in the Department of Psychological Sciences in the College of Arts and Science. Drew Bailey will be starting as a post-doctoral fellow at Carnegie Mellon University this fall.

Provided by University of Missouri-Columbia