

Worldwide study finds few gender differences in math abilities

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Girls around the world are not worse at math than boys, even though boys are more confident in their math abilities, and girls from countries where gender equity is more prevalent are more likely to perform better on mathematics assessment tests, according to a new analysis of international research.

"Stereotypes about female inferiority in mathematics are a distinct contrast to the actual scientific data," said Nicole Else-Quest, PhD, a psychology professor at Villanova University, and lead author of the meta-analysis. "These results show that [girls](#) will perform at the same level as the [boys](#) when they are given the right educational tools and have visible female role models excelling in mathematics."

The results are reported in the latest issue of [Psychological Bulletin](#), published by the American Psychological Association. The finding that girls around the world appear to have less confidence in their mathematical abilities could help explain why young girls are less likely than boys to pursue careers in science, technology, engineering and mathematics.

Else-Quest and her fellow researchers examined data from the Trends in International Mathematics and Science Study and the Programme for International Student Assessment, representing 493,495 students ages 14-16 from 69 countries. Both studies' results were released in 2003, and not all countries participated in both assessments. The TIMSS focuses on basic math knowledge, while the PISA test assesses students' ability to

use their math skills in the real world. The researchers felt these two tests offered a good sampling of students' math abilities.

While these measures tested different math abilities, there were only small [gender differences](#) for each, on average. However, from nation to nation, the size of the gender differences varied a great deal.

The two studies also assessed students' level of confidence in their [math abilities](#) and how important they felt it was to do well in math in order to have a successful career. Despite overall similarities in [math skills](#), boys felt significantly more confident in their abilities than girls did and were more motivated to do well.

The researchers also looked at different measures of women's education, political involvement, welfare and income in each country. There was some variability among countries when it came to gender differences in math and how it related to the status and welfare of women. For example, if certain countries had more women in research-related positions, the girls in that country were more likely to do better in math and feel more confident of those skills.

"This meta-analysis shows us that while the quality of instruction and curriculum affects children's learning, so do the value that schools, teachers and families place on girls' learning math. Girls are likely to perform as well as boys when they are encouraged to succeed," said Else-Quest.

More information: "Cross-National Patterns of Gender Differences in Mathematics: A Meta-Analysis," Nicole M. Else-Quest, PhD, Villanova University; Janet Shibley Hyde, PhD, University of Wisconsin-Madison; Marcia C. Linn, PhD, University of California, Berkeley. *Psychological Bulletin*, Vol. 136, No. 1.

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