

# Large study shows females are equal to males in math skills

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(PhysOrg.com) -- The mathematical skills of boys and girls, as well as men and women, are substantially equal, according to a new examination of existing studies in the current online edition of journal *Psychological Bulletin*.

One portion of the new study looked systematically at 242 articles that assessed the math skills of 1,286,350 people, says chief author Janet Hyde, a professor of psychology and women's studies at the University of Wisconsin-Madison.

These studies, all published in English between 1990 and 2007, looked at people from grade school to college and beyond. A second portion of the new study examined the results of several large, long-term scientific studies, including the National Assessment of Educational Progress.

In both cases, Hyde says, the difference between the two sexes was so close as to be meaningless.

Sara Lindberg, now a postdoctoral fellow in women's health at the UW-Madison School of Medicine and Public Health, was the primary author of the meta-analysis in [Psychological Bulletin](#).

The idea that both genders have equal [math abilities](#) is widely accepted among [social scientists](#), Hyde adds, but word has been slow to reach teachers and parents, who can play a negative role by guiding girls away from math-heavy sciences and engineering. "One reason I am still

spending time on this is because parents and teachers continue to hold stereotypes that boys are better in math, and that can have a tremendous impact on individual girls who are told to stay away from engineering or the physical sciences because 'Girls can't do the math.'"

Scientists now know that stereotypes affect performance, Hyde adds. "There is lots of evidence that what we call 'stereotype threat' can hold women back in math. If, before a test, you imply that the women should expect to do a little worse than the men, that hurts performance. It's a self-fulfilling prophecy.

"Parents and teachers give little implicit messages about how good they expect kids to be at different subjects," Hyde adds, "and that powerfully affects their self-concept of their ability. When you are deciding about a major in physics, this can become a huge factor."

Hyde hopes the new results will slow the trend toward single-sex schools, which are sometimes justified on the basis of differential math skills. It may also affect standardized tests, which gained clout with the passage of No Child Left Behind, and tend to emphasize lower-level math skills such as multiplication, Hyde says. "High-stakes testing really needs to include higher-level problem-solving, which tends to be more important in jobs that require [math skills](#). But because many teachers teach to the test, they will not teach higher reasoning unless the tests start to include it."

The new findings reinforce a recent study that ranked gender dead last among nine factors, including parental education, family income, and school effectiveness, in influencing the math performance of 10-year-olds.

Hyde acknowledges that women have made significant advances in technical fields. Half of medical school students are female, as are 48

percent of undergraduate math majors. "If women can't do math, how are they getting these majors?" she asks.

Because progress in physics and engineering is much slower, "we have lots of work to do," Hyde says. "This persistent stereotyping disadvantages girls. My message to parents is that they should have confidence in their daughter's math performance. They need to realize that women can do math just as well as men. These changes will encourage women to pursue occupations that require lots of math."

Provided by University of Wisconsin-Madison

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