

International gender difference in math, reading scores persists regardless of gender equality

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Malala Yousafzai, the teenaged advocate for Pakistani girls' education, was released from the hospital earlier this month. Most of the world's girls don't have to fight as hard as Yousafzai for their education. However, even in countries with high gender equality, sex differences in math and reading scores persisted in the 75 nations examined by a University of Missouri and University of Leeds study. Girls consistently scored higher in reading, while boys got higher scores in math, but these gaps are linked and vary with overall social and economic conditions of the nation. A better understanding of these gaps and how they are related could help educators design curricula to help students of both genders apply their talents and deal with their weaknesses.

"Educational systems could be improved by acknowledging that, in general, boys and [girls](#) are different," said David Geary, MU professor of [psychological science](#). "For example, in trying to close the sex gap in [math](#) scores, the reading gap was left behind. Now, our study has found that the difference between girls' and boys' reading scores was three times larger than the sex difference in [math scores](#). Girls' higher scores in reading could lead to advantages in admissions to certain university programs, such as marketing, journalism or literature, and subsequently careers in those fields. Boys lower reading scores could correlate to problems in any career, since reading is essential in most jobs."

Generally, when conditions are good, the math gap increases and the

reading gap decreases and when conditions are bad the math gap decreases and the reading gap increases. This pattern remained consistent within nations as well as among them, according to the study by Geary and Gijsbert Stoet of the University of Leeds that included testing performance data from 1.5 million 15-year-olds in 75 nations. The top five percent of scores within nations generally showed girls to be lower in math and boys to be lower in reading. That pattern continued in lower scoring groups until reaching the lowest scoring students, where the math achievement of boys and girls evened out but the reading gap increased, according to Geary.

"The consistent pattern within nations suggests the [sex differences](#) are not simply related to socio-economic factors," said Geary. Socio-economic and cultural factors are important in that they influence the performance of all students, but boys, as a group, respond more strongly than girls, perhaps due to a biological difference in sensitivity to wider conditions." For example, in nations with impoverished or violent conditions, boys' scores tended to fall faster and further than girls. On the other hand, in wealthier, socially stable nations boys' scores benefitted more than girls. This resulted in boys reducing the reading gap and widening the math gap.

"This finding has important implications for how we interpret the math gap of other countries," said co-author Gijsbert Stoet of the University of Leeds. "For example, policy makers often take Sweden as an example of being particularly good for reducing the gender gap in science, technology, engineering and math, but they do not realize that Swedish boys fall behind in reading more so than in most other highly developed nations. This is a good example of the inverse relation between the math and reading gaps. This phenomenon urgently needs more attention."

"In adult life, there are more male CEOs, but also more homeless men," said Geary. "Boys' prospects in life seem to react more intensely to

positive and negative social conditions, hence we see more variation in [boys'](#) testing scores, especially when conditions are bad."

More information: The study "Sex differences in mathematics and reading are inversely related: within and across nation assessment of 10 years of PISA data," was published in the journal *PLOS ONE* and can be viewed here: [dx.plos.org/10.1371/journal.pone.0057988](https://doi.org/10.1371/journal.pone.0057988)

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