DIFFERENCES IN FOURTH-GRADE MATHEMATICS AND SCIENCE ACHIEVEMENT BY SEX

Key Findings: Italy, Japan, Russian Federation, United Kingdom (England and Scotland only),[5] United States

In the United States and Scotland, fourth-grade males scored higher, on average, than fourth-grade females in both mathematics and science achievement.

The Trends in International Mathematics and Science Study (TIMSS) assessed fourth- and eighth-grade students in mathematics and science in 2003. This indicator addresses differences by sex in mathematics and science achievement among fourth-grade students in participating G-8 countries.

On the TIMSS 2003 mathematics assessment, fourth-grade males in Italy, Scotland, and the United States outperformed females. In the United States, the difference in performance was 8 points, with males scoring an average of 522 compared with 514 among females (figures 5a and 5b). In Italy, the difference by sex was 9 points (507 for males vs. 498 for females), and in Scotland, the difference by sex was 11 points (496 for males vs. 485 for females). In England, Japan, and the Russian Federation, no measurable differences were detected between the average scale scores of fourth-grade males and females.

On the TIMSS 2003 science assessment, the United States and Scotland were the only G-8 countries where there was a difference by sex in the average scale scores of fourth-graders. In the United States, fourth-grade males scored 5 points higher than fourth-grade females (538 versus 533); in Scotland, males outperformed females by an average of 11 points (508 versus 496). In England, Italy, Japan, and the Russian Federation, no measurable differences by sex were detected in the performance of fourth-grade students.

Definitions and Methodology

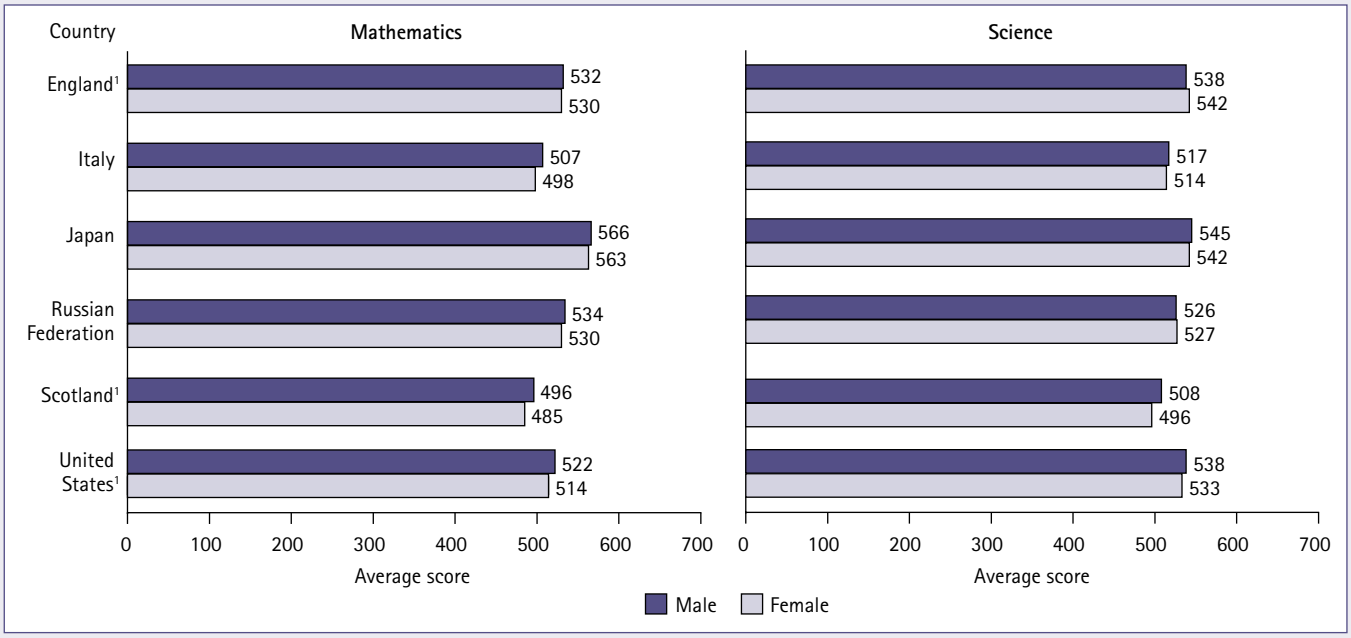
On the 2003 Trends in International Mathematics and Science Study (TIMSS 2003), countries were required to sample students in the upper of the two grades that contained the largest number of 9-year-olds. In the United States and most countries, this corresponds to grade 4.

Since the TIMSS mathematics and science achievement scales were designed to provide reliable measures of student achievement over time, the metric of the scale was established originally with the 1995 assessment. To facilitate the cross country comparison of achievement scores, an international average was calculated whereby all the participating countries contributed equally. The data were then standardized to set the international average at 500, with a range from 0 to 1000 and a standard deviation of 100. Since the individual country means were weighted averages of the student scores, this standardization implied that about two-thirds of the students across all the participating countries scored between 400 and 600.

Male-female score-point differences in mathematics and science achievement presented in the text and in figure 5b are computed from unrounded numbers; therefore, they may differ from computations made using the rounded whole numbers that appear in figure 5a.

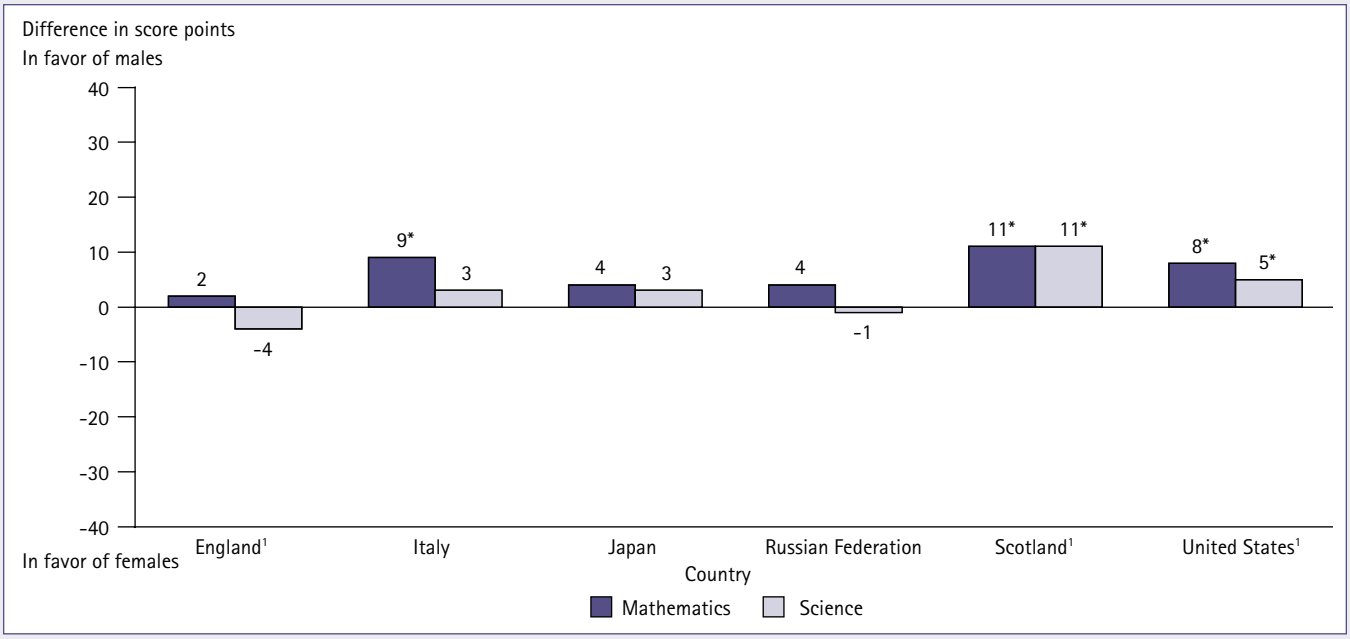
[5]In the data source for this indicator (TIMSS 2003), the United Kingdom is represented separately by two of its component jurisdictions, England and Scotland. Northern Ireland and Wales did not participate in this study.

Figure 5a. Average scale scores of fourth-grade students in mathematics and science, by sex and country: 2003



[1]Met guidelines for sample participation rates only after replacement schools were included. That is, to avoid sample size losses resulting from sampled schools not participating, a mechanism was instituted to identify, a priori, replacement schools that have similar characteristics to the sampled schools that they may replace.
SOURCE: Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., and Chrostowski, S.J. (2004). *TIMSS 2003 International Science Report: Findings From IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades,* exhibit 1.4. Chestnut Hill, MA: Boston College; and Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., and Chrostowski, S.J. (2004). *TIMSS 2003 International Mathematics Report: Findings From IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades,* exhibit 1.4. Chestnut Hill, MA: Boston College.

Figure 5b. Difference in average scale scores between fourth-grade males and females in mathematics and science, by country: 2003



*p < .05 (difference in score points is statistically significant).
[1]Met guidelines for sample participation rates only after replacement schools were included. That is, to avoid sample size losses resulting from sampled schools not participating, a mechanism was instituted to identify, a priori, replacement schools that have similar characteristics to the sampled schools that they may replace.
NOTE: Differences shown are computed by subtracting the average unrounded score for females from the average unrounded score for males. Thus, positive values indicate higher average scores for males.
SOURCE: Martin, M.O., Mullis, I.V.S., Gonzalez, E.J., and Chrostowski, S.J. (2004). *TIMSS 2003 International Science Report: Findings From IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades,* exhibit 1.4. Chestnut Hill, MA: Boston College; and Mullis, I.V.S., Martin, M.O., Gonzalez, E.J., and Chrostowski, S.J. (2004). *TIMSS 2003 International Mathematics Report: Findings From IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grades,* exhibit 1.4. Chestnut Hill, MA: Boston College.