

A LINE ON LIFE

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Gender Differences in Math *

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In most introductory psychology texts, it is stated that boys score higher than girls on math. Why does this difference exist?

It seems to have started with boys scoring higher on the math section of the SAT (Scholastic Aptitude Test). Since math abilities are needed for most sciences, this leads many to assume that would not be as effective in science either. Some experts thought that this math difference was caused biologically or genetically. In other words, males were better in math, because they had a genetic predisposition or brain organization that allowed them to excel in that area. These conclusions received widespread attention from the popular media.

However, there is little, if any, scientific data to support this biological explanation. In contrast, another explanation emphasizes **gender bias**. Some psychological studies have indicated a bias in SAT (and other standardized exams) that gives males an advantage. Even with this, gender differences have been small. Since the mid-1970s, these small differences have been decreasing.

Many psychologists view gender bias as a *social* phenomenon. This relates to at least three factors.

Subject Bias

When discussing science, outside of Marie Curie, women are rarely or never mentioned. (Can you recall any other women being mentioned in your science courses?) Only in the last five years have introductory psychology texts even mentioned some of the outstanding contributions of women in the field. Recent psychological studies have indicated that math problems are typically biased toward masculine interests.



Computer skills are very helpful in science and math. In some schools, children are introduced to computer use. However, computer software – especially computer games – are more often oriented toward masculine areas. Even computer games in math and science revolve around masculine themes – violence and adventure. With these trends, girls are more likely to view computers as masculine. This may not only effect their interest in computers but also in careers that require proficiency with computers.

Even if girls become proficient with computers, they pay a price. A 1990 study indicated that adolescent girls who excelled in computer skills faced obstacles. The girls reported *"the boys being 'jealous' of [the girls'] knowledge of electronics and of 'hassling' the girls in class."* The boys admitted that this was true. The study quoted one girl who was pursuing a career in computer science, *"It's usually the brave that do it."*

The difference doesn't seem to be in the math ability itself. With identical math backgrounds, girls and boys show little difference in math tests. It seems that – beyond graduation requirements – girls are less likely to seek math training.

Teacher-Student Interactions

The interactions of students with teachers seem to affect the proportion of girls who pursue math beyond graduation requirements. For example, only 10% of the boys are discouraged from math courses by teachers. However, 33% of girls have received similar discouragement from their teachers. (This difference is much larger than the gender differences indicated by the math section of the SAT.) Teachers reinforce boys more than girls for math proficiency. Many teachers convey the idea that math is more important for boys than girls. Teachers are more likely to call on boys than girls to solve math problems in class.

Parental Encouragement

Another factor that influences proficiency in any area is parental encouragement. Few parents directly discourage their girls from studying math. However, many parents *indirectly* discourage math for girls. Parents are much more likely to enroll sons than daughters in computer camps. The gender difference is even greater when the costs of these camps is high. Similarly, boys are more likely to have access to personal computers in the home. Essentially, it seems that parents provide more support for boys than girls for excelling in math and science.

**Although gender differences may be significant,
the overlap of abilities in both groups is much greater.**

Even though there may be a small innate difference in math potential, boys and girls are more similar in all abilities. It seems that **social factors** – culture, teacher and parental treatment – can modify these differences. Currently, social factors are designed to make the gender differences greater. It is very much like a **self-fulfilling prophecy**. If we believe in gender differences, we will behave in ways that encourage these differences.

The solution to this problem seems obvious. If we encourage excellence in any field equally for both boys and girls, many areas will become less sex-segregated. If we do not, math will remain a "*critical filter*" that will block many women from advancing to lucrative and prestigious scientific professions.

* Adapted from Claire Renzetti and Daniel Curran, *Women, Men and Society*, Allyn and Bacon, 1995, pages 125-126.