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Women in Mathematics: Scarce or Many?

—By Cathy Kessel, President, Association for Women in Mathematics

A common belief is that there are few — or even no — women in mathematics and related fields. Some statistics reinforce this view, and some counter it. For example:

• Women take 10 percent of the Advanced Placement tests in Computer Science AB, but 50 percent of the tests in Statistics.

• Women earn 18 percent of PhDs in physics, but 46 percent of PhDs in biological sciences.

• Women comprise 18 percent of network and systems administrators, but 62 percent of accountants and auditors.

Mathematics itself is somewhere in between. Women now earn 48 percent of undergraduate degrees in mathematics, up from 40 percent in the 1970s. About 30 percent of the PhDs in mathematics go to women — three times the proportion of the 1970s.

These percentages are reflected in university mathematics departments. A recent survey found that, in PhD-granting mathematics departments, women were 22 percent of the tenure-eligible faculty; that is, they were 22 percent of those who could eventually become full professors.

So, women are a presence in mathematics, but it appears that — like many other professional women — they have also bumped their heads on a glass ceiling.

It's been over 10 years and 28 hires since the mathematics department at UC Berkeley hired a woman as a tenure-eligible or tenured faculty member — with one exception. A woman was hired with a joint appointment in physics and mathematics (the order indicates evaluation for tenure by the physics department). Currently, four of the Berkeley mathematics department's 45 full professors are women.

While the Harvard mathematics department grants PhDs to women and hires them for temporary positions, it has never hired a woman for a tenured or tenure-eligible position.

Is this due to lack of "innate ability?" Despite opinions expressed in the media, the scientific jury is out and may be out for a long time to come. Recent psychological findings are summarized in "Why Aren't There More Women in Science?," a collection of essays released last November. The biggest surprise for its editors was essays about biological differences: "Some arguing strongly in favor of sex differences in brain organization, hormones, etc., as causative factors in women's underrepresentation among those who score the highest on standardized mathematics tests, and others arguing against such views."

In contrast to the lack of consensus about biological factors, there are consistent findings of

“unconscious bias” in the evaluation of males and females in a variety of contexts. For example, orchestras hired more women musicians when auditions were conducted from behind a screen. Resumes were ranked differently by different psychology department chairs, depending on whether name of “applicants” were male or female. When authors’ names were removed from articles submitted to an academic journal, there was a 100 percent increase in published articles with female authors.

Such findings are discussed by the psychologist Virginia Valian in her book Why So Slow?: The Advancement of Women. It goes a long way in explaining why women are scarce in the top ranks of mathematics — and of society in general.
For more information, see the Association for Women in Mathematics website, .
