

Representation of women in physics is increasing but still lags behind other fields. A new study assesses the participation of women in physics over time and around the world. The evidence supports the idea that societal attitudes and support for women play a major role in the gender disparity rather than any innate difference between men and women.

Women’s progress in the face of challenges

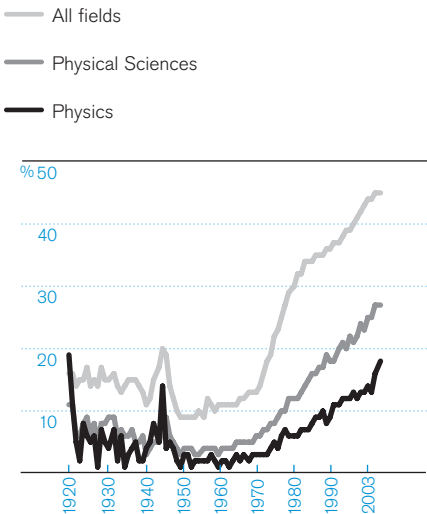
In early 2005, media attention focused on the remarks of Harvard President Lawrence Summers, and on his speculation that there are gender differences in “innate aptitude” causing women’s lower representation in science and engineering. Summers dismissed the possibility that discrimination and socialization contribute to the problem. However, in making these speculations, he overlooked evidence from multiple data sources and from scientific studies, all of which support the conclusion that social and historical contexts contribute heavily to the situation of women in science.

For example, we can see that the representation of women in physics has increased a great deal in the past 30 years (Figure 1). In the early 1970s, less than 5% of physics PhDs were earned by women. In 2003, 18% of physics PhDs were earned by women, a record high. This

increase is unlikely to be caused by a sudden change in women’s innate aptitude for math and science. Rather, this change is the result of many factors, including a change in societal attitudes and support for women in physics. Many women and men in the physics community have put in decades of work mentoring young women, focusing attention on the chilly climate of physics departments, and working to correct this environment. There is no doubt that their efforts have paid off, as evidenced by the increasing percentages of women in physics at all levels, from bachelor’s degrees up through faculty positions.

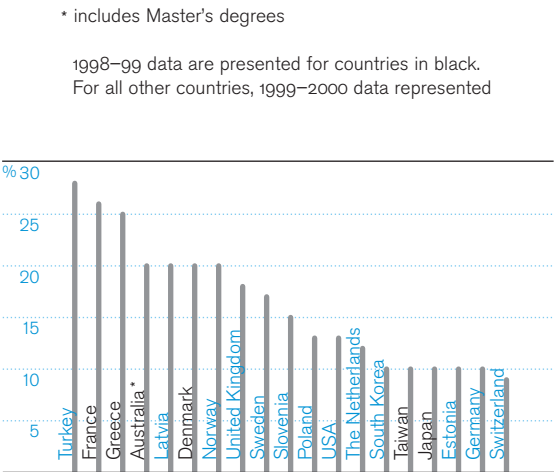
Not only has the representation of women in physics changed recently, it has changed over the past century in a most surprising way. Before World War II, the percentages of PhDs earned by women were higher than during the 1950s and 1960s. After the war, our society emphasized domesticity for women, and jobs and education for male veterans. Women who had worked at

Figure 1: Percent of PhDs awarded to women in selected fields, 1920–2003



Sources: National Research Council, National Opinion Research Center, and National Science Foundation.

Figure 2: Percent of physics PhDs awarded to women in selected countries: 2 year averages



* includes Master's degrees
1998–99 data are presented for countries in black.
For all other countries, 1999–2000 data represented

Data compiled by AIP Statistical Research Center to include countries that provided data from reliable statistical agencies.

wartime manufacturing jobs were laid off and told to return home because their job would go to some deserving male veteran. Coupled with the GI bill, this emphasis on homemaking for women and jobs for men had an effect on women's participation in higher education. Women's representation among PhD recipients was lower post-war than it had been pre-war, not only in physics, but in all fields. It was not until the late 1970s that women's participation in higher education at the PhD level began to increase, and it has done so rapidly.

Further evidence for the cultural context of science can be found in examining the variability of women's representation in physics across countries (Figure 2). The effects of different cultural environments and different levels of support for working women are most evident when we compare the representation of women in physics in France to their representation in Germany. In France, where two-earner families enjoy state-supported child care, more than one quarter of physics PhDs are earned by women. In Germany, where this support is absent, just 10% of physics PhDs are earned by women. While the child care difference is not solely responsible for the difference in physics degrees earned by women, it does illustrate the importance of societal support for women in science.

Data from the United States indicate that once women have earned a bachelor's degree

in physics, they are able to advance through the academic ranks at about the same rate as men. For example, retention rates during physics graduate school are about the same for US women and men. Women are represented on physics faculties at the rates we would expect given degree production in the past. However, these data do not support Summers' assertion that there is no discrimination against women in science. Nor do they mean that we should conclude things are as they should be for women in physics. These data do not tell the complete story because they do not describe the personal experiences of women who have dropped out or, alternatively, persisted in physics despite a very chilly, if not sometimes hostile, climate. Instead, these data point to the perseverance and determination of women in physics and to the efforts of those who have dedicated themselves to correcting the situation of women in physics.

Rachel Ivie

Rachel Ivie is Principal Research Associate in the American Institute of Physics' Statistical Research Center. The report Women in Physics and Astronomy, 2005 containing the data discussed here and the source of the charts is available at <http://www.aip.org/statistics/trends/gendertrends.html>

Photo: Peter Ginter



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