

Opinion | Women win a fraction of scientific Nobels. Marie Curie offers fixes.

The missing elements? Mentorship, encouragement and child-care support for aspiring women scientists.

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By Dava Sobel

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In the century-plus history of the Nobel Prizes, women have received only 13 awards in physics and chemistry. But, while gender equity in science is far from solved, things are looking up: More than half of those women won within the past six years. How can this trend be continued? Marie Curie’s life offers some ideas.

The only person to receive a Nobel Prize in both physics and chemistry, Curie faced a forbidding all-male scientific establishment but benefited from an exemplary network of support that most women scientists lack today.

Her family encouraged her, especially her father, who awakened her interest in science. He believed she deserved an education — even though in Warsaw, where Marie was born in 1867, her sex barred her from university admission. She and an older sister, Bronya, made a pact: Marie would work as a governess to support Bronya’s medical studies at the University of Paris until Bronya became a doctor and could return the favor.

[A report by the American Association of University Women](#) on girls’ performance in math and science classes affirms that the attitudes of parents and teachers are essential to success. Merely telling high school-age girls that their “intelligence can expand with experience and learning” was enough, in one study, to raise their grades and make them more likely to want to continue studying math.

At the University of Paris, then-Marie Sklodowska earned two master’s degrees before meeting physicist Pierre Curie, whom she married in 1895. He helped her devise the apparatus for her doctoral research, and later, when her results got really interesting, he dropped his own experiments to work with her in the field she named “radioactivity.” Not only could Marie rely on Pierre’s constancy as husband and lab partner, but also on the aid of his widowed father, who moved in with them to help care for their daughter Irène.

In the United States, that level of support can be hard to come by and [more than 40 percent](#) of female scientists leave their full-time positions after the arrival of their first child.

Marie gave birth to a second daughter, Ève, in 1904, and returned to the laboratory, as well as to teaching physics a few days a week at an academy for female teachers. Aside from her father-in-law and the extra hired help she could now afford, she employed her pet pupil, Eugénie Feytis, as a frequent babysitter. This student benefited, too, learning from Curie as a role model. She undertook her own doctoral research in physics, married a fellow physicist and later became director of the teaching academy.

Role models matter, and [research shows](#) that a role model need not be physically present in a young girl’s life to inspire her. In fact, this study even identified Marie Curie as a figure fulfilling that role for many.

After Pierre died suddenly in an accident in 1906, the grieving Marie was invited — against the all-male traditions of the University of Paris — to take over the university laboratory where they had worked together. She also assumed his professorship. As the first woman ever to teach at that ancient institution, she rankled some colleagues but enjoyed the collegiality of others. A few fellow professors and their wives joined her in the formation of a cooperative school for their children, which Marie tailored to the instructional needs of the adolescent Irène.

Modern women faculty members are as likely to be rebuffed by their female deans and professors as by men in those positions. Instead of helping a younger newcomer, women in senior roles might be inclined to let a newcomer flounder alone, as they had to do.

Marie's fame as the first female Nobel Prize winner made her a beacon. Dozens of aspiring female scientists trekked to Paris to work or study under her. Several returned home to become, in their turn, the first tenured female professors in the Netherlands, Hungary, Portugal and elsewhere. During World War I, as she scrambled to provide X-ray services for wounded soldiers, Marie trained 150 willing French women to operate the equipment and interpret the images. At the same time, her daughter Irène, still a teenager, took a nursing degree on top of her academic studies and served in hospitals near the front.

Irène affirmed her mother's values by following Marie into the lab. She earned her own Sorbonne doctorate, married, raised two children and conducted the research that made her, in 1935, the second woman to win the Nobel Prize in chemistry.

Encouragement, mentoring and affordable child care are probably the least expensive elements associated with research in physics or chemistry, yet they are critical to the success of women scientists today. In her era, Marie was the exception from the norm. Today, she still has advice for a more equitable future.
