

# What Does a Mathematician Look Like?

The stereotype of an American mathematician is someone who solved the Rubik's cube at eight, took calculus at fourteen, and was tackling serious mathematics at sixteen. And he's a guy.

We all know people like this. But most of us don't fit the stereotype. We came to mathematics by different paths. We needed time to think about our lives, ourselves, and that stereotype. And some of us are women.

G. H. Hardy famously wrote "Mathematics is a young man's game." American culture is a youth culture. The culture of mathematics celebrates youth and precocity. But the idea that for mathematics one has to start early, that mathematicians get old fast, and that if you're over thirty you've missed the boat, is a myth. Most mathematicians, if they produce after writing their dissertations, continue to produce throughout their professional lives. And most mathematicians were not prodigies.

For women this is especially true. For an extreme example consider Alice Roth, whose fruitful and important career had to wait until she retired from high school teaching ("Alice in Switzerland: The Life and Mathematics of Alice Roth", by U. Daepf, P. Gorkin, P. Gauthier, G. Schmieder, *Mathematical Intelligencer*, vol. 27, no. 1, 2005). Consider also Harriet Moser, who completed her doctorate at sixty-four ("An Interview with Harriet Moser", Joan Birman, *Newsletter of the Association for Women in Mathematics*, March-April, 2005). There are many others who chose math only late in their college careers or after. Women often take longer than men to discover their love for mathematics and still go on to become fine mathematicians.

American society tells women that they aren't mathematicians. Nearly 60 percent of college undergraduates are women, but only 16 percent of tenured mathematics faculty members are women. In hundreds of subtle ways, girls are told they shouldn't expect to excel in mathematics. It's not surprising, therefore, that they don't. But the culture doesn't have to be that way. It's not that way in every country—in the Philippines, for example, half the mathematics Ph.D.'s and more than half the tenured mathematics faculty are women.

The impact of culture on performance is addressed in the pioneering work of Claude Steele. In a series of experiments, Steele and his students detailed the power of expectations and culture on women and minorities. They have shown in repeated studies, for example, the achievement of women on mathematics tests can be significantly better when no men are around. See "Stereotype threat and women's math performance", by S. J. Spencer,

C. M. Steele, and D. M. Quinn, *Journal of Experimental Social Psychology*, 35, 4-28; and "A Threat in the Air: How Stereotypes Shape Intellectual Identity and Performance", by Claude Steele, *The American Psychologist* 52, pp. 613-629.

Our educational apparatus works well for those who fit the stereotype. It works less well for others. In particular, many women face a double hurdle. They are discouraged early by society's expectations for women. Then after a few years, when they have found themselves and their love of mathematics, they are discouraged by society's expectations for older students.

There are outstanding programs for women who are on track. The EDGE program and the Carleton and George Washington summer programs for women in mathematics offer such students courses, confidence, and community. What is needed is a program for women who are off the track. What is needed is a program that will give talented women with energy and drive a chance to get back in the game. Smith College will start such a program this fall.

The Center for Women in Mathematics at Smith College is offering the nation's first post-baccalaureate program in mathematics. It is for women who have graduated without majoring in mathematics or women whose backgrounds are otherwise not sufficient for graduate school. It's a place for these women to take courses, to build skills, and to gain confidence before moving on to graduate study in mathematics. It is, in fact, an alternative culture, a vertically integrated community of women: undergraduates, BAs, graduate students, Smith alumnae mathematicians, and both female and male Smith mathematics faculty.

Yes, we marvel at the prodigies whose unwavering interest and aptitude in mathematics are evident from the start. But we must also open our minds to the vast numbers of students—women and minorities (and others from all walks of life)—who can be mathematicians but may not make that choice until late in their college careers or after.

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