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**Correction:** Because of an editing error, scholar, author and feminist Sheila Tobias' relationship to the University of Arizona was incorrect in a front-page article Tuesday. Tobias is not employed by UA. (Corrected by deleting UA's in subtitle. mwatt)

## **Gender gap in math, science? Not for her Tobias seeks classroom, workplace equity**

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The gender gap in math and science studies is narrowing as thousands of girls settle into classrooms where equations and Petri dishes outnumber sonnets and art easels.

Much of the movement is credited to the pioneering work of a Tucsonan who is neither mathematician nor scientist.

Sheila Tobias has spent her career raising awareness that math and science are no more attached to the Y chromosome than baking is attached to the X chromosome.

Tobias, 72, has worked for three decades persuading scientists, mathematicians and university officials to accept initiatives aimed at helping women gain equity in science, technology, engineering and mathematics.

In doing so, she has gained a national reputation as a leading feminist, activist and scholar.

Honoring her work, the Association for Women in Science last month named Tobias to its executive board for a three-year term beginning in January, an unusual move because she is not a scientist.

To create more opportunities for women, Tobias almost single-handedly persuaded the University of Arizona to launch its Professional Science Master's programs. Touted as an MBA for scientists, it has since spread to more than 50 universities nationwide.

Tobias' examination of women's issues through the lens of math and science led to her appointment this summer to the strategic advisory board for the ADVANCE program at UA, a \$3.3 million National Science Foundation-funded initiative aimed at increasing the participation of women in science and engineering careers.

"We asked her to serve because of her long-term, sustained interest and impact on improving the status of women in science," said Beth Mitchneck, associate dean for academic affairs in UA's College of Social and Behavioral Sciences.

"She was a true trailblazer in dealing with issues of gender inequity in science before it was fashionable."

It was unusual for the nation's largest multidiscipline scientific organization for women to elect a non-scientist, but Association for Women in Science executive director Janet Bandows Koster said she is "absolutely thrilled" Tobias is joining the board.

"She is such a pioneer in gender issues in the (science, technology, engineering and mathematics) fields," Koster said, "and as a women's organization that is also a science organization, we stand at the very nexus between the two, so she is perfect."

It all started with a 1976 article by Tobias in Ms. magazine titled "Math Anxiety."

"It was one of the most important and powerful pieces we've ever published," said Gloria Steinem, publisher of Ms. "She described for the first time that there is no more a math mind than there is a history mind. It is just that people learn in different ways."

That article led to Tobias' bestselling book, "Overcoming Math Anxiety," and a career focused on framing math and science education as a feminist issue.

"Sheila is that most precious of people," Steinem said. "She's someone who can be the bridge between expertise and the average citizen. She is an extremely good mind, a good writer and analyst, and she can phrase expert knowledge in a way that is accessible to everyone and therefore helps everyone understand that expert knowledge is accessible."

Reared in New York by parents who were first-generation American immigrants, Tobias was "interested in everything" as a child and viewed math as fun because her father challenged her to math-solving contests.

"I was never afraid of math," she said. "I had what I call 'math mental health,' which is the ability to learn the math you need when you need it."

That skill came into play when Tobias was an associate provost at Wesleyan University, where she helped develop one of the nation's first women's studies programs, from 1970 to 1978.

"I'd be handed a packet with lots of statistics, and I realize I needed help understanding it. So I would find someone who could help me understand it," she recalled. "My opening line when I called people was, 'I'm buying lunch,' and they would say, 'What do you need?' That's math mental health - learning math when you need it from people who know it."

But Tobias noticed that many people - especially women - "shut down" when confronted with math-heavy material. She started examining why, and her research and observations during those years led to the Ms. article and, shortly thereafter, the establishment of math-anxiety clinics at college campuses nationwide. In short order, Tobias became known as the person in the "second wave" of feminism who would investigate women's equity in the fields of math and science.

"The feminist movement was like an army, where everyone got assignments," Tobias explained. "I was studying fields where men dominated - mathematics, physical sciences, the military/industrial complex - and looking at women's access."

Tobias moved to Tucson in 1981 to help write "What Kinds of Guns are They Buying for Your Butter?" with former state Sen. Peter Goudinoff.

"Tucson was, for me, an extremely welcoming place to settle because of the strength of the women's movement here," she said.

To Tobias, the fact that women are just as competent as men in math and science is a no-brainer.

"Underrepresentation in those fields is due to social and political prejudice, but in no way is rooted in brain differences," she said. "We find women dropping out on the way up, and I want us to build an analytical framework for moving women forward. . . . We need to accommodate lifestyle difference and needs, but we don't have to change science and math."

Accommodating those needs is what led Tobias, who calls herself a "science groupie," to come up with the idea of mixing science with business in a professional degree, which resulted in the Professional Science Master's.

"I'm always the guy from Mars," Tobias said. "If someone from Mars were to look at how we distribute the work people can do in science, it would look like a very limited view. Why do students of science and math only have two or three tracks they can take with that degree? And the answer is that it fits a male lifestyle - engineering, teaching science, research. I asked, 'Why can't we have another track to drive scientists into business?'"

It was that argument that convinced UA, said Alaina G. Levine, who oversees the Professional Science Master's programs as director of special projects for the UA College of Science.

The university has graduated more than 50 students with PSM degrees since 2000, when it became one of five universities nationally to launch the program with a \$300,000 Alfred P. Sloan Foundation grant.

"There's no doubt this whole PSM movement would not have happened if not for Sheila's energy and passion to help scientists find their own path," Levine said. "I don't think the UA would have this program without her. . . . Why should somebody who loves science and math have to abandoned it if they don't want to get a Ph.D.? You don't lose the best and the brightest if you offer another option. They are still working, pumping out innovation. It may not be in an academic environment, but the value is still there."

Megan Lehrkamp, a 2005 graduate of UA's PSM program, agreed. She manages a product development group at Ventana Medical Systems, 1910 Innovation Park Drive.

"What this degree does is help people see you can be successful as a scientist without a Ph.D.," Lehrkamp said. "I think Sheila's someone who thinks outside the box, and I don't think these programs would exist without her. Maybe other people were thinking about it, but she's the one that took action."

#### ABOUT SHEILA TOBIAS

Sheila Tobias's vita reads like a prescription for the overachiever. She received her bachelor's degree in the history and literature of Europe from Harvard-Radcliffe College, her master's in European history and politics from Columbia University, and has received eight honorary doctorates.

She co-founded the nation's first large-scale women's studies lecture course at Cornell University in 1970.

She was an associate provost at Wesleyan University from 1970 to 1978, during which she initiated a math-anxiety program and wrote "Overcoming Math Anxiety," which was reissued in 1995 and has been a bestseller.

In 1989, funded by Tucson's Research Corp., Tobias began a seven-year research and writing project to understand college students' reluctance to major in the sciences. Three books resulted, one of which was "Rethinking Science as a Career," which was the genesis behind the Professional Science Master's programs funded by the Alfred P. Sloan Foundation.

She has taught women's studies and peace studies at a variety of universities, including UA, the University of San Diego and the University of California-Davis. She has written nine books and numerous magazine and journal articles.

Tobias is married to Carl Tomizuka, a retired UA physicist. She is co-president of Veteran Feminists of America, a national group honoring and celebrating feminists who were involved in the "second wave" of feminist activism between 1963 and 1975.

**Caption:** Sheila Tobias, an author and self-proclaimed feminist, has spent decades trying to persuade university officials to accept initiatives aimed at helping women gain equity in science, technology, engineering and mathematics. Tobias moved to Tucson in 1981 to help write "What Kinds of Guns are They Buying for Your Butter?" with former state Sen. Peter Goudinoff.

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