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TV's Next Big Star: a Female MacGyver



Courtesy of Judith Weis

In the early 1970s, Judith Weis, a marine biologist at Rutgers U., discussed her research as part of a television commercial for Tang. The advertisement inspired at least one girl to pursue a career in science. Now another effort is underway to use positive female role models to expand the ranks of women in science.

pharmaceutical company Merck, in Pennsylvania.

By *Meg Bernhard* | JULY 24, 2015

□ PREMIUM

Madelyn Caltabiano became a scientist in part because of a Tang commercial. She had been interested in science for as long as she could remember, but when she was a teenager, in the early 1970s, a TV ad for the orange-flavored drink convinced her that she could dedicate her life to that work.

In the commercial, a female marine biologist from Rutgers University stood on a beach, holding a crab and talking about her research, as her young children stood nearby. Ms. Caltabiano says that the commercial, and others in a series by the company, showed her — for the first time in her life — examples of women who had forged successful careers in science. After watching them, she says, "I had no reason to believe I couldn't do it as well." Today she is a senior vice president at the

Television can play a powerful role in shaping the career paths and goals of young people. Children and teenagers can find role models on the screen if they don't have any in their own lives. But television shows rarely feature women in science and engineering. Even when female scientists do appear in a popular show, they are often depicted stereotypically or unrealistically: too beautiful, too ditzy, the sidelined wife of a more prominent scientist.

The University of Southern California's school of engineering wants to do something different. Along with the National Academy of Engineering and a number of Hollywood partners, the school is hosting a competition, called "The Next MacGyver," to create a television show whose protagonist is a female engineer.

"The goal is to inspire and change the culture" — a culture that dissuades young women from pursuing degrees in the hard sciences, says Yannis C. Yortsos, dean of USC's engineering school.

Scholars, administrators, and even politicians often deplore the leaky pipeline for women in science, engineering, technology, and mathematics, the STEM fields. Just look at the numbers: In 2013 women received only 42 percent of all science and engineering Ph.D.s, according to data from the National Science Foundation. What's more, they accounted for less than 30 percent of all Ph.D.s in the physical sciences and engineering.

The problems start when girls are young. First, they often aren't exposed to STEM subjects early on. Nor are they generally encouraged to take part in what are often seen as male-dominated activities, like robotics or science clubs. And the dearth of female scientists on television means that young girls are left with only a few images of scientists — often, a "geeky" white male, Mr. Yortsos says.

If the USC competition works as Mr. Yortsos intends, a new television show starring a credible female scientist solving problems and inspiring young girls will air on some popular network in the near future. That show could star an engineer who builds spy gadgets, or an FBI field agent from the future, should either of those concepts — two of the finalists — win.

But the storyline and characters' personalities must be crafted carefully, observers say, or the show could be counterproductive. There's a fine line between providing young girls a role model and adding to the stereotypes of female scientists that dominate today.

The Character/Career Correlation

Over the past decade, a number of researchers have noted the effects of the media on young people's career goals and identification. Scientists talk casually of a possible relationship between the advent of *Grey's Anatomy*, the popular medical drama, in 2005 and a rise in medical-school applications around that time. They postulate that the series made the image of a doctor more accessible — and more appealing — to young people.

For young girls, the depiction of female scientists in the media can be especially powerful. In one paper, Jocelyn Steinke, a professor at Western Michigan University who studies images of science and scientists in the mass media, emphasizes that depictions in film and on television can influence young girls' perceptions of women and "their visions of who they can become in the future." Television and film can be particularly important for girls who don't personally know any female scientists.

A recent study published by a USC researcher, Stacy L. Smith, noted that only 21 percent of characters in STEM careers on prime-time television were women. Similarly, only 16 percent of people with STEM careers featured in family films were women.

And the female scientists and engineers who are featured in popular culture tend to exhibit unrealistic or exaggerated characteristics, with too much emphasis on appearance and attractiveness, says Heather Metcalf, director of research and analysis at the Association for Women in Science.

Additionally, female scientists tend to be represented "as a mother or a cook or a caregiver, a wife, in that kind of stereotypical gender role," she adds. And in one recent incident, made viral by the hashtag #DistractinglySexy, the Nobel laureate and biochemist Richard T. (Tim) Hunt spoke of the "trouble with girls" in his lab: "You fall in love with them, they fall in love with you, and when you criticize them they cry."

Some people, like Sapna Cheryan, an associate professor of psychology at the University of Washington, argue that television shows also play into larger stereotypes in STEM fields. *The Big Bang Theory*, a sitcom on CBS, prominently features two female scientists. But both of them work in biology, a field that women now dominate. The male scientists in the show, on the other hand, work as physicists or engineers.

Though Ms. Cheryan, who has studied popular stereotypes of computer scientists, acknowledges that the comedy is meant to exaggerate the characteristics of scientists, she says it is "not pushing the envelope" in its depiction of female scientists.

Finalists to Make Their Pitches

Mr. Yortsos, of USC, is optimistic that his university's competition, which received more than 2,000 submissions, can make women in STEM more visible.

Nao Murakami, a Ph.D. candidate in aeronautics and astronautics at the University of Washington, is one of the competition's 12 finalists who will pitch their ideas to a panel of judges — including Hollywood producers and scientists — next week in Los Angeles.

Her concept, tentatively called "The Mind," centers on a large database that stores the minds and memories of deceased scientists, like Albert Einstein. The main character, an engineer named Lucy, will solve cases in each new show using information from the database.

Ms. Murakami hopes to present a realistic image of a female engineer, one who isn't a "really tall and skinny supermodel kind of character" but also not a genius. Her protagonist is "normal," Ms. Murakami says.

Her plan points to the many ways this kind of television show could go wrong. The show's producers will have to be meticulous in determining what the character looks like, how she speaks, and how she acts. Other observers wish that instead of just one female protagonist, the show could feature several, to represent the diversity of experiences women have in science — including those of minority women.

For his part, Mr. Yortsos worries that if the show doesn't gain a large viewership, that might indicate that the topic simply does not grab people's attention.

And simply adding more female-scientist characters to television shows can't solve all the problems women face in STEM fields. There are still unconscious biases in the hiring process and "larger cultural problems" that may force women out of their departments or fields, says Ms. Metcalf. "Having a female protagonist in a show isn't necessarily going to fix the issue of women's underrepresentation," she says.

For Alice Hogan, who was director of a National Science Foundation program to increase women's representation in the sciences, change can be slow, since a show must change the "hearts and minds" of individual viewers.

But using television to showcase women in STEM has shown promise in the past, as Ms. Caltabiano can attest.

In 2009 she decided to track down the scientist who starred in that old Tang commercial, Judith Weis, and sent her a note of appreciation: "Thank you — for deciding to make the commercial and become a positive role model for not only for me but hopefully many other women," Ms. Caltabiano wrote. She added that she obtained her Ph.D. in pathology in 1987, and that her own daughter was pursuing a career in engineering.

"I was just glad to hear that," says Ms. Weis, remembering the message and a few others she received from women who were similarly inspired to become scientists. "I had really influenced some people who had seen the commercials."

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