Countering the Self-Fulfilling Prophecy of Gender Schemas

I am a professor of engineering, who also happens to be a woman of color. People I meet outside of work are often surprised to learn what I do, and for the purpose of this essay I want to talk about why they're surprised. I want to talk about Virginia Valian's work on *gender schemas*: what they are, how they shape our perceptions of those around us and why all that *matters*.

Most people probably don't even realize they have a mental model of what an engineering professor looks like until I fail to match it. These mental models for behavior and appearance are called schemas, and we have lots of them. Schemas serve a purpose—they simplify how we interact with people in the world, especially with strangers. We behave differently when we're checking out a book from a librarian, for example, versus when we're talking to a mechanic about car repairs.

In your head, do you have a picture of a librarian and a mechanic?

Those are *schemas*.

So here's the problem: *schemas are useful, but they aren't neutral.* They alter our perception of others—of their motivations, of their abilities. And gender schemas are some of the most pervasive models there are.

With a few moments' thought, you can probably describe some of the components of gender schemas. If your social environment is dominated by white, middle-class, developed-country norms, they might look something like this: women are caring and emotional, not ambitious, professional, or mathematically-inclined. Men are authoritative, competent, and technical, but not nurturing. (Most of what I'm going to say about how schemas affect women in the workforce is just as applicable to men in nurturing roles. Gender schemas, and thus gender roles and the existing research, generally hew to fixed ideas of 'men' and 'women,' even though we know gender is a spectrum rather than a binary state.)

Some of the effects are obvious: gender bias in hiring has been well documented[1], including evidence that swapping a female name to a male one makes a potential candidate, with identical qualifications, more hireable[2]. But gender schemas have other, more subtle effects.

For example, schemas affect how we interpret what people *do*. So our gender schema may lead us to assume a woman who's away from the office during work hours is taking care of children, while a man who's away from the office is meeting with a client.

And the effects of these tiny, unconscious assumptions are cumulative. Because being professionally competent is not part of the gender schema for women, they're less likely to be listened to, to be given responsibility, and to have their successes recognized as a result of their own ability. Men (who are presumed to be professionally competent) are more likely to be given responsibility, which means more chances to prove themselves, which means they are more likely to be promoted—and the cycle continues. To see how this plays out numerically, researchers designed a computer model of an eight-level corporate hierarchy. The bottom level included equal numbers of men and women and some fraction of the 'employees' at every level would be promoted, but the men had a 1% greater chance of being promoted than the women did. After running it through a number of 'promotion cycles', the highest level in the hierarchy was dominated by men[3]. This illustrates the *accumulation of advantage*—that even small biases can lead to significant effects. It's part of why gender

1. Isaac C, Lee B, Carnes M (2009) Interventions that affect gender bias in hiring: a systematic review. Academic Medicine 84:1440-1446.
2. Moss-Racusin CA, Dovidio JF, Brescoll VL, Graham MF, Handelsman J (2012) Science faculty's subtle gender biases favor male students. Proceedings of the National Academy of Sciences 109(41):1647416479.

schemas make the advancement of women that much more difficult.

What's worse, women internalize these biases. When a woman speaks up in meetings and no one listens to her, she may reasonably conclude that she's not worth listening to. If she's not given a challenging assignment, she may conclude that she's not up to the challenge.

Almost none of this is conscious bias on the part of others. It's rarely misogynists trying to keep women from succeeding in the workplace. It's people thinking they are making good decisions, while in fact their unexamined gender schemas are showing through. And here's another thing: It's not just something that men do to women. All of us were raised in environments that have led to the development of these types of mental models. (And it's not just models for gender—there are similar schemas that apply to other groups, including race. To learn more and test your own unconscious biases, check out Project Implicit at Harvard University[4].)

So why does it matter that we recognize and challenge schemas?

I've done research on why students stay in engineering school or drop out; it's sadly common for women to leave their program, not because they aren't succeeding, but because they feel like they don't belong. In the professional world, women perceive the effects of gender schemas too, and it's a big factor in why they leave engineering and technology careers[5]. Learning about the experiences of other women and about gender schemas means that they can realize that there's nothing wrong with them, and that they do belong in engineering (or medicine, or stunt work, or in any professional sphere).

Just as importantly, though, learning about gender schemas means that we can collectively understand when we might be applying our gender schemas to other people, and then we can stop and reconsider.

Names are power: knowing that gender schemas exist provides us with a way to talk about them. If we face our own implicit biases, we can speak up when when we see gender schemas in action, and we can consciously try to create opportunities for people to go beyond our unconscious expectations.

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Learning about gender schemas (and related concepts, like privilege and implicit bias) is like taking the Red Pill in The Matrix. The bad news is: The world is a lot worse than you thought it was, and you're stuck on a spaceship eating gruel.

But the good news is that now you get to lead the revolution.

Further reading:

Virginia Valian (1997) *Why So Slow? The Advancement of Women.* MIT Press, Cambridge, MA.

Sylvia Ann Hewlett (2014) "What's Holding Women Back in Science and Technology Industries." Harvard Business Review, March 13. https://hbr.org/2014/03/whats-holding-women-back-in-science-and-technology-industries

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3. Martell RF, Lane DM, Emrich C (1996) Male-female difference: a computer simulation. American Psychologist, February: 157-158.
4. Project Implicit: implicit.harvard.edu
5. Hewlett SA, Sherbin L (2014) Athena Factor 2.0: Accelerating Female Talent in Science, Engineering & Technology (research report). Center for Talent Innovation, NY.