Podcast Interview: Erin Cech

PNAS: Welcome to Science Sessions. I'm Taylor Gedeon.

Women have been underrepresented in Science, Technology, Engineering and Mathematics, or STEM, careers for decades, and a recent study suggests that becoming a parent may widen this gender gap. In a recent PNAS article, Erin Cech and colleagues, of the University of Michigan at Ann Arbor, analyzed nationally representative longitudinal survey data from U.S.-based STEM professionals. The survey was conducted by the National Science Foundation and the data spanned an eight-year period -- between 2003 and 2010. Cech found that compared with new fathers, new mothers were more likely to switch to part-time work or leave the STEM workforce altogether. Once parents left the STEM workforce, they were unlikely to return by the time their children were old enough to attend school. Because parenthood contributes to gender imbalance in STEM employment, says Cech, employers must find ways to help new parents—both mothers and fathers--balance their careers with parenting. I spoke to Cech at the 2019 American Association for the Advancement of Science Meeting in Washington, D.C.. Cech recalls how she became interested in disparities in STEM employment.

Cech: As I was moving through my engineering education obviously the lack of women in this space was made crystal clear and as I was learning about circuits and thermodynamics I was also interested in processes of disadvantage that various groups might face within the context of STEM. So my interests in issues of caregiving and parenthood emerged out of research around the culture of STEM and what's valued and not valued in that context. And then related, who is valued or devalued based upon those cultural beliefs. Other research had suggested that people with caregiving responsibilities are devalued in part because they're perceived as not as equally committed to their STEM work because they have children at home. And that that somehow would distract them, or would make them less capable scientists. And so that led to a general interest in parenthood and motherhood that then led to this study.

PNAS: Cech explains how she set about examining the disparity, beginning with survey data from the National Science Foundation.

Cech: Our goal here was to understand as precisely as possible what the career trajectories are of women and men who have children. And so we utilized nationally representative survey data that was conducted by the National Science Foundation and it is a sample of STEM professionals in the United States that follows people over the course of about 7 to 8 years. And so that's really the gold standard to be able to understand these differential trajectories over time and the impact of parental status on people's persistence in STEM. The first wave of the survey was in 2003, and the second in 2006, the third in 2008, and then the final in 2010. What we did is we watched what happened among the cohort of people who were initially childless in 2003 to see what happened to those who had children between 2003 and 2006. Did they stay in STEM? Did they leave STEM? Did they go to part-time work? Did they leave the labor force entirely? And so then we were able to follow up with them not only after they had or adopted their first child but then additional survey waves after that to see if maybe they went back into STEM after being out of it for a while, etc.

PNAS: The data confirmed what Cech had long suspected: new parents were more likely to leave STEM careers than individuals without children. And she also found a gender gap.

Cech: So what we found was consistent with our first hypothesis that new parents are more likely to leave STEM employment after their first child than otherwise similar childless peers. But we found that this was even more amplified for mothers. Nearly half of new mothers leave full time STEM employment after the birth or adoption of their first child. Which really points to motherhood and parenthood as a driver of the underrepresentation of women in STEM but importantly we also found pretty substantial attrition for new fathers as well. So nearly a quarter of new fathers leave full time STEM employment after they have or adopt their first child, suggesting that it's not just a mother's problem in STEM, it's really a STEM worker's problem.

PNAS: I asked Cech whether these findings could influence policy in any meaningful ways.

Cech: Starting from the broadest level, the United States has some of the weakest parental leave policies in the industrialized world. There's very little support for new mothers and new fathers after they have children. There's no paid leave, and often fathers don't have access to those things. At a base policy level, having access to paid leave and also having fathers have access to that same leave can help balance out those differentials and caregiving responsibilities, and the burden of caregiving after the birth or adoption of a child. And then focusing in on STEM fields a little bit more specifically, cultural ideas about who matches ideal STEM professionals really need to be retooled and pinpointed to what people are actually contributing rather than these abstract markers like people's gender, whether they have parenting responsibilities, etc.

I think there's also opportunities at the level of national STEM organizations like NSF or NIH to think about workshops or other practices that might allow people who have stepped out of the STEM workforce to retool, get caught up on the next, the kind of cutting edge work in their discipline, and be able to then launch back in to STEM employment. And then at the organizational level I think there's a lot that can be done. So that includes better policies for new parents to support new parents, and making sure that a culture in the organization is in place where people aren't stigmatized for taking advantage of those policies. And there's also other ways I think companies can innovate to think about how to develop ramp-up procedures for people who might have dropped back to part time work to be able then to go back into full time work.

PNAS: Over the years, Cech has found that women are not the only group to face disadvantages in the STEM field. Another underrepresented group – Lesbian, Gay, Bisexual, Transgender, Queer, or LGBTQ, employees in STEM is also a focus of her research.

Cech: So the next line of research is for a project that's called the STEM inclusion study. It's a large national-level study that surveys members of STEM related professional associations and societies. We're not only able to understand better the processes of gender and equality that we addressed in this paper, but also LGBTQ inequality. In this survey we have over 21,000 respondents, nearly a thousand of whom identify as LGBTQ, and we found that there is persistent and widespread disadvantage for people who identify as lesbian, gay, bisexual, transgender, and queer. Everything from a sense of marginalization and devaluation in their work, to a lack of resources and support for doing their science and

engineering work, to feeling… a perception they don't want to continue in STEM at all. So LGBTQ persons are more likely to intend to leave STEM entirely than otherwise similar non-LGBTQ peers. So what this suggests is that the kinds of disadvantages that are documented in the paper on parents as well as in other research that I am and others have done, suggests that it isn't just isolated to gender or to race ethnicity, but there are widespread patterns of disadvantage within STEM that need to be addressed and have consequences not only for marginalized persons but for STEM in general. Whether its parents who are leaving because they don't feel supported or valued within STEM, or LGBTQ persons are leaving because they don't feel valued or supported in STEM, that really robs STEM of the kind of innovation and advancements those persons are able to contribute because of these societal biases. So that's why generally my research is interested in identifying these processes so that we can think creatively about how to innovate solutions to them.

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