



## Fixing the Leaky Faucet: A Discussion on Women of Color in STEM...with Children

By Caryl Ann Becerra, PhD

When I told a mentor that I was pregnant, just before my dissertation defense, I was surprised to not be readily congratulated but instead, she exclaimed, “Oh, no!” She was concerned about how I was to achieve what she envisioned for me—heading my own lab at a Research 1 institution—if I was having a baby. But, as a Filipina American, having children was something that not only did I want, it was reinforced by my culture as the *most important* goal in life. Flash back to my graduation day from college when I told my grandmother that I was entering a master’s program. She expressed that *more education* was unnecessary and that I should start having children, especially since I could now get a “good job” with a college degree. Already, I was aware that my professional aspirations would have to be tempered by the reality of caring for children. I just did not know then what that would mean. In fact, I still do not know. So when my mentor expressed concern, I naturally became anxious and was filled with questions:

- What impact does having children have on a woman scientist’s career?
- How does one’s culture inform our decision to have children and the number of children?
- If one’s culture conflicts with the professional culture of STEM, how much of a deterrent is the choice of having children to pursuing a STEM career?
- Why are there so few role models of tenured minority women scientists with children?
- And what can be done to improve conditions?

As I navigate my postdoc and am now weighing career options while balancing my family responsibilities, I did some research on women in STEM with children and have found that the least-talked-about challenge is the impact of the early years of child rearing to one’s professional advancement and aspirations, especially for minority women in STEM. In this article, I hope to call attention to the need to include cultural perspectives on having children to the recruitment and retention of minority women in STEM. I have also included perspectives from women who started families at different career stages—as an undergrad, graduate student, postdoc, and pre-tenure, and perspective from a university administrator on current and future trends for institutional family policies.

### The State of Women in STEM

By 2011, women U.S. citizens and permanent residents outnumbered men U.S. citizens and permanent residents in obtaining the highest educational level—the doctorate degree (NSF, 2012). In science-technology-engineering-math (STEM) fields, women were earning 42 percent of PhDs, 45.6 percent of master’s degrees, and 50.3 percent of bachelor’s degrees in 2008 (Rosser, 2012). And yet, there are still few women in science- and engineering-related careers, especially in higher positions such as tenure-track professorships (28 percent). The Society of Women Engineers found that of 6,000 individuals, 25 percent of women (as compared

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to 10 percent of men) who earned an engineering degree between 1985 and 2003 were not employed in engineering or a related field. Every year, approximately 3,000 women with PhDs also leave the field—a concept known as the *leaky faucet*. This condition is not only a great loss of investment by the individual, but a billion dollars a year loss to the U.S. economy (Rosser & Taylor, 2008). There are many barriers to women in STEM (Etzkowitz et al., 1994; Hill, Corbett, & St. Rose, 2010; Moss-Racusin et al., 2012). AAUW (American Association of University Women) reports that workplace environment, bias, and family responsibilities all play a role.

Incidentally, a woman's optimal childbearing years coincide with the critical stages in professional advancement (graduate school, postdoc, pre-tenure). The average age to complete the PhD for women is 34 and the average age to achieve tenure is 39 (Connelly & Ghodsee, 2011). Then there are the years spent as a postdoc that typically follow the average 6.7 years to complete a PhD in STEM (NSF, 2012). Many years of high demand and high job insecurity are spent at each professional stage but arguably, the first few years of child rearing are incredibly demanding. The recovery period after childbirth is sometimes long, and the hours are intense and exhausting, especially when already sleep deprived. Then there is the psychological and emotional stress of feeling isolated or fearing disappointing mentors, and being perceived as less dedicated to the profession (Connelly & Ghodsee, 2011).

These conditions may explain why married women with children were 35 percent less likely to enter tenure-track positions than married men with children (Goulden, Frasch, & Mason, 2009), and that 38 percent of the 50 percent of tenured women with children report having fewer children than they had wanted (Mason & Goulden, 2002). Instead, women may choose a job in industry, believing it to be more agreeable to raising a family (Etzkowitz et al., 1994). Another implication is women experiencing a career gap or interruption, which may present difficulties in returning to STEM careers due to negative biases of a male-dominated STEM culture that portrays a requisite exclusive attention to research achievement (Mavriplis et al., 2010).

While the causes of the *leaky faucet* are more complex, with dual-career issues such as relocating for a spouse also playing a role, I think that the conflict of one's community culture and that of the STEM culture is a topic not well discussed, especially ***in the context of increasing diversity*** (both women and minorities) in STEM and academia.

### **Family Is at the Heart of the Matter**

When I was a graduate student, the most recently minted women professors I knew followed the model of having children shortly after turning in their tenure file in their early forties after fertility treatments. Extending to include more established female professors, the trend was to have none or no more than one child.

I was not the only one to have made this observation. In discussions with other students, I remember the female students concluding that in order to have children they would not pursue an academic career and perhaps, in a joking manner, not even a STEM-related career. But ironically, the distribution of women at different professional levels is the same at other institutions and not just in academia (Mason & Goulden, 2002).

One of my goals for writing this article is to offer a variety of perspectives from successful women in STEM who chose to have children at different career stages. Dr. Gloria Preza, a postdoc at the University of Southern California had her first child as an undergraduate; while Dr. Erika Camacho, an assistant professor of mathematics at Arizona State University, had her son as a graduate student. Dr. Erika Zavaleta, an associate professor of ecology at the University of California, Santa Cruz, had her first child as a postdoc; but Dr. Otakuye Conroy-Ben, an assistant professor of environmental engineering at the University of Utah, had her first child pre-tenure. Although their challenges and the solutions they found were different, all stated that ***family was the most important thing***.

Camacho says, “It is a male-dominated field, not many women, and the ones who are there may be empathetic, but a career choice versus a personal choice can be conflicting. I am Mexican, and I believe that family is at the heart of things; so when you are in science, the demand of the profession and academia...it’s not always easy to have them [both].”

About wanting to have a family, Zavaleta says that she “came from a place culturally and personally—it’s just what you do. There’s never been any question that I wanted to have a family. Everything else has to just fit with that.” Yet she believes that “although my experience was counter to my [cultural] values of caring for a baby myself and with extended family and to not leave a preverbal child in someone else’s care, I felt [as women] we have to set an example that we can do the science really, really well. But we need to be a different kind of role model—a successful scientist and [still] being there for your family.”

Ultimately, there will be a compromise in order to pursue one’s professional goals and the degree to which children are immersed in one’s culture. As Conroy-Ben asserts, “As a Lakota woman, and one of the few American Indian female STEM faculty nationwide, I realize that attaining tenure is important for our family, and is a career goal of mine. Unfortunately, I have had to sacrifice some cultural traditions, such as fancy shawl dancing, due to career demands. Now that I have a daughter, Wayuwita Win, balancing work with family and culture is even more delicate. My husband and I would love nothing more than to raise our daughter near her Lakota or Diné roots, but that is not possible during this time in our lives. In the meantime, Colin and I will make sure our daughter learns the basics of her Diné and Lakota languages, becomes an accomplished pow-wow dancer, and learns the stories of her ancestors.”

Preza, mother of four, worked two jobs as an undergrad and had family support as well as subsidized care. She says, “it takes determination and everyone is different, so you must have a vision of how you want your family to be for the next generation.” She had her second child before she entered her doctorate program at UCLA, during which she also had twins. She found that surrounding herself with supportive people, mentors, and being extremely good with time management were incredibly important. She says, “If you want to have kids, you are going to find the resources. It’s not easy, but you can do it.”

### **It Takes Sacrifices and Adjustments to “Have it All”**

Toward the end of her PhD program at Cornell, Camacho, mother of three, had her first child after her family kept asking when she and her husband were going to have kids. But there were no resources to pay for day care as a graduate student, so she tried writing her dissertation in California where her family could help care for the baby; but eventually, she needed to return to Cornell without her baby. She says, “I would do it again, but it was a high price that I had to pay.”

At her next position at the National Lab in Los Alamos, she faced difficulty with the flexibility of the job, since she could not take the work home nor bring the child to a secure lab, so she took a faculty position in California. She decided that she was going to wait until after she had tenure to have a second child.

Then Camacho joined Arizona State. With a supportive department offering maternity leave, alternative duties, and stopping the tenure clock, she decided she did not need to wait. Now there is day care and a department culture that understands family life. She laments though, that it is still tough to juggle and “the feelings of guilt of not doing enough in both realms persist, but why should you make a choice between family and career?” She asserts that, instead, there should be things in place that allow you to handle both well. “Being a mother is important to the academic profession. It gives you patience, focus, compassion, and insight—such as understanding older students who have children.”

Zavaleta, mother of four, had her first child as a postdoc at Berkeley and although she had a job offer, she deferred. At UCSC there were two quarters of active service—modified duties. Without that, she is not sure if she “could have pulled it off.” She also recommends, assuming you have a working spouse, “to spend your entire income on your childcare (day care or in-home care) so that you can go to work. It’s totally worth it—if it keeps you from quitting your job for a couple of years. It won’t be forever.” But although there is great childcare, she says that it is still hard not to feel conflicted to not continue to care full time for a nine-month-old.

She found that having a modified day schedule where she could be home in the late afternoon and then back to work at night from home works well. She believes that “balance might mean not from week to week or year to year. Two or three years can go by where you are sleep deprived. Think in chunks of a few years at a time and letting some things go for periods like that and then catching up. A lot of things can fall by the wayside and it’s okay, you can pick it up later.”

Conroy-Ben became a new mom as a faculty member at the University of Utah, where faculty have the option of postponing tenure for a year and spending a semester on reduced duties of no teaching but while still continuing a research program. She has not chosen to stop the clock because she is “not really taking time off because I am conducting research and writing.” Conroy-Ben believes that “when you are meant to start your family, it will happen.”

### **Making Change at the Institutional Level**

Many institutions have family policies, but no policy is found at all institutions. Some institutions have policies for staff and students but not for faculty, as Dr. Camacho experienced prior to coming to Arizona State. “It’s important to acknowledge the diversity of institutions and the diversity of each type of institution. Be aware of the range of possibilities. How you manage your family in the context of your career, and the expectations and assumptions, depends on the institution,” says Dr. Zavaleta.

Associate Dean Dr. Maria Teresa Velez says, “As an administrator [at the University of Arizona], I can say that universities are very aware of the difficulty young faculty face in maintaining balance. Many [universities] are prepared and have policies for childcare leave also for fathers. In addition, departments may have their own

policies to help young faculty not only begin careers, but start families when it is crucial that they do so given biological realities.”

She adds that there may also be informal department policies in which teaching requirements are reduced for the second year, after the university policy of childcare leave ends. Faculty then is given additional but less-taxing duties where part of the work can be accomplished at home, such as committee work. Also, at the University of Arizona and a few other universities, “graduate assistants—both men and women—can have paid parental leave for a newborn or a newly adopted child for up to six weeks.” She agrees that men are taking a greater proportion of childcare responsibilities and therefore, balancing career and life is an issue that will be felt by everyone. She speaks from her professional experience as a graduate dean, but also from her own experience, having started her PhD when she was eight months pregnant with her first child at age 31. That baby is now a 34-year-old MD-PhD doing her medical residency and struggling with the very issues this article raises.

Even at the federal level, career- and life-balance issues are starting to be addressed. In recognition of the loss of highly trained STEM professionals, NSF announced the “NSF Career-Life Balance Initiative” in 2011, which provides greater flexibility; for example, postponement of grants for childbirth or adoption, parental leave, and supplements for research technicians.

But with existing policies in place, practicing them becomes even more important if we are to see better policies and to change the climate surrounding family-life balance. Some institutional policies are not unanimously practiced. For instance, “opt out” policies in which faculty have the option to stop the tenure clock are not used sometimes for fear of being stigmatized as someone not competitive or dedicated (Connelly and Ghodsee, 2011; Rosser, 2012). Yet it is important to use these policies in order to change the culture of academia. Another important aspect to retention is readdressing career gaps used for family care by either preventing or facilitating reentry into STEM careers (Mavriplis et al. 2010). Women should have “the confidence to stair-step their careers”; that is, don’t think of climbing a ladder but of a “strategic combination of climbs, lateral moves, and planned descents (Slaughter, 2012).”

### **Fixing the Leak**

If we are serious about increasing the diversity in STEM and academia, we need to talk more about the reality of cultural and personal values in our professional lives, and to find ways to continue to advance in our profession as well as change perceptions for the better. Unless women minorities feel empowered and capable of balancing both through concrete institutional policies and practices, we will continue to lose out on talent and innovation.

### **Pearls of Wisdom: *Some Friendly Advice***

- “Surround yourself with supportive people. Mentors are important. Look for signs of how supportive someone’s lab is, but don’t sell yourself short.” —Gloria Preza.
- “Learn to be better at multitasking and prioritizing things, but also know when to focus on one thing as there are times that call for 100 percent of your effort.” —Erika Camacho.

- “It is very important to have a plan, you have to have an IDP. Have dates of when you have to do things and learn to become extremely good with time management. You may have to go slower and take more time.” —Gloria Preza.
- The timing of having another baby in relation to the first should be as late as possible to be able to still “stay in the game.” —Professor Mommy.
- “There are many things to factor when deciding to start a family—the biological clock and important career milestones, and even the time of year of the birth; but with all that said, life happens and plans change.” —Otakuye Conroy.
- “Be kind to yourself. Don’t let norms constrain you. Forge your own paths—what will work well with both family and work.” —Erika Zavaleta.
- “Be sure to have children with a man who is highly supportive of your career and be willing to contribute his share to child rearing and housekeeping in general.” —Maria Teresa Velez.

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### About the Author

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### Related Resources

- "Why Women Still Can't Have it All" – Atlantic Monthly article  
<http://www.theatlantic.com/magazine/archive/2012/07/why-women-still-cant-have-it-all/309020/>
- View the entire winter/spring 2013 edition of SACNAS News  
<http://sacnas.org/about/stories/sacnas-news>