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Reflections on motherhood and the impact of COVID 19 pandemic on women's scientific careers.

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I am writing this piece in a bit of an impulse. It has been several months now since life was normal. I used to have childcare support and I could often go outside to work, to run errands or for any other reason. Now, my two-year-old daughter wakes me up at about 6:30 AM and I play with her until lunchtime. She takes a two-hour nap in the afternoon, a period I use for remote work meetings. When she wakes up, I stay with her until around 7:00 PM. Then it is TV and dinnertime for her and work time for me again. She typically goes to bed at 8:30 PM, and I stay in her room until about 9:30 PM. At that point, I am exhausted. I can rarely work at that time. I have been in self-isolation at home with my elderly mother, who is at high risk for SARS-CoV-2 infection. Of course, it does not help that I no longer can count on external childcare and that in my country the response to COVID-19 has been the second worst in the world, with potential to become the worst soon.

I decided to write this essay while reading one of those e-mails that make your hands shake and increase your heart rate. It was a message from Dr. Alessandro Prinetti, Chair of the ISN-CAEN Committee, informing the result of my ISN-CAEN Career Interruption Re-entry Grant application, which I had applied for last April. As I opened his email and I read those words we are always happy to see in the computer screen: "I am delighted to inform...". I confess that I stopped reading right there, and after cheerfully sharing the news with my daughter, my husband (by email) and my mom, a little movie started to play in my head.

Being a first-time mom, a scientist, professor, mentor, wife, daughter and the main childcare provider has been very challenging. I met my husband in Boston ten years ago during my

sabbatical at Harvard and we have been married for 4 years now. Because I am a tenured professor in Brazil and he owns a company in Boston, we had to resort to a long-distance relationship. Many colleagues do not readily acknowledge or fully understand some of the challenges of being a mom and how it influences the career of academic professionals, so I will describe them briefly.

Our daughter was born in December 2017 and I stayed out of the lab on maternity leave for six months. During that period, working on cognitively-demanding tasks requiring a lot of attention was difficult, to say the least. Breast feeding and waking up at odd hours at night made me feel tired and sleepy and, because my husband was away most of the time, the regular chores od taking care of a newborn baby were doubled on me. However, because the graduate students I supervise had their theses and dissertations timelines, I still felt compelled to mentor them, in addition to writing grants and submitting papers, but the outcome was not the same as it used to be in the past. I felt first-hand what most Universities/Research Centers now see as a major problem for women in science. Maternity has been shown to negatively affect women's scientific career in STEM (science, technology, engineering, and mathematics areas) and definitely contributes to gender imbalance and women underrepresentation in STEM Jobs (Cech and Blair-Loy, 2019, Huang et al., 2020). Cech and Blair-Loy's (2019) longitudinal study performed in the USA revealed that 4-7 years after birth or adoption of their first child, a striking proportion (43%) of new mothers leave full-time STEM employment (as opposed to 23% of new fathers). In addition, a significant proportion of new parents in this group - 38% of new fathers and an impressive 71% of new mothers - cited the reason for departing from STEM jobs as "family-related" when compared with respondents that have no children. This scenario clearly illustrates how challenging it is for new mothers to sustain full-time careers in STEM. Indeed, I faced many situations that made me think about quitting my job. The above-mentioned study concludes that full-time work in STEM fields is particularly difficult for new parents, especially new mothers, to combine with childcare responsibilities, and suggest that organizations and public policies should engage in legislative, institutional, and cultural changes in order to change this scenario.

In addition to the impact of motherhood on my career, there is also an unprecedent economic and political crisis in Brazil with terrible consequences for science and scientific careers. The

federal investment in science and education in Brazil has all but stopped. Personally, my time to write grants is much more limited now and because of my teaching load (approximately 9 hours per week for 15 weeks per semester, this is in one of the country's top research universities), administrative meetings, student mentoring in the lab, and family duties, I could not find a way to further increase my work hours. Of course, since March 2020, given the COVID-19 pandemic, the negative effect on women in STEM has been even worse (Langin K, 2020). I had to move to my mother´s house, because she is elderly and belongs to the high-risk group (by the way, another factor that disproportionally impacts women in STEM is taking care of aging parents). As with many other families, I no longer have access to childcare. Thus, I have to care for a two-year-old full-time, work during her sleep times, and take extra care in the household to avoid any of us contracting SARS-CoV-2 infection. I try to schedule lab and administrative meetings during my daughter's nap time but, when it is not possible, I have to rely on my mother's help. In fact, I am writing this text during one of these short breaks. On the top of everything, as many other academics, I have to prepare remote classes. I dream of the day that I will have 4-6 straight hours to dedicate to my academic duties and, more importantly, to lab projects. I love being with my family, but the impact on my career is noticeable and I would certainly struggle to be able to maintain a research lab. In fact, there is a worldwide concern that the COVID-19 pandemic will further deepen the gender gap and gender inequalities in scientific careers, above all for mothers of young children (Staniscuasky, F et al.; 2020). In the case of Brazil, a study performed with 15,000 women in science (graduate students, post-docs and PIs) showed that the pandemic is hitting mostly the scientific productivity of mothers of children under 12 years old (Parent in Science, 2020)

Different institutions are starting to recognize the disproportional impact that women in STEM are subjected. If we want to be inclusive and keep academia diverse, initiatives to support teaching load reduction, paid leave, flexible working hours, paused grants during maternity leave, and no-cost grant extension are needed. Most importantly, institutions need to provide affordable childcare if they want to maintain women in STEM. Scientific societies, such as the International Society for Neurochemistry (ISN) also have an important role to support diversity in science. Initiatives to foster Neurochemistry and consider the needs of primary childcare providers are a welcome support.

Being awarded with the ISN-CAEN Career Reentry Grant was a breath of fresh air and has been - and will continue to be - invaluable to me, especially in the present pandemic scenario. In addition to support critical experiments for my students, it reassures me that I am in the right direction and makes me proud that the scientific society I belong to cares for parenting scientists. This makes the challenges and sacrifices that I am facing daily worth it.

When a woman scientist takes a maternity leave, there is a great chance she will face reduced productivity, therefore more funding mechanisms such as the CAEN Reentry Grant offered by ISN are invaluable to help bridge productivity gaps. In such daring times for science, particularly in Brazil, support to help women maintain a minimum level of productivity is not just welcomed, it is a moral imperative if we are serious in our quest for equal opportunities.

I am extremely thankful to ISN for supporting scientists that are primary childcare providers and have had maternity or paternity impact their careers. On behalf of all parents working on neurochemistry I want to acknowledge ISN, and concluding by noting that such initiatives to support diversity in science are in the best interest of science itself.

References

-E. A. Cech, M. Blair-Loy. Historical comparison of gender inequality in scientific

careers across countries and disciplines Proc. Natl. Acad Sci U.S.A. 116, 4182 (2019)

-J. Huanga, A. J. Gatesa, R. Sinatrad, and A. L. Barabasi . Historical comparison of gender inequality in scientific careers across countries and disciplines.Proc. Natl. Acad Sci U.S.A. 117, 4609–4616 (2020)

-F. Staniscuaski, F. Reichert, F. P. Werneck, L.de Oliveira,P. B. Mello-Carpes, R.C. Soletti, C. I Almeida, E. Zandona, F.K.Ricachenevsky, A. Neumann, I. V. D. Schwartz, A. S. K. T., A. Seixas, L. Kmetzsch, Parent in Science Movement†. Impact of COVID-19 on academic mother. Science 368 (6492), 7242020 (2020)

- K. Langin.The pandemic is hitting scientist parents hard, and some solutions may backfire. Science (2020) doi:10.1126/science.caredit.abe1220