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The Stories We Tell

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I recently visited the Kennedy Space Center with my 9-year old daughter. I am not a space travel fanatic, but I would highly recommend this place to anyone: seeing the rockets in full scale (including the Saturn V rocket that sent humans to the Moon), standing in the command center of the Apollo mission, seeing the actual Space Shuttle Atlantis (and yes, the Canadarm) that flew 33 missions before retiring *right there* — it was a really humbling experience. We spent an entire day there, exploring the many exhibits and reading an overwhelming number of panels. At the end of the day, as we were on the bus back to the main parking lot, the video talked about the importance of the Center to motivate and attract the new generation to STEM fields and space exploration. So I asked my daughter if she wants to be a rocket scientist or an astronaut. Her answer was immediate: "No way, it sounds impossible."

She's completely right. In describing the cutting edge technology, the exhibits highlighted complexity. While focusing on the inspirational nature of space travel and the people involved in it, they made them all appear superhuman. They went for motivation, awe and marvel, but they forgot about being relatable. Leaving astronauts aside (their main characteristics were bravery, courage and fearlessness — as opposed to hours of hard work, training and perseverance), all the scientists involved were all portrayed as geniuses. There was no real discussion of a series of failures and lessons learned, no moments of trial and error upon which eventual success was built – rather, it was the standard Hollywood-style moments of deep and seemingly random insights by separate individuals that drove progress forward. Moreover, there was no mention of the sheer number of people who worked on the program, which by some estimates is over 400,000. The exhibits made it look like each one of only a dozen engineers knew every single piece, nook, cranny and wire of the entire rocket. Of course it looks impossible to be one of them!

In our efforts to inspire, we often construct narratives that unintentionally exclude. Consider the role models we present to our students in mathematics. We have Carl Friendrich Gauss and the famous sum of integers example, a story of a child prodigy, which I tell to my first-year university students, who I now suspect may experience it as proof of how far away from being competent in math they are – after all, they weren't inventing new math formulas at the age of 12. We have Srinivasa Ramanujan and formulas appearing to him in dreams, while the rest of us mortals can barely remember what we dreamed about at all. We have Isaac Newton discovering calculus in isolation during the plague, while we struggled to keep sane being stuck inside (with technology!) during the Covid-19 pandemic. According to these stories, to do well in math, you must be an exceptionally gifted child, have magical dreams or be a genius loner – this last part also being helped by the many narratives of mathematicians as socially awkward individuals. Unsurprisingly, it gets only worse for women: we get Katherine Johnson calculating trajectories at NASA with near-mythic precision and the undeniable genius of Emmy Noether revolutionizing algebra. But we also have the women who overcame extraordinary barriers simply to be allowed to study mathematics at all such as Sophie Germain learning mathematics in secret and corresponding under a male pseudonym, while Sophia Kovalevskaya entered into a marriage of convenience to be allowed to study abroad. These are powerful stories, but they make success feel unattainable without extraordinary resilience and sacrifice.

The problem is not necessarily our role models though, it is the stories we tell. Not only do we highlight the prodigies, the once-in-a-generation thinkers, but we also compress careers into neat timbits of brilliance. While many of our role models are iconic, if we only showcase their effortless brilliance, endless confidence and singular devotion, then we suggest that exceptionality is a prerequisite for belonging. In reality, told differently, these are also the stories of people arguing, hypothesising, revising, collaborating and sometimes simply getting things wrong for a very long time before they got anything right. Isaac Newton was not only a brilliant scholar, but also someone deeply entangled in bitter disputes over credit and ideas with Leibniz, holding onto his grudges and turning grievances into a personal vendetta. Ramanujan was a mathematical prodigy that failed all other school subjects, got expelled and suffered mental health challenges throughout his life. Emmy Noether was known for her collaborative approach, working closely with colleagues and students, leading many seminars where ideas were shaped collectively. Sophie Germain persevered through three attempts over seven years of research until the Paris Academy of Sciences was satisfied by the findings and awarded her the Academy Prize. We forget the human side to our human examples.

But speaking of role models, if our goal is not only to inspire but to invite, then we need to include different kinds of "heros" and tell their stories too. Stories not just about trailblazers and firsts, but about typical paths into the discipline and the many people who follow them. Most people are not looking to be an exception – they want to be part of a community, not fighting for representation and acceptance, but focusing on collaboration and work. This requires a shift in emphasis: from exceptional milestones and celebrating outliers to inclusion. I'd like to hear stories of what a regular mathematician's day looks like, where their struggles and successes come from, who they work with and how they move through the field. I want to hear the stories of the very concrete people that I can see in the hall and maybe work with someday. What's missing is not inspiration, but inclusion and recognition of the many ways one can participate in mathematics and science, of collaboration and community, of the fact that most advances are not the result of isolated flashes of genius, but of communities of people building understanding over time. Our discipline is sustained and flourishing due to many.

Let's allow the stories to change. Our narratives must reflect the work we actually do; not a distant world of superhuman brilliance, but rather a human one: built by many, sustained by many and open to many.