

Chapter 11: What It Means to Be a Leader

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Although my path to academia has not been direct, when I look back at my childhood, it isn't a surprise that I somehow found my way here. As a kid I was full of fire — energetic, independent, fearless. As a young adult my endless curiosity, interest in the natural world, and general inability to sit still led me to travel far and wide, ever in search of my elusive “life’s purpose.” I wanted to see, hear, smell, feel, and taste everything. I wanted to meet people who were different from me, who could teach me new ways to view and interpret this crazy and beautiful world. I wanted to know where and how I fit into this big puzzle called life. It must have been this craving for adventure and a deeper understanding of how things work that slowly yet irrevocably drew me into the sciences, for I never explicitly aimed for this path.

At a certain point though, it dawned on me that I had officially entered academia. As a young researcher, I greatly valued the opportunity to reflect on issues of food security that were very important to me both scientifically and personally. I relished being able to ask pointed questions, to identify issues that required more understanding, and then to utilize all my available resources (creativity, logic, personal connections, university funding, and a good dash of luck) to address this uncertainty. I enjoyed the independence that my work granted me, and the freedom I had to develop my own ideas. I learned to appreciate each step of the scientific process: the formation of a hypothesis, the organization and planning of the experimental approach, the field work, mixing chemicals in the lab like a mad scientist, and then creating and writing a story from the numbers that eventually filled my spreadsheets. I could focus

entirely on my work, managing each step of the process. I deeply enjoyed this familiar sequence and could easily see myself continuing in just this way for a long time to come.

As time would tell, however, my life in academia did not continue like this indefinitely. I found that the old saying “change is the only constant in life” was true for academia as well. Slowly — so slowly, in fact, that I can’t even pinpoint when or how it started — I found my tasks and responsibilities shifting, evolving in ways that left me uncertain of my role in academia. Just as a carefree young adult suddenly realizes their free time is being encroached upon by thoughts of paying bills and scheduling doctor visits, as a young scientist I eventually realized that my focus had shifted over time as well. Rather than being able to direct all my time to the project at hand, my daily tasks were increasingly filled with writing proposals, managing budgets, teaching, mentoring students, and sitting in on seemingly endless meetings — activities that seemed to take me further and further away from engaging in actual science.

In my case this inevitable shift in focus came hand in hand with motherhood, which magnified its impact on my changing professional perspective exponentially. No other experience came remotely close to teaching me that I had reached a point in my life where my own priorities were simply no longer the main focus. The message was loud, simple, and clear — and often accompanied with a wet diaper. As I learned to adapt my way of thinking and balance my life as a scientist with my life as a mother, I found that my role and focus within academia naturally shifted as well; my perspective on what constitutes science and what my role was within this larger system was inevitably impacted. Whatever the impetus for this paradigm shift may be, I think this is something we all experience at some point in our professional progression. What is more, no matter how fiercely we may fight these growing pains, I argue that such a change in perspective is not only positive, but indeed vital to self-growth and development. In my experience I found that this “zooming-out,” if you will, did not diminish the importance of my own work in any way. Rather, it allowed me to see even more clearly how my primary research focus is just one small puzzle piece in the bigger picture, and that we as scientists are all working, in one way or another,

towards the same overarching goal. In just the same way, it showed me that my role in this larger scientific picture will, and should, change over time as well.

This budding realization made it much easier for me to accept my changing responsibilities in the workplace. For example, as a mentor and supervisor to students, this new role meant reducing my time in the lab and handing over the reins to the next generation of curious minds. Of course, I have always liked the details, the basic hands-on aspects of research. However, my evolving perspective helped me to see that there is much more to it. The longer I stay in academia, the more I realize that what we do as scientists is not, and should not, be solely focused on the numbers. During my younger days, “science” was always focused on data collection, analysis, and the final step of writing the inevitable report of said results. *Done. Check. Science accomplished.* The years of thought, effort, money, and time necessary to provide me with the opportunities to investigate intriguing questions and to prepare my results were beyond my field of vision. Yet as I have continued in science, I have become aware of these issues; indeed, I now actively grapple with them every day. In so doing, I have come to the realization that I am engaging with science not only as a researcher, but also as a supervisor and mentor. And, as I have begun to adapt to this new role, new questions about the purpose and impact of research, as well about its potential to affect change, have arisen.

Through deep contemplation amidst my changing perspectives, it has become crystal clear that science, regardless of the field or topic, is ultimately based on human interactions and connection. Scientists do not work in a vacuum. Research does not begin and end in a lab, spreadsheet, or journal. Networks of people and thoughts are what spark and inspire the ideas behind projects, and ultimately drive these ideas into action. Along every step of the way, it is this human touch that really makes the difference. It is understood that even the most well-cited articles in the top journals cannot alone change farmer attitudes and management practices, nor instigate a change in the way policies are designed. This requires a human connection, outreach, interaction, and trust. Numbers alone are not enough to make the changes to which

we aspire. At the end of the day, no matter how independent we imagine we are, it is a network of people that drives our work. This network deserves to be not only acknowledged, but nurtured.

At the forefront of my vision are the students in the classroom, field, and lab who help produce the numbers, as well as the people these numbers are for (in my case, the farmers, consumers, policymakers, and other scientists in similar or overlapping fields). And it is this recognition that motivates my overall research goal: to contribute to a better understanding of how nutrients turn over in soils, and how the push and pull of these nutrients, between soil minerals, plants, microorganisms, people, and loss into the environment, influences the food produced in our communities, the health of our soils, and the functioning of entire ecosystems. As I have continued in this field, the imperative to address the sustainability challenges facing us has become clearer. Here again, my children have shaped my perspective and made me cognizant of the need to support the next generation of community leaders, activists, and scientists.

My two beautiful children, who fill my ears and heart with exhilarating tales of their day and songs celebrating the joys of watching leaves fall from the trees, contribute to my work in countless ways, refilling my batteries each night and motivating my passion to improve our food systems. What is more, I see this same enthusiasm and energy in the students, flooding the university each semester, who are either just beginning their studies or excitedly poring over the possibilities for their next career step. These are eager, curious minds that need to be nourished. They are not worker ants whose only task is to deliver data points in the spreadsheets of academia; they are potential future scientists of the world. Through time and deep reflection, both within formal leadership courses and simply on my own during long walks in the forest, I have come to realize that it is my job as a scientist and supervisor to be a role model for these students. I must do my best to instill in them the knowledge that they can make a difference, and that they, collectively, can be a positive force in the world. It is critical to remember this during those hard days when things don't go well, when the burden of proposals, revisions, bureaucracy, and rejections feels overwhelming. In these times of stress, I see all too often that not only myself, but we as scientists tend to

stay to ourselves, weakening the connection and transfer of excitement with our students and colleagues. I find this very dangerous. We deserve to give the people around us, and ourselves in the process, the chance to re-connect. This connection, this invisible network which promotes the transfer of ideas and motivation, is what keeps science alive. It is important to identify, accept, and take seriously the fact that we have the power to either weaken or strengthen these networks through our actions. We are not fully independent scientists focused on our own work — we are leaders.

There, I said it: we are leaders. Leadership is an integral role of academic researchers, and relates to how well we support our students, and not simply to the overall numbers we can report in annual statistics measures. Yet sadly I have the feeling that this aspect of what we do is rarely discussed, and almost never highlighted. For, if you cannot put a value or number to this, if it is not evaluated in a tenure dossier, why put effort into consciously developing this quality, right? Wrong. As a mother, my leadership role came naturally, easily, and without hesitation. There were no doubts about my leadership style, or the qualities I aimed to exemplify and nurture in my children. In contrast, however, I have struggled greatly with how to be a leader in academia, especially because the issue is very rarely discussed. This is partly because the qualities of “the ideal scientist” were never explicitly taught, nor were they written in an official guideline that could be studied. Instead, these characteristics were imprinted in my mind upon entering academia, as shown to me through the actions of my mentors and successful people in the field. Through my eyes, these scientists were strong, independent, confident, competitive, productive, and tireless workers — calm, cool, and collected at all times — who did not show their emotions, let alone let these emotions slow them down, as they climbed the academic ladder. Nowhere did I see an alternative way of being modeled, and thus the only thing I could conclude is that this “checklist” of characteristics must simply be what is required to make it in the sciences.

Despite my passion for research and decision to stay in academia, this vision of a scientist has always given me doubts about my place here. It is safe to say that I did not, do not, nor will I ever, fit this vision. Peo-

ple come first, not numbers. To many people in the scientific community, this trait is seen as a weakness, and for a long time I believed that as well. As my perspective has shifted and continues to shift over the years, I now see that this way of thinking is seriously flawed. For in fact, such a checklist does not actually exist. We may consciously or unconsciously believe it does, but it is simply not the case. What is more, while many of these traits are indeed beneficial from a publishing and scientific standpoint, this list does not give any emphasis to the leadership role that I believe we as scientists must uphold. It was this change in perspective that led me to a very significant “aha moment.” I realized that I am not bound in any way to a non-existent, invisible checklist. I can be genuine and true to who I am, to the values I want to bring to my work, and not only survive, but indeed thrive in this environment. This change in perspective allowed me to stop wasting time worrying about the fact that I will never live up to what I thought others expected me to be. Instead, I put my thought and energy into carefully considering what characteristics I personally find valuable in a scientific leader. I then highlight and celebrate my strengths which contribute to this goal and continue to improve upon areas that I feel need further development.

It was not enough for me to simply think about these characteristics in an abstract manner. I needed a tangible guideline and reminder of what a good leader is, tailored to me and my own leadership goals. And with that in mind I decided to write my own “checklist of characteristics of a successful scientist and leader” and hang it in my office, where I could be inspired every day. Among other things, it states that a good leader needs to have the ability to be both strong and empathetic, and to be independent to a certain point, while also not neglecting the importance of actively collaborating and staying connected to peers and co-workers. It comforts me by stating that a good leader does not need to be overly confident that they know everything and have a solution at their fingertips at every moment. Instead, it is much more effective (and realistic) to have confidence in what they do know, and confidence that they have the ability to find solutions to issues that may arise outside of their own expertise. It states that a good leader does not need to be rigid and unyielding, but instead should be open-minded and flexible in

their scientific approach; they should stay up-to-date on the ever-evolving topics related to their field, rather than sticking to one way of doing things without wavering. A good leader should be energetic, quick, and ambitious, but must also remember to have a healthy work-life balance and to support the same for their team members. A good leader must find ways to foster a positive team atmosphere, and to actually *feel and use* their emotions to be understanding, supportive, empowering, trusting, and inclusive.

This is, of course, just the start of my list, and most likely there will never be an end. Just as my perspective on my role in academia has shifted over the years, I have no doubts that this list will continue to change, and that adjustments will be made. I see this not as uncertainty, but as progress. I am excited by this fact and welcome the opportunity to further develop these skills and in turn teach the next generation of scientists the importance of leadership. I hope I can encourage others to reflect on and develop their own values. I hope it gives them courage to foster an atmosphere that they may not necessarily have experienced themselves, but that they hope to create for others. I hope it gives people an opportunity to think about the bigger picture of what we are all doing day-to-day to create an environment where not only science, but leading and encouraging people from the inside out, takes precedence over individual accolades. Ultimately, I hope this reflection helps shift the focus in academia from an “*I can do*” attitude to a “*we can do*” attitude, where we see our work not as an individual puzzle piece, but as one small piece of the big picture, where we are all contributing to the same overarching goal to create positive, on-the-ground changes in society.

