Cultivating the Human Dimension in Research

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Summary

According to "Research Exemplars", research requires attending to matters of heart as much as mind. The human dimension in research—relationships, passion, resilience, and leadership—was the common thread in their advice for a successful career. We discuss strategies to cultivate intra- and inter-personal skills fostering these aspects of research.

Science must come from the heart. Treat everyone with respect. Listen. Be authentic. Ask for help. Don't be afraid to say you don't know. Communicate. Put your mentees first. Don't give up. Stay humble. Be honest with yourself. Give yourself time to think.

These are the messages we heard about being a successful researcher when we asked 52 well-respected principal investigators for their top career lesson during a recent interview study (http://integrityprogram.org/exemplar-project/). We contacted nearly 1,500 research administrators, academic deans, department chairs, and directors at the top 200 research institutions in the U.S., accredited U.S. medical schools and schools of public health, and the National Institutes of Health (NIH) Intramural Research Program. We asked them to nominate "Research Exemplars"—researchers who conduct high-quality, high-impact, federally-funded research in any discipline and who exemplify integrity and professionalism. We required each nominee to receive at least two nominations. A panel reviewed the nominations and the nominees' CVs to select finalists.

The Research Exemplars we spoke with were highly accomplished and had outstanding reputations for professionalism and integrity. They held an average lifetime grant funding of $27 million and published, on average, 138 peer-reviewed articles. Nearly all Exemplars (90%) were full professors or senior investigators. Most (77%) worked at public universities, and the remaining at private universities (15%) and NIH (8%). The majority were male (71%), 50 years of age or older (73%), and born in the U.S. (73%). Exemplars conducted diverse types of lab, clinical, computational, and field research in the life, health, social, physical, and earth sciences.

Recognize the Human Dimension in Research

We asked the Exemplars an open-ended question soliciting advice for early career-researchers. Most Exemplars offered several pieces of advice which we organized by themes into "Keys to Success" shown in Figure 1. Their guidance offers important messages for

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those training for a career in research, actively engaged in research, and mentoring junior researchers. They emphasized the human dimension in research—with the top themes of building lasting relationships, working with passion and resilience, and practicing effective leadership. We explain the keys in Table 1 and discuss them below.

What was the biggest key to success? Relationships. Over half of the Exemplars considered good relationships foundational to success in research. The Exemplars remind us of the importance of "not going it alone" and the need to "let people see who you are…be human, which means communicate". Investigators need trusted confidants from whom to seek feedback, ask for advice, and collaborate. It is not an unusual notion that researchers need mentors and collaborators. But often we think about these as most critical early in one's career. Exemplars see continuous engagement with the community of scholars around them as the most important element to their sustained success.

The Exemplars acknowledged the demanding nature of a career in research and the reality of frequent setbacks. However, many discussed how passion for one's work helps researchers remain resilient in the face of challenges and find daily joy in one's work. They advised researchers to maintain a thirst for the discovery process and a drive to make an impact. Another key focused specifically on resilience. We heard about the need to use criticism as an opportunity to learn and move forward with renewed determination. Indeed, positive "psychological capital" (e.g., resilience and optimism) supports well-being among leaders working in challenging environments (Roche et al., 2014).

Similar to the need to build strong relationships outside of the lab, the Exemplars provided advice about leadership inside the lab. They emphasized building positive relationships with students, trainees, and staff through mutual respect and communication. They believe that transparent, respectful work environments are necessary to conduct the highest quality research. Thus, they encouraged researchers to be intentional when building their team and look for people who are team players. Exemplars also told us of the need to explicitly tell new members collegiality is expected, and as the leader, communicate in such a way to set a positive example.

The strategy key focused on the need to strategically pursue funding and research opportunities that will contribute to your long-term goals. One Exemplar noted: "You're not going to be able to envision every little detail about what's going to be happening in 5 or 6 or 10 years, but it's good to have a vision…take time to envision where you are going and set some goals and figure out how to get there." Exemplars also noted the need to stay focused and to advocate for oneself. They advised researchers to learn to "say no" to opportunities that do not fit with their priorities and noted how challenging this is early in one's career.

We also learned about the need to seek balance. This key focused on maintaining some interests in addition to work or simply allowing oneself time to step away from work. This was a matter of personal well-being for some. For others, it connected directly to doing good research: "Give yourself time to think…read outside your discipline…read fiction and

poetry, in order to be a good researcher…" The Exemplars recognized the challenge of striking true balance, but urged researchers to maintain an awareness of it.

Several Exemplars also advised about upholding one's integrity. They spoke of the need to "stay grounded", be honest with oneself, and make an earnest commitment to the hard work required for success in research. In this key, some Exemplars explicitly told us about the need for humility as a researcher. We think it is notable that humility was also implied in several others keys. Specifically, Exemplars described the need to acknowledge when you need help, learn from criticism, and listen respectfully.

Four Strategies for Developing Intra- and Inter-personal Skills

We were intrigued that the keys to great research and a successful career resoundingly emphasized the human dimension in research. In recent years, federal and private funding agencies have sponsored initiatives to increase the rigor, reproducibility, and impact of science. Achieving these goals will require so-called "hard skills," including expertise in study design, standard operating procedures, and data analysis. However, if our research exemplars are correct – and we think they are – achieving these goals will also require a complementary series of "soft skills": intra-personal and inter-personal competencies that foster relationship building, leadership, and professional effectiveness.

Inter-personal competencies like communication, conflict resolution, motivating and encouraging others, empathy, and building effective teams are at the heart of relationship building and leading. Intra-personal competencies are central to effective relationships and leadership, but more broadly to professional effectiveness. Intra-personal competencies include understanding oneself, for instance, knowing what one finds motivating, frustrating, and inspiring, and the ability to manage emotions, maintain composure in stressful situations, accept professional accountabilities that come with one's work, take initiative, and persist.

The need to actively develop these skills is familiar to corporate executives who complete leadership development programs. Principal investigators are the executives of research, and they too need these skills (Antes and Dubois, 2016). We recognize that this may sound discouraging to some researchers who pride themselves on their introversion and analytic talents over their knack for striking up conversation or understanding what makes people tick. We encourage researchers to challenges themselves and step outside their comfort zones, and offer four strategies for developing the soft skills that underlie the keys to success:

1. **Set the goal.** Commit to developing the soft skills that will take your team and your science to the next level (Johnson et al., 2012). View these skills not as a luxury, but as a necessity. Setting a goal, writing it down, and announcing it to colleagues makes goal achievement more likely.

2. **Seek out leadership development opportunities.** Like other research skills, soft skills can be learned and refined (Day et al., 2014). Most people are not natural born leaders or great communicators. Many people are not naturally aware of

their stressors or emotional triggers. They benefit from guidance on strategies to help them thrive amid highs and lows in their careers. Even the simple act of stopping and taking a short walk, if done habitually, offers a strategy to gain renewed perspective, manage frustration, and sustain enthusiasm. Leadership development activities such as participating in leadership development seminars, enlisting the help of leadership coaches or mentors, and reading about leadership can help you develop these skills.

Leadership development seminars often focus on inter-personal skills, like strategies for helping staff reach their potential, resolving workplace conflict, building effective teams, and making strategic decisions. Others focus on communication skills, emotional intelligence, or strategies for preventing burnout. Leadership development programs also encourage individuals to develop intra-personal awareness, such as an understanding of one's strengths and limitations. Many universities and medical centers now offer leadership training to employees who hold, or may hold, leadership roles. If possible, find a program specifically tailored to researchers (Seeliger, 2012).

Leadership development programs are appropriate for both early-career professionals and seasoned ones. Attendance at an effective leadership development program reinvigorates a sense of purpose and direction. Perhaps most importantly, these programs require professionals to do something they often fail to do: Stop and reflect (Porter, 2017). That is, attendees of leadership development programs have a chance to focus on who they are as a professional, what they want to achieve, and how they are going to get there. It is easy for busy professionals to think that they do not have time to attend a day-long seminar or a 3-day program. But researchers must invest in themselves just as they would a piece of scientific equipment.

We also encourage researchers to build a leadership library—find books on leadership lessons and strategies that resonate with them and try adopting some of the practices. Researchers should also consider a leadership coach—coaches provide support and advice for navigating challenges and achieving professional goals. Or enlist help from someone with a reputation for being an outstanding mentor or lab leader. As the Exemplars note, do not be afraid to ask for help and guidance.

3. **Invest time.** From the time they enter university to the time they become independent investigators, most researchers invest 12 or more years into studying and doing science. They think nothing of spending several months writing a grant application. Achieving the aims of a large research project may take 5 years or more. Building relationships and honing leadership ability similarly require a significant time investment. It takes time to listen to others. It takes time to communicate to members of one's team the importance of research integrity or the reason for your passion about a topic. It takes a commitment of time to identify and adopt strategies to fend off burnout. It takes time, arguably a

lifetime, to fully develop and refine the habits and strategies that allow one to be an effective professional and leader.

We heard Exemplars say, "…be in the lab…work with your own students…don't just sit in your office…" We also heard, "We'd just go, stop what we're doing, go have coffee…bring along graduate students…" Exemplars talked about informal, creative interactions that supported a "…less structured exchange of ideas" than traditional meetings. Others said "…you have to know yourself, and if you find yourself being burned out…then go kayaking…" and "…make sure you do something else other than science once in a while."

Researchers would not think twice about investing an hour in reading an article that came across their desk about a surprising finding or a new technique. But, an hour to have coffee with graduate students to get to know them and their goals? A lunch with students and staff to celebrate a recent accomplishment? An afternoon away from the office to enjoy a hobby?

It can feel challenging to commit to these opportunities for interaction and self-care. Not all investments in relationship building lead to lasting partnerships. Self-care can feel senseless when there are papers to write and emails to answer. These facts offer an especially tempting justification not to invest the time for those of us who feel most comfortable behind our computer, safely tucked in our office for hours on end. Researchers should remind themselves the only way not to miss out on a fruitful collaboration is to commit the time and see how it turns out. Inside their own teams, they should remember investing time in good relationships fosters a positive work environment (Paterson et al., 2014; Spreitzer et al., 2012). In turn, team members work better together, saving time when it comes to effectively executing work tasks. When it comes to allowing themselves time to think or reflect on what they love about their work, researchers should remember they must sustain their enthusiasm for an entire career.

4. **Adopt an experimental mindset.** Try different approaches. The most powerful leadership development comes from learning through experience (Ashford and DeRue, 2012). Every day offers the opportunity to learn something about yourself or leading your team. Reflect regularly on what is working well, and do more of it (Nesbit, 2012). Also, evaluate what is not working well, and try new strategies. Do you feel that team meetings are not running effectively? Perhaps you feel your strategy for onboarding new members could more effectively acquaint them with lab procedures and your lab's culture. Maybe you find yourself frazzled at the end of each day and might benefit from restructuring your schedule. Try a new approach and see how it goes. Adapt, adjust, and reevaluate. Scientists are trained to experiment, and they are fast learners. Apply these skills to leading your research team and managing your professional life.

    As you do this, do not forget to ask your colleagues for advice and lab members for feedback and act on their comments. Perhaps they have ideas for more efficient meetings. Maybe the lab member most familiar with lab procedures

could develop a written, standardized protocol for onboarding new members. Involve lab members—in doing so, you will be helping them develop their own leadership skills. And, when setbacks or problems arise, these experiences are especially ripe for examination and experimentation. Failures and setbacks are the best opportunities for learning, particularly for learning about oneself and leadership.

Conclusion

We imagine that researchers did not set out to be scientists because of their love of either communicating persuasively or staffing and leading a research team. We expect most researchers are not encouraged to self-reflect or discover strategies for self-care so they may actively cultivate their passion and resilience. Nevertheless, researchers are the executives of research. We, like the researchers we spoke with, encourage them to attend to these important "soft skills." To do so, we think that researchers must set the goal, participate in leadership development activities, invest the time, and adopt an experimental mindset.

Acknowledgments

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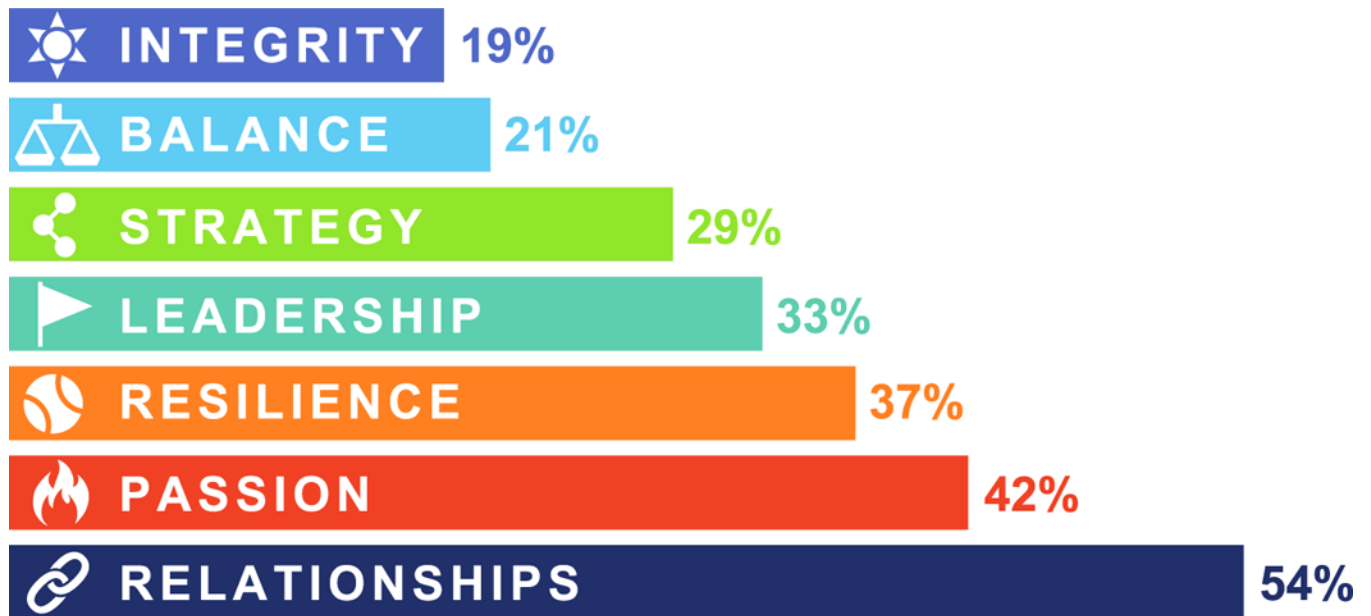
Figure 1. Keys to Success According to Research Exemplars:
Percentage of 52 Exemplars mentioning the following themes:

When asked for advice for early-career researchers, Exemplars emphasized multiple themes which were organized into 7 Keys to Success. Keys represent themes mentioned by 10 or more Exemplars. Percentages do not add up to 100% as most Exemplars offered more than one piece of advice.

Table 1.

Explanation of the 7 Keys to Success in Research

The Key	Definition	Example Quotes
1. Relationships	Cultivate relationships and draw strength from others. Build a rich network of great colleagues, and be willing to learn from others.	"…listen to your more experienced faculty colleagues…keep the best things that you can from everybody, and don't be shy about that. Put your ego on the back burner…assimilate what you learned into what works for you." "…never be afraid to say I don't know, and always ask for help… Never try and go solo on something if there's an opportunity to bring others in and collaborate."
2. Passion	Do research you are passionate about and find joy in your work.	"Do something that makes your heart sing. Do research that you're passionate about, and that makes you want to get up and go to work every day." "…follow your passion…if you believe that your research is interesting and worthwhile, and you're passionate about it, you will find a way to make it more relevant and useful and challenging, and it is that depth and rigor in your work that's going to bring it to a very high level."
3. Resilience	Be resilient in response to criticism and failure. Learn from failures and do not take criticism personally. Believe in what you are doing.	"…when you have negative reviews on a paper or proposal…use those as learning experiences and [don't] take that personally….learn what you can from them as a way to improve and make yourself stronger." "You have to deal on a regular basis with rejection of papers, of grants, of your ideas, and you have to believe in what you're doing…see through those hurdles…. It has to come from your heart."
4. Leadership	Be an engaged, respectful team leader. Be deliberate about building your team, interact with them regularly, and take time to listen.	"Communicate, communicate, communicate with every single person that you interact with…. Treat people how you hope people will treat yourself. It is that simple…." "Listen—sounds kind of obvious, but a lot of senior people, because they're good and successful they tend to talk a lot. So listen, respect everyone in the lab, and communicate…."
5. Strategy	Stay focused, make strategic decisions with your goals in mind, and advocate for yourself.	"Focus…. There's just not enough time in the day…so learning to close your door, say no. That's the hardest part I think for early career people." "…don't box yourself in. Think more about how can I set myself up to have resources today and resources two years from now and resources five years from now, and resources ten years from now?"
6. Balance	Have interests outside of work and give yourself time to think.	"Leave time for yourself to relax and have a life outside of work I think helps you be more productive and happier at work…. Even if it feels like you have too much to do and you shouldn't be doing anything else but working." Try, every morning, to just remind yourself to try and create balance."
7. Integrity	Commit to the required hard work, be honest with yourself, stay humble, and remember that cutting corners never pays.	"There is a natural tendency to get the work out as quickly as possible and reap the glory from that discovery. But just be aware that we humans have a tremendous ability to deceive ourselves…. When you do put it out, you want it to be as solid and strong as it can be." "In the end, just sort of stay grounded…stay humble throughout the process…it goes back to…integrity."