AMERICAN Scientist

ETHICS

Mentor vs. Monolith

Finding and being a good graduate advisor

Mohamed Noor, Caiti Heil

Prof. Mohamed Noor and Ph.D. student Caiti Heil agreed to work together on an *American Scientist* essay about graduate mentoring. They independently framed outlines and brought them together for a first meeting. Mohamed's essay was more focused on being a mentor and less on choosing one, whereas Caiti's was more focused on how to choose and work with a mentor without much detail about what makes a mentor successful. As a result, they have chosen this non-standard "conversational" format for conveying their thoughts.

Importance of Choosing Wisely

Caiti: Choosing an appropriate mentor is paramount to your success as a scientist: Your whole career is about mentoring and being mentored. This mentoring probably started with experiences that made you want to become a scientist—activities with a great high school science teacher, for example. Then, of course, part of one's training as a Ph.D. student is how to become a mentor, which you learn both by helping others and from watching your advisor.

Mohamed: … including from his or her mistakes! When I started as a new faculty member, I incorporated some strategies I observed from my past three advisors (undergraduate, graduate and postdoctoral), but I picked and chose from among their approaches to form a mixture that felt right to me. I also developed some strategies of my own. Still, very few of us receive any sort of training in mentoring, so we learn almost exclusively from our experiences (good or bad). The analogies to parenting are hard to avoid—we even build family trees of "relationships" based on who trained with whom. The U.S. National Science Foundation (NSF) declares that thesis advisors are a conflict of interest, meaning you can never review the grants by your former advisor or your former students. Amusingly, although current spouses are explicitly disqualified from reviewing your grant proposals, your ex-husband or ex-wife could technically review your grant after several years have passed. You can never change who your advisor was after graduating, though. So, by NSF rules, you're closer to your current or former Ph.D. advisor than to your spouse!

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Responsiveness/ Accessibility

Caiti: You can never escape your advisor! That's why, when you are choosing a graduate advisor, it's *very* important to think not *just* about the research topic but also the relationship that you'll be building or enduring for 5 to 10 years, and at some level for your entire career. I don't think people realize how important a decision it is until later in their graduate career—it shapes your personal happiness and that of those around you.

One of the biggest things new Ph.D. students fail to consider is *the need for accessibility* of the potential advisor. You might think that you won't mind having an advisor who travels nine months of the year, but inaccessibility can be agonizing when you're trying to get comments on a manuscript or set up a committee meeting. An advisor from whom you can get immediate responses and feedback is worth his weight in gold.

Mohamed: I agree. Obviously, it's crucial to pick a laboratory that is doing research that *really* excites you, as you will be working on it for years to come. However, the personal aspect of training cannot be ignored—some people want a lot of attention and structure, while others want to be left to figure things out on their own. Responsiveness and accessibility are crucial for everyone, and a failure in communication is the biggest cause of all graduate student strife. It's incumbent upon mentors to make their advisees know that they are a high priority rather than a "whenever I have time" burden, and it's incumbent on advisees to be responsive to advisor's comments and communications. I really appreciate students who regularly reply to e-mails within 24 hours, even if the response is just, "Got your e-mail—thanks—will reply in more detail later."

Caiti: Similarly, I think you can get a sense of whether a potential advisor will be responsive right when you first e-mail them and ask questions about their lab. If you get a rapid response that is enthusiastic and encouraging, then you can be pretty confident that they are interested in hosting you and that they won't leave you hanging. If they don't write back after multiple contacts, then you can pretty safely assume they're not going to be much more attentive and responsive if, or when, you were to join their team.

Style

Mohamed: Mentoring styles can vary greatly—some advisors are very (oppressively?) hands-on, whereas others are completely hands-off. Some expect their students to completely develop and fund their own research projects, whereas others expect their students to work exclusively on "aim 3 of their current grant" and don't have them develop an independent project. There are certainly continuums between these extremes, too. It's best for students to think deeply about their personal style, feel out where their potential advisors are within these spectra and choose an advisor with a *complementary style*.

Still, problems can and probably will arise. For example, some advisors speak very informally with their students, saying whatever passes through their mind. Such interactions may be acceptable to some students, but other students may be hurt when advisors fail to fully consider the gravity of the words they use. Often new advisors still feel like "one of the lab," and don't realize the ramifications of either getting too close or of casually saying something perceived as quite critical. Such speech can be analogous to swinging around an invisible hammer with their words—what an advisor perceived as passing comments might upset a mentee for weeks.

Caiti: Current or former students can help a prospective student identify these kinds of problems and understand the lab's team dynamics. For example, are the people in the lab generally happy? Are there frequent conflicts, and how are they resolved? Do they feel the research is collaborative or competitive? Potential advisees need to really consider what current and former students say—it's easy to dismiss concerns as minor, but if many people raise the same concern, then it warrants serious contemplation.

Mohamed: I think it's essential to talk with multiple people in those roles, as a single person may have had an unusual experience, but broader patterns within the comments can give a more unbiased assessment. Remember, every relationship between an advisor and mentee is unique—advisor attributes that some mentees find unacceptable may be neutral or perhaps even desirable to other mentees. Some mentees really don't want an advisor checking in on them every other day, whereas others seek out advisors multiple times a day.

Expectations

Caiti: I appreciated getting a list of expectations from my Ph.D. advisor when I started in the lab. Specifically, it helped me to know what hours and days I was expected to work, how much stipend support and extramural funding I was expected to obtain for my research and how much time I should devote to teaching and departmental service. Most students don't get such a prepared list, so it's helpful to ask about these issues directly. It's also useful to ask questions such as how will authorship be determined, and can projects initiated by a mentee in the laboratory leave with them when they graduate. I honestly had not thought about these things at all before I arrived, and I know many of my peers had problems resulting from *expectations misaligned with those of their advisor.*

Mohamed: It's incumbent upon me as an advisor to make my expectations clear, since I am the one who is not new to such relationships. Like me, *all advisors presumably were once mentees*, so we advisors have experience with the other side. A good advisor makes time to talk with all of their mentees, and the amount of time will vary with each student's need (for example, upcoming deadlines) and current stage (for example, a student may need more one-on-one time with the advisor initially). The advisor should give the mentee an accurate assessment of the progress and potential of the mentee's research projects, as well as the individual's overall preparation for a future independent career. This should be done regularly, not just on request.

To be a good advisor, I am also responsible for training and serving as a role model. For training, I need to help students become skilled at identifying and evaluating research projects. I need to help them learn how to dissect tough problems and develop a sense of what projects are or are not worth pursuing. This will require one-on-one time and extensive communication. I need to be open to learning and change, both in response to my students and in general. Finally, as a role model, I should lead by example. It would be disingenuous of me to spend all evenings and weekends with my family but simultaneously to expect my students to forgo their families and slave in the lab at all hours. Spending time with my family is vitally important to me, and I realize the same is true for my students.

I really want my students to communicate their expectations of me as well. I know that can be challenging or uncomfortable, but I can be far more effective as an advisor if my students clearly express their needs, wants and desires for change in the mentoring relationship. Even if the student's request is unrealistic (for example, daily hour-long meetings), I can present alternatives that may satisfy the need within the framework of what I can provide.

Caiti: That's what any relationship is—a two-way street. Ultimately, and perhaps counterintuitively, the most important thing you can do to enhance your success in science is to *cultivate your communication skills.* You have to communicate with your advisor, you have to communicate your science in publications and grant submissions, and you have to communicate orally at conferences and job interviews. It's essential to work on succeeding at that from the beginning by communicating your needs and wants clearly in the advisor-student setting.

Mohamed: Exactly. The student's needs will change over the course of the relationship, too, and it can be challenging for the advisor to adapt without a lot of feedback. The advisor needs to keep that in mind, and serve as a continuing resource and role model throughout the mentee's development.

Additionally, the advisor has to be looking to the mentee's future, with their input. Not only should the advisor help with their current research, but the advisor needs to help the mentee cultivate connections and directions for the future. Again, the advisor needs communication from the mentee to know how to do this effectively.

Career Development

Caiti: Networking isn't just for the business world—we need to meet scientists who will be future colleagues, collaborators or even postdoctoral research supervisors. It was particularly intimidating for me to walk up to "famous" scientists, introduce myself and ask questions or advice from them. One of the most helpful experiences for me has been making lists of people to meet at upcoming scientific conferences, and then having my advisor facilitate some of these introductions if he's going to the same conference. Doing this a few times helped me become more comfortable initiating such introductions on my own.

But I know an even more challenging problem is what to do if you don't want to follow the same career path as your advisor and introductions at such conferences are not forthcoming. Good advisors discuss multiple possible careers and encourage students to develop skills suited for diverse paths.

Mohamed: This is a tough one for advisors, because most of us were trained in and pursued only a single path. We have no idea how to get jobs in industry or government or other areas. Many of us have only ever been at particular types of universities, so we may not even know how to approach different academic routes. That said, we should not presume that all our students want to be clones of us—it's becoming increasingly clear that there won't be enough positions or funding for that to be possible anyway, even if we erroneously presumed it was their desire to do so. A good advisor will *advise to the extent of their own knowledge,* and will help students *build connections* to others who can advise them on that with which they are unfamiliar. Advisors need not feel like they are the student's only resource.

Troubleshooting

Caiti: Invariably, some problems will arise in the advisor-student relationship, and given the role difference, students will certainly experience a *feeling of powerlessness*. They will be uncomfortable bringing their concerns to the advisor, and they won't know where else to turn if the problem is not easily resolved.

Mohamed: What are you saying, Caiti?

Caiti: Oh, nothing. But it seems that a lot of problems with advisors start as issues between lab members that then become issues with the advisor when the advisor mismanages resolving a conflict or disagreement. Ideally, the advisor should not show any favoritism and hear everyone out. Ultimately, he may come down on one side of a disagreement, but it's essential that everyone's perspective be considered. Everyone should feel that the advisor is looking out for their success and well-being, as well as the success of their projects. But there will be times that problems will feel unresolved, and students sometimes need to vent about their advisors to their friends.

Mohamed: Advisors also need to vent, but *it's essential for advisors not to vent to (or in front of) students* about other students. Instead, faculty can strategize or rehearse difficult discussions with their colleagues or spouses, and get "reality checks" on whether they're being reasonable. As people often say, it's good to sit on angry e-mails for a day or longer before sending them, too, and maybe even get a colleague or spouse to look it over. I've certainly edited a large number of e-mails by my colleagues that eventually went to their students, and they've edited several of mine!

However, even with many precautions, problems will arise that venting alone won't solve. Students do have means for recourse, even if they may feel uncomfortable. The best first step for students is to attempt to *discuss issues with the advisor directly.* As with any relationship, communication is crucial, and tackling things early can prevent huge blowups or hurt feelings later. I served as a director of graduate studies for a degree-granting program, and students would often complain to me about their advisors. However, when I'd ask these students if they'd talked with their advisors about the issues, they'd often reveal that they had only discussed them very indirectly despite being quite bothered. That said, *the power differential is huge,* and advisors should appreciate that students may not be completely forthcoming about concerns.

The thesis committee is the second line of defense, since these people are partially responsible for protecting the student and should know something of her history. The third place to go with concerns is the department or university administration. Students should keep in mind that, aside from extreme problems or actions that are arguably illegal, they should be sure to have exhausted the first two before going this route.

Mentor versus Advisor

Mohamed: As a student, you can't rely on a single mentor for everything, so you'll need to seek mentors beyond the advisor. You can have different mentors for different facets of your training. For example, someone can be your go-to person for advice on teaching versus a particular career option versus different aspects of their research. After finishing graduate school, students will be in positions where they may not have a formally assigned "mentor," and they'll have to create and foster relationships among colleagues to play these mentoring roles for them. For me now as a professor, I go to one colleague for advice on running the lab, but I go to a different colleague when I want to bounce ideas related to teaching.

Additionally, former advisors continue to serve in mentoring roles, but students may be surprised at the high frequency with which they are solicited to provide mentoring advice back to their *former mentors.* Ultimately, we know we've succeeded in our jobs when our former students serve as active colleagues, even if in a different career or role.

Caiti: Usually we think of age as being important, but in reality, you get some level of mentoring from others who are the same age or even younger.

Mohamed: Well, thanks Caiti—this was fun! I look forward to receiving more mentoring from you in the future. I'm really glad that you and I don't have communication problems.

Caiti: Um, well, actually Mohamed, there is something I wanted to talk about with you….

Mohamed: Uh oh….

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