

Mentoring Across Identities in STEM

Overview

Mentoring is central to who we are as a scientific community. We work to foster the intellectual development of undergraduates, graduate students, postdocs and other trainees. In STEM, beyond their scientific interests, mentees come into labs and classrooms with other identities that can shape their development as a scientist and as a professional. The goal of this document is to help mentors consider the many ways in which identities can impact scientific development. However, it is important to recognize that not everyone with the same identity faces the same obstacles. Ultimately, the most important thing that a mentor can do is provide a mentee an environment in which they feel supported and included. A mentor needs to open up channels that allow a mentee to identify and express their needs. This document is merely a beginning, and additional resources are listed at the end.

What is Mentoring?

Mentoring is a collaborative learning relationship. The primary goal is to help mentees acquire and develop the essential skills needed for their chosen professional path. Mentoring is shaped by one's own experiences. Mentees will require different things at different times, and mentors will vary in their capacity to meet a mentee's needs. A successful mentor-mentee relationship is dynamic and reflective.

Mentoring can have profound impacts on mentees, both good and bad. At its best, a mentor-mentee relationship provides a life long support structure for mentees to develop intellectually and professionally.

What is Identity?

A person's identity includes how they define themselves but also how they are viewed by the world. Identities are complex, intertwined and not static. Some identities are visible and others are not. A person may define their identity based on race, ethnicity, nationality, level of education, socioeconomic status, sexual orientation, gender, age, religious beliefs, family status and so much more. Each mentee is developing their science identity, which is how they identify as a scientist. Our science and professional identities are just part of who we are and are shaped by other identities. No one identity supersedes any other. Intersectionality is a term that is sometimes used to express the combination of identities for an individual or group of people.

Why Does Identity Matter in Relation to STEM Mentoring?

A traditional mentoring model is that of a master and apprentice, in which the mentor is passing along specific professional skills to the mentee. This skill-based model is largely lacking in

nuance, requiring mentors only assess a mentee's science-related needs and then fill in the blanks. It does not require any consideration of identity. Everyone, however, has identities that shape how we view the world and how the world views us, including the world of science. There are many ways that a mentee's identities may influence the development of a mentee's science identity and their future scientific contributions (Box 1).

Box 1. Some of the many ways that a mentee's identities can shape the development of their scientific identity and contributions to science in the future.

Identities may...

- alter interests and perspectives.
- lead to a desire for more or less community-engagement as integral to scientific practice.
- influence how one addresses a scientific problem, understands a collaboration or perceives the science of others.
- shape how a mentee communicates and what they are comfortable communicating.
- influence a mentee's ideal learning style.
- present challenges (see Boxes 2 and 3) that a mentor can help a mentee overcome.
- influence the support that a student needs in order to be successful in the lab.

Science loses if we only select for a narrow range of identities. Science also loses if we only select for mentees who are able to overcome challenges on their own.

The practice of science can be difficult for all mentees, but the experience can be more difficult for mentees who face obstacles due to their race, ethnicity, nationality, sexual orientation and identity, disability, religion, age and socio-economic background (Boxes 2 and 3). From the perspective of the mentee, recognizing this can be an important step in supporting their success. From the perspective of science, recognizing this can help break down barriers that could impede science, a highly collaborative endeavor.

Box 2. Types of obstacles frequently faced by students from underrepresented backgrounds. Many of these terms and phrases are being increasingly used in academic discussions. These descriptions provide you a basis to develop your own understanding.

Implicit Bias. Implicit bias refers to the attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner. If unconscious assumptions are made before learning a mentee's competencies, mentors may use a "cookie cutter" style to mentor an entire group of scholars. This style may not be aligned with a mentee's needs. Negative unconscious bias may appear in the mentor-mentee relationship as harsh treatment or penalties that specifically relate back to the student's identity. This can cause the mentee to need to work more in order to prove these unconscious assumptions to be wrong.

John Henryism. John Henryism refers to the phenomenon of coping with prolonged stresses, such as discrimination, by maintaining unsustainable, unhelathy, and extreme levels of effort. Mentees from underrepresented backgrounds may try to work twice as hard in a hope that this will allow them to overcome obstacles. This can have accumulating physiological and psychological costs.

Impostor Syndrome. Although common in scientists of all identities, mentees who are members of minority groups are more prone to feeling less confident about their intellectual abilities and capacities, despite their successes. This can be due to factors like: experiencing discrimination, having language barriers (e.g., for international students), or due to cultural factors that impact the way they perceive themselves. All this can exacerbate feelings of "impostorism" that are ubiquitous in highly competitive, academic environments.

Lack of Senior Role Models with Shared Identity. Students from underrepresented backgrounds may find it harder to find a supportive community that understands their perspectives, and, in particular may have few role models and mentors that share their identity.

Stereotype Threat. The feeling of anxiety about performing in a way that reinforces a negative stereotype about your identity is a challenging burden for mentees from stereotyped groups

Aggressive Acts. Aggressive acts unintentionally or intentionally translate verbal or non verbal communication that makes the working environment uncomfortable.

- *Macroaggressions* are exhibited when a verbal or physical act is deliberately meant to harm or hinder the ability of scholars with a specific identity. Macroaggressions can be perpetuated both by individuals and by institutions.
- *Microaggressions* are acts that intentionally or unintentionally communicate a harmful or negative attitude toward a scholar's identity. *Passive aggression* is the act of promoting hostility or confusion to a scholar based on their identity. Although there are many ways in which passive aggressive acts may arise, in a learning or research setting, these acts can arise in the form of leaving harsh notes, procrastination, or deliberate avoidance

aimed at a scholar or a group of scholars based on identity.

- *Microinvalidation* is an additional aggressive act that uses negative verbal communication that excludes a scholar based on their identities. In many cases microinvalidation appears as an unconscious verbal compliment but to the person receiving the message, it is an insult.

A Need to Represent a Community or Identity. Students from underrepresented backgrounds may place enormous pressure on themselves to represent those from their community or background well. In particular, they may worry that any failure could hurt not just themselves but the acceptance of others like them.

Lack of Social, Cultural, Economic and Academic Capital. In sociology, “capital” refers to how one’s experience (or the experience of their close family members) can be used to make gains in society. Some mentees will more easily integrate into the academic setting because of their capital. Others will find it harder to integrate because of a lack of capital.

Pet-to-Threat Phenomenon. “Pet to Threat” is a phrase most commonly used in relation to Black women in the workplace, in which companies and organizations groom the women to succeed, only to then have individuals see them as a threat as they gain more confidence in their roles.

Box 3. Examples of obstacles faced in relation to particular identities. These examples are not exhaustive, and it is important to consider that not everyone with the same identity faces that same obstacles.

Age. If you picture the typical undergraduate or graduate student, you likely see someone who is in their early twenties. Students who are older may find it challenging to find a group of peers.

Family Status. Mentees can have situations in which they may be a caregiver either of their parents, children or in some cases siblings. They can also be the primary source of income in their homes. Thus, their scientific training and education is not their only workload.

First Generation Status. First Generation (FG) mentees may have less awareness of expectations and feel less comfortable asking for clarifications of questions. FG mentees may face self-imposed pressure to represent one's family, and to honor their families' sacrifices.

Gender and Sexual Orientation. Gender is the range of characteristics pertaining to, and differentiating between, masculinity and femininity. A person's gender identity refers to a person's sense of their own gender. Sexual orientation refers to a person's identity in relation to the gender or genders to which they are sexually attracted. These identities are multifaceted and complex, and some genders and sexual orientations are visibly underrepresented in STEM disciplines, in part because many LGBTQ scientists remain closeted, a phenomenon that reflects the pervasive heteronormativity of our society. Mentees of a minority genders or sexual orientations may face challenges in terms of not having support from their family or other members of society. They may find a lack of role models of their identities within their discipline. Transgender mentees may face particular challenges in settings where they must share public facilities (e.g., sharing hotel rooms when attending conferences, restrooms, etc.).

Health and Differential Abilities. Many mentees face physical and mental health challenges. Mentees may also be differently abled physically (e.g., hearing impaired) or may learn or interact with their environment differently (e.g., Autism, ADHD). It is important to remember that many chronic illnesses or differential abilities may be "invisible" and yet affect work. Mentees with long-term conditions may have a better understanding of what they need but may be hesitant to ask a new mentor.

International and Immigrant Trainees. International students, and particularly those who have recently come to the United States, may feel isolated because of cultural differences or, in some cases, language barriers. International students also may have less familiarity with U.S. academic systems, including their structure and what is valued. In addition, international and immigrant trainees can face economic and bureaucratic challenges related to immigrating, and stress associated with uncertainty about visa status. This stress is further exacerbated for undocumented immigrants and their families.

Political Orientation. A common narrative is that academic institutions are liberal havens, leading to the automatic exclusion of mentees who may be more conservative. Mentors should be aware of the language that they are their research communities use in regards to political events.

Race and Ethnicity. While there have been substantial efforts to increase the racial and ethnic diversity of the scientific community, many races and ethnicities are underrepresented at all training levels. This underrepresentation can lead to many of the phenomena listed in Box 2, almost all of which can increase stress and doubt.

Religion. A majority of persons in the United States believe that science and religion are at least sometime in conflict. Such perceptions may cause mentees whose religion is central to their identity to feel isolated in STEM settings. Mentees may feel uncomfortable having to follow their religious practices (e.g., daily prayer, avoiding alcohol) when this is not common in the lab community. Furthermore, mentees whose religion is visible based on how they dress or act may face aggressions.

Socioeconomic Status. Mentees facing economic hardships may experience increased stress outside of the training environment as they navigate financial challenges of their own and of their family. Mentees of lower socioeconomic status may have a harder time integrating into affinity groups due to the costs of social events. Mentees may find the costs of conferences and workshops prohibitively expensive if they must cover the costs prior to reimbursement.

Suggestions for Mentors

General Suggestions

1. **Be reflective and consider how your own identities shape your mentoring.** Take the time to reflect on your abilities and limitations as a mentor, and your perceptions of your mentor-mentee relationships. Furthermore, you should consider how your own identities and privileges shape your understanding and how they have shaped your career and perspective. This gives you a perspective from which you can advance your mentee-mentor relationship(s).
1. **Be aware of obstacles** that mentees may face (Boxes 2 and 3), and recognize that many identities are invisible.
2. **Be careful of assumptions.** Do not make assumptions about your mentees' obstacles based on identity. For example, one queer mentee may feel that recognition of their identity critically shapes their development as a scientist, whereas another queer mentee may perceive their queer and scientific identities as not influencing one another. Work to develop an environment in which a mentee feels included and has opportunities to express their needs.

3. **Everyone benefits from explicit expectations.** One of the greatest barriers to a successful mentor-mentee relationship is poor communication. Challenges with communication can be exacerbated when mentors expect mentees to have the social and cultural capital to understand unspoken rules or expectations. For example, research in classroom settings has shown that first generation students strongly prefer that their instructors make expectations explicitly clear (see Resources). This likely applies to laboratory settings as well.
4. **Everyone benefits from some flexibility.** Anticipate what situations may require more flexibility and what flexibility you can and cannot grant. Situations that may require flexibility include family care, health challenges and mentees' commitments to outreach to their communities.
5. **Know your own limitations.** Being supportive does not mean that you need to know everything or that you need to solve every problem. Be explicit in your support and be willing to listen. Be aware of other resources to help.
6. **Be open and receptive to feedback from your mentees.** Your mentees are constantly getting feedback from you. Take the time to ask your mentees for feedback and about what they would like to change.
7. **Be thoughtful when discussing identity.** Talking about identities can make students feel vulnerable. While ignoring differences may increase isolation, focusing on identity, particularly with mentees with whom you have not yet established trust, may increase their vulnerability and could exacerbate a sense of lack of belonging. Carefully consider when and how to bring up questions related to identity. Some suggestions are provided in Box 4.
8. **Remember that mentoring is a dynamic process.** Many things change over the course of a mentoring relationship. For example, identities change and the comfort level of the mentee to confide in the mentor can change. Mentors should maintain open communication and an ongoing conversation that allows mentees to share identities, and that allows mentors to support the mentee on a long-term basis.

Building an Inclusive Community

1. **Be intentional about including everyone,** recognizing that due to biases, people of some identities will not be included to the same extent. As one example, members of your lab may be less likely to invite a student with family or an international student to a social event, assuming that they would not enjoy it. Such decisions can create a sense of isolation or lack of belonging for students from underrepresented backgrounds.
2. **Extend your social capital to include diverse scholars.** Marginalized scholars are less likely to feel that they belong in science. As a lab, be intentional about reaching out to students and scholars from underrepresented backgrounds.
3. **Be an active listener.** While mentors are often stretched in many directions, when possible, try to be as available and approachable as possible. Pay attention to changes in behavior or work quality that may reflect changes in a mentee's personal circumstances or well-being.

4. **Support well-being.** Students of all backgrounds face challenges, and those from underrepresented backgrounds are likely to face more (Box 2). Furthermore, there is increasing recognition of growing rates of depression and anxiety in student populations. An inclusive environment is one that supports health and well-being. This includes you needing to model appropriate work-life balance, and to encourage members of your lab to take care of their physical and emotional selves.

Clear Communication and Expectations

Establishing and practicing clear communication requires investments by both mentors and mentees. Communication strategies may change over the course of a mentoring relationship, as mentees' needs change.

1. At the outset of a mentoring relationship, it is important to identify preferred methods of communication. If needs change, both mentors and mentees need to make this clear.
2. Formal documents can often serve as useful tools on which to scaffold clear communication and expectations. There are many types of mentor-mentee documents, and different mentors may prefer slightly different approaches. Examples of mentoring documents include:
 - **Lab Philosophies/Manuals.** These documents are designed by the PI to provide an overview for all team members. Some sections may be specific to certain groups in the lab (e.g., undergraduate students, postdocs, etc.) but most should be relevant to the entire lab community. Lab philosophies often contain a section on the importance of inclusiveness in the laboratory, and may contain sections addressing work-life balance and mental wellness.
 - **Mentoring Compacts.** These documents are tailored to define expectations of both the mentor and mentee. They are meant to facilitate open dialogue. The word "compact" is preferred over "contract" as contract may imply a focus on the consequences of a student not meeting expectations, rather than a non-punitive, two-way commitment between mentor and mentee. Compacts should be referenced and updated regularly as a student's training stage changes or when a student faces particular challenges that will ultimately require changing expectations.
 - **Writing Contracts.** One big challenge that scientists often face is meeting writing deadlines. Repeatedly missing writing deadlines, or pushing off writing such that there is no time for students to receive feedback on their written work, can be a huge setback for students. A writing contract between a mentor and a student sets out specific expectations about meeting writing deadlines.
 - **Mentoring Roadmaps.** Mentoring roadmaps refer to a guided process by which mentees identify their goals and sources of support for these goals. This information can be shared with a mentor in order to guide a conversation, and can also help a mentee identify when they need different mentors to do different things.

3. **Explicitly plan for conflict.** The needs of mentors and mentees may not always be in line. Before reaching a point of tension, there should be a clear plan in place of how disagreements will be handled.
4. Since mentor-mentee relationships are dynamics, **communication needs to be dynamic** as well. Regularly assess what is working and not working in terms of communication.

Box 4. Questions to Facilitate Mentor-Mentee Relationships

Questions to ask yourself

- What do you envision as your role as a mentor to your trainees?
- Does this differ based on whether a student is an undergraduate, graduate student or postdoc? Does this differ in the laboratory versus in the clinic?
- What are your limitations as a mentor?
- How can you best define to your mentees what you can provide them in terms of mentorship and what you cannot?
- Do you know of resources that can help your mentees when they need something that goes beyond what you can provide as a mentor? What don't you know that you need to know?
- How does your own identity shape your mentoring?
- What aspects of your identity do you share with your mentees? What do you feel comfortable sharing?
- If you pay attention, do you begin to notice biases that you have? How might these influence your mentoring?

Questions that may facilitate discussion with new mentees

- What do you want a mentor to be? What do you want a mentor to provide?
- Is there anything that you feel that I should know about you that can make me a better mentor for you?

Questions that may facilitate discussion with mentees with whom you have an established relationship

- What am I doing that supports or does not support you as a person? What am I doing that supports or does not support you as a developing scientist?

If a student brings up concerns related to their own identities...

- What should I know?
 - I want to help you but I am not sure I know how? What might help?
 - Would you like me to connect you with resources on campus that can help?
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Resources

General Guides for Mentors

- [How to Mentor Graduate Students: An Introduction](#). A guide from the University of Michigan. *One of the most comprehensive University graduate student mentoring guides available.*
- Center for the Improvement of Mentored Experiences in Research (CIMER)'s [Entering Mentoring](#). *The basis for many national mentor training efforts.*
- [Nature's Guide for Mentors](#). *A comprehensive portal for mentoring related articles and resources.*
- The National Academies [The Science of Effective Mentorship in STEMM](#). *A recent publication with up to date references.* There is an associated [podcast](#).
- [Mentor Competency Assessment](#), from the University of Wisconsin. *A quick tool to help you reflect on your own mentoring style.*
- [Crafting Communication Tools to Facilitate STEM Mentor-Mentee Communication](#). *This resource provides example documents and links to other resources.*
- [Ten simple rules for building an anti-racist lab](#).

Mentoring Across Identities

- Chapter 3 of [The Science of Effective Mentorship in STEMM](#), *which focuses on mentoring across race, ethnicity, sexual orientation and gender identity.*
- [SABER's Striving for Racial Justice in Academic Biology Series](#). *This excellent talk series focuses on many aspects of academic inequity and inequality. Videos are available for each talk.*
- [Language Matters: Considering Microaggressions in Science](#). *This article has some helpful, everyday examples of microaggressions.*
- [LGBT+ Inclusivity in Physics and Astronomy: A Best Practices Guide](#), *a 2018 guide highlighting the challenges that LGBT+ students face and recognized best mentoring practices.*
- ["Is that paper really due today?": Differences in first-generation and traditional college students' understandings of faculty expectations](#). *While focused on undergraduate rather than graduate students, this research article provides helpful insight for all mentors into the unique challenges faced by first generation students*
- University of California's Guide to [Promoting Student Mental Health](#)
- [A Toolkit for Increasing Accessibility in Academia](#). *This includes resources for both mentors and mentees, and focuses particularly on resources for graduate student accessibility.*

Emory-Specific Resources

- [Emory Office of Diversity Equity and Inclusion](#). The office provides a document on their website about learning about race, as well as other resources specific to the Emory community
- [Atlanta Society of Mentors \(ASOM\)](#). A platform to support the training in STEM mentoring. ASOM runs yearly workshops for faculty and support training at postdoc and graduate student levels as well.
- [Student Health and Counseling Services](#)
- [Office of Accessibility Services](#)
- [International Student and Scholars Services](#)
- [Emory Campus Life](#)
 - [Office of International Student Life](#)
 - [Office of Lesbian/Gay/Bisexual/Transgender Life](#)
 - [Racial and Cultural Engagement at Emory](#)
 - [Supporting Students During Crisis](#)
- [Center for Women at Emory](#)
- Emory's [Safe Space](#) training, a 3.5 hour training designed to help all faculty, staff, and students provide support for the LGBT+ community at Emory community.

Contributors. This document was crafted as the result of discussion facilitated by Emory's Center for Faculty Development and Excellence learning community program. The learning community, *Mentoring Diverse Students in Lab Settings*, was led by Dr. Nicole Gerardo and Dr. Amanda James. Contributors included Dr. Leah Roesch, Dr. Michael Martin, Dr. Keira Davis and Dr. Tim Raines. Valuable feedback was provided by members of the GerDer lab.

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