

Mentorship: A Scientific Perspective #1

There is no one correct approach to mentorship, but there is a history of mentoring based on tradition, without much attention to whether the results are consistent and equally good for all kinds of mentees.



Recent research aims to close this gap, bringing evidence-based strategies into mentorship practices in order to enhance the effectiveness of mentoring for the next generation of researchers.

In 2017, the Board on Higher Education and Workforce of the National Academies of Sciences, Engineering, and Medicine formed a Committee to address this gap. The resulting report, issued in 2019, is a result of a comprehensive literature review and several listening sessions and is aptly called The Science of Effective Mentorship in STEMM. The report covers theoretical approaches to mentorship, historical mentoring practice, scholarly research into best practices in mentorship, and recommendations for improving mentorship across all STEMM fields.



This infographic series on mentorship is drawn from the findings in this report and will offer context, both theoretical and historical, as well as tips, strategies, and goals for consistent and iterative improvement in mentorship practices in medical contexts, and in particular for Physician-Scientists.

The information on the following page provides theoretical approaches to mentorship, as identified by the committee. Use the following guiding questions to think about how these might apply to your own mentorship practices:



- Which of these theoretical approaches best describe your current approach to mentorship?
- Which of these theoretical approaches do you think you might usefully draw from to enhance your mentorship?
- Do any of these theoretical approaches include questions or premises that you simply have never thought of before? Which ones? What value might these new-to-you ways of thinking bring to your mentorship style?

6 Theoretical Approaches to Mentorship



Core Premise:

Individuals are situated within systems (departments, colleges, universities)

Core Approach: Focus on how systems' cultural practices influence individual behaviors proximally and distally over time.



Ecological Systems Theory

Useful Questions:

- How do mentees navigate competing values?
- In what ways does stereotype threat emanating from the macrosystem influence mentoring practices?

Social Cognitive Career Theory

Core Premise: Individuals' beliefs are socially constructed and influenced

Core Approach: Focus on how individuals form interests and goals and make choices about careers based on learning experiences, self-efficacy, and outcome expectations

Useful Questions:

- What learning experiences in mentoring exchanges shape research self-efficacy?
- Do these differ by cultural groups?



Tripartite Integration Model of Social Influence



Core Premise: Individuals develop science identities based on orientation to rules, roles, and values

Core Approach: Focus on the process of socialization and integration into a given community

Useful Questions:

- How does mentorship shape mentees' science identity?
- Does socialization to the rules, roles, and values in STEM communities interact with mentees' racial, ethnic, and gender identities?

Core Premise: Every relationship has tangible and intangible benefits and costs

Core Approach: Focus on reciprocity in mentoring relationships



Social Exchange Theory

Useful Questions:

- How do those in mentoring relationships appraise the value of their mentoring investments?
- What are the costs and benefits of mentoring to mentors and mentees?

Social Capital Theory

Core Premise: Dominant Groups reproduce social inequality

Core Approach: Focus on access to knowledge and resources that facilitate social mobility and "fit"



Useful Questions:

- What skills, knowledge, attitudes, and values do emerging scientists need to fit into their disciplinary culture?
- How are mentees differentially evaluated based on their race, ethnicity, or gender?

Core Premise: Social interactions in a network vary by strength of relationships and the resources available in the relationships

Core Approach: Focus on how individuals are connected in a social system, for what purpose, and to what end



Social Network Theory

Useful Questions:

- Who is connected in a given mentoring network and how does that influence mentee success?
- What social networks are effective in developing mentees, and do those vary across groups?

This information is adapted from Table 2.2 of the following text:

Consensus Study Report *The Science of Effective Mentoring in STEM* (2019). The study was sponsored by the Howard Hughes Medical Institute, Alfred P. Sloan Foundation, Burroughs Wellcome Fund, and by a grant from the Gulf Research Program. Copies of the Consensus Study Report are available from the National Academies Press, (800) 624-6242; <http://www.nap.edu>. For the study's accompanying online guide see: www.nationalacademies.org/MentorshipinSTEMM.