Equity in Graduate Education **Virtual Journal Club**

(Re)Shaping the Socialization of Scientific Labs: Understanding Women's Doctoral Experiences in STEM Lab Rotations

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Summary

Lab rotations are a common structure for advanced training in STEM disciplines, and they provide early socialization experiences that may impact the identity development of graduate students as scholars. This study uses interview data from 54 women pursuing STEM doctorates to explore the gendered nature of laboratory rotations. The authors found that women's perceptions of PI mentoring styles and the climate of the lab influenced their selections of laboratories where they would conduct research for the longer term. The findings in this study add to existing research that documents how systems of oppression (e.g., sexism, racism) can become embedded in academic learning environments to shape students' graduate school experiences and professional pathways.

Key Concepts Defined

Socialization is the process in which doctoral students learn and adapt to the norms and values of their discipline and their program. Learning this cultural knowledge is one of the most important parts of graduate education, and socialization is a dominant framework for research on graduate education.

Social identity is a "person's sense of who they are based on their group membership(s)".[1] An individual's social identity "determines not only how members define and evaluate themselves but also how others may define and evaluate them".[2]

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[1] McLeod, S. A. (2019, October 24). Social identity theory. Simply Psychology. https://www.simplypsychology.org/social-identity-theory.html
[2] Colman, Andrew M. (2015). A dictionary of psychology (Oxford Quick Reference). Oxford University Press.

Grapevine effect refers to the informal channels by which advanced students communicate advice to earlier-stage doctoral students.

Agency is the "capacity of an individual to actively and independently choose and to affect change".[3]

Selected Findings

- The authors found that women used lab rotations to "test out" the climate of labs they were potentially interested in focusing their time and research. In making decisions about which lab to join for the long term, participants shared that they often had to choose between labs that aligned with their research interests and labs that were inclusive and supportive of women.
- Labmates and peers in their cohort played crucial roles in shaping the experiences of women during their rotations. Advanced doctoral students often provided support by sharing expectations and advice for navigating new lab environments and peers often provided support in managing microaggressions from faculty.
- Women's rotation experiences were heavily influenced by PI management and mentoring styles. PI management styles served as a tipping point for students' decisions

Discussion Questions

1. The findings in this study highlight how women's experiences with hostile or toxic lab rotations shaped longer-term decisions about lab selections, sometimes proving more important even than research fit. Their decisions can be read as reflections of their agency. How does, or how might, your program assess the climate for women in individual labs or other academic learning environments?

2. What do the findings of this study suggest about how we understand "fit" and "alignment" in lab settings (p. 370, 376)? When we say fit, who should be privileged? How can departments structure lab experiences so that they are inclusive and supportive of students from minoritized groups? How can incentive structures reward PI's and/or labs that create positive, supportive work environments for minoritized students?

3. Faculty are often managing competing priorities in their role as PI's, mentors, and supervisors. What types of training and support does your program provide for helping faculty in their role as mentors and supervisors?

4. The authors highlight the importance of labmates and peers in the experience women had in their rotations. What practical things can doctoral programs, PI's, and other mentors do to create learning environments that facilitate cooperation rather than competition amongst students?

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[3] Agency. (2016). In K. Bell (Ed.), Open education sociology dictionary. Retrieved from https://sociologydictionary.org/agency/

Implications

- The findings in this study illustrate how students' social identities (ie. gender and race) influence the interactions that students have with their PI's and peers in academic learning environments. Program faculty/departments may wish to consider how they can proactively create inclusive learning environments where students can be their authentic selves.
- This study highlights the important role that department or organizational level policies can play in clarifying norms and expectations of lab environments. Departments, divisions, and universities may wish to develop processes for assessing the climate of lab settings. Assessments of lab climate may help programs identify discriminatory, toxic, or otherwise problematic environments and provide grounds for communication with faculty and students about work expectations and supervisory conduct.
- PI management and mentoring styles play an important role in shaping the doctoral student experience. Faculty and departments may wish to establish practices that will provide opportunities for faculty and students to engage in dialogue about their expectations of one another. Departments may also wish to provide opportunities for faculty to engage in training and dialogue that will help them identify their management style and how it is responsive to the needs of students.