The Story of Sunny: Consequences of Faculty Mentoring for Perception of Mathematics Career Pathways

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Numerous studies have underlined the persistent gender gap in mathematics related fields as a potential focus to be explored further with respect to learner identity, self-concept, stereotype threat, and sense of belonging in the discipline (Blackburn, 2017; Lahdenperä & Nieminen, 2020). The notion of belonging was cited as an important construct to investigate and understand factors in women's decision to pursue a career in mathematics (Good et al., 2012). Therefore, we investigated the "mode of belonging" of women with regard to engagement, alignment, and imagination components using Wenger's (1998) framework. For the purposes of this poster, we emphasize the imagination component of mode of belonging to address women's perception of career pathways in pure mathematics and its link to faculty mentorship.

We adopted narrative inquiry to examine women and underrepresented students' experiences in various mathematics environments (Clandinin & Rosiek, 2007). For the purposes of the study, we selected Sunny as the focus case among five participants. The study has longitudinal characteristics since Sunny participated in one-hour interview and weekly seminar discussions in Spring 2020. She also participated in three interviews and eleven weekly reflections in Spring 2022. Sunny graduated in Spring 2022. We focus on the case of Sunny, who began as a pure mathematics major, and then later pursued a career path in actuarial science. We concentrated on the aspects that led Sunny to switch from pure mathematics to actuarial science. Sunny's case was intriguing because she expressed a passion in pure mathematics and stated that up until her third year, she was interested in pursuing a research career in pure mathematics. Sunny changed her mind, though, after being discouraged by her Topology professor in her pursuit of research opportunities. Instead, she decided to pursue a career in actuarial science, which does not involve the pure mathematics and proofs that she most appreciated in her studies. Sunny remarked that this professor made it seem as though she lacked the ability to involve in research as an undergraduate student and was unhelpful in helping her find a suitable research topic for her directed independent study. Although Sunny had taken for granted a career in academia up until her third year, she considered this particular moment as a tipping point in which she realized she needed to shift her attention away from pursuing graduate-level study in pure mathematics.

It is worthwhile to examine the shift in Sunny's intentions: her initial plan to attend graduate school to pursue research, which morphed into a career path in actuarial science after an undesirable outcome from consulting with her Topology professor. We focused on Sunny's story because, despite her outstanding success in her major, Sunny's experiences revealed potential aspects of women's experiences in the mathematics major that could impact women's decisions not to pursue a career in pure mathematics. Despite earning a degree in pure mathematics, Sunny claimed that she did not feel valued or accepted in her program since she did not feel as a contributor to pure mathematics research. Our research indicates that faculty mentoring impacted women's decisions to pursue careers that are (or are not) in line with their academic background because women in STEM are more prone to social and institutional influences (Xu, 2017).

References

Blackburn, H. (2017). The status of women in STEM in higher education: A review of the literature 2007–2017. *Science and Technology Libraries*, *36*(3), 235–273. https://doi.org/10.1080/0194262X.2017.1371658

Clandinin, D. J., & Rosiek, J. (2007). Mapping a landscape of narrative inquiry: Borderland spaces and tensions. In D. J. Clandinin (Ed.), *Handbook of narrative inquiry: Mapping a methodology* (pp. 35–75). SAGE. https://doi.org/10.4135/9781452226552.n2

Good, C., Rattan, A., & Dweck, C. S. (2012). Why do women opt out? Sense of belonging and women's representation in mathematics. *Journal of Personality and Social Psychology*, *102*(4), 700–717. https://doi.org/10.1037/a0026659

Lahdenperä, J., & Nieminen, J. H. (2020). How does a mathematician fit in? A mixed-methods analysis of university students' sense of belonging in mathematics. *International Journal of Research in Undergraduate Mathematics Education*, *6*, 475–494. https://doi.org/10.1007/s40753-020-00118-5

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press. https://psycnet.apa.org/doi/10.1017/CBO9780511803932

Xu, Y. J. (2017). Attrition of women in STEM: Examining job/major congruence in the career choices of college graduates. *Journal of Career Development*, *44*(1), 3–19. https://doi.org/10.1177/0894845316633787