

Building Metaphors That Describe Mathematics Identity and Experiences among Mathematics GTAs: Locks to Change

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Graduate teaching assistants (GTAs) hold unique positions in higher education as they take on roles of both learner and instructor. Kress (2020) found that GTA identity includes not only their sense as a teacher and student, but also their own relationship with mathematics and how they may - or may not - align with the field. In this poster, we share data from a GTA professional development (PD) activity focused on race. We analyzed work from seven mathematics GTAs who responded reflectively to short biographies of mathematicians of color and to at least one other GTA's writing. Reflections focused on their own racial identities and lived experiences. While this study was not driven by a predetermined research question, the responses from the GTAs on the reflective writing assignment were more complex than expected, which prompted further investigation. In particular, we wondered: *How do biographies of mathematicians of color prompt GTAs to reflect upon their own lived experiences in mathematics?*

Women and students of color are underrepresented in STEM fields (Fry et al., 2021) and thus their mathematics experiences are often viewed through windows of white others, with notably few opportunities for mirrors (Leyva, Quea et al., 2021; Guiterrez, 2018). Motivated by this discrepancy, we leveraged Style's work (1996/1988), which focuses on the concepts of a window and a mirror, where windows allow for one "to see the realities of others" and mirrors provide opportunities for one to "see her/his own reality reflected" (p. 1). Abo-zena et al. (2019) expand on the windows and mirrors metaphor by including doors: a way to foster engagement between diverse individuals and provide opportunities for sharing of ideas and perspectives among those with different backgrounds and lived experiences. Aligning with the house metaphor, we added our own construct, *locks*, to capture statements that highlighted obstacles, challenges, or adversity that the GTAs described.

Our findings show the application of the a priori codes windows, mirrors, doors, and locks. The mirror code occurred in all seven discussion board threads, many of which contain posts by more than one GTA. In relation to the mirror codes, every time a lock code was identified it was linked to a mirror. Five of the six locks occurred where GTAs were looking for a connection to autobiographers through personal challenges. In these cases, they saw the obstacles that they themselves had faced in their mathematics career reflected back by successful mathematicians who looked like them. Often locks were followed up by doors in discussion threads.

Our exploratory study, which emerged from a pedagogical experiment, suggests that GTAs, who are both students and emerging educators, may be positively affected by the reading of biographies of successful mathematicians from underrepresented populations, especially when accompanied by self-reflexive writing. Exploring the reflective practice of this PD may create more inclusive and equitable mathematics classrooms by supporting GTAs in considering personal and systemic experiences of marginalization.

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