

How Cultural and Familial Ideologies Shape MENA Students' Mathematical Identities

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Research in mathematics education has increasingly recognized that learning and identity are intertwined, and what mathematics means to people is socially produced (e.g., Nasir, 2002). These meanings differ across settings and are mediated by race, gender, and culture (Walker, 2012). Students' racialized experiences and sociohistorical contexts shape how they interpret mathematics (Martin, 2000). Yet, little research has examined how students' cultural ideologies, belief systems that help people make sense of the world (Shah, 2017), influence their perceptions of mathematics. This study examines how Middle Eastern/North African (MENA) students, a group largely absent from education research (Modir & Kia-Keating, 2018), negotiate their mathematical identities and perceptions of mathematics with respect to their cultural and familial ideologies. The question guiding this study is: How do MENA students' cultural and familial ideologies shape their mathematical identities and perceptions of mathematics?

This study draws on research on mathematical identity to explore how MENA students' ethnic and cultural backgrounds influence how they view and value mathematics. I define mathematical identity as how students see themselves and are seen by others as math doers, developed through social practice and recognition within communities (Martin, 2000; Cobb et al., 2009; Hall et al., 2025).

Participants were eight undergraduate students who self-identified as MENA and had completed at least Calculus I or equivalent. Semi-structured interviews explored (1) participants' feelings about mathematics, and (2) the influence of cultural and familial ideologies on their mathematics trajectories. Data analysis followed an inductive and iterative coding process informed by thematic analysis (Corbin & Strauss, 2014).

Findings suggest that many participants experienced familial pressures to perform well in mathematics, pursue STEM degrees, or follow similar paths as relatives with mathematics backgrounds. Most expressed that these pressures stemmed from MENA cultural ideologies which conflate mathematics and STEM achievement to success and socioeconomic stability. They felt that because of their culture they "have the potential to be engineers and doctors" and that "the expectation to succeed is linked to mathematics." For many participants, success was often equated with prestigious fields, many of which required mathematics.

Participants' narratives reflected the complex negotiation of self, family, and culture with respect to mathematics identity, revealing how recognition and expectation shaped how they saw themselves in relation to mathematics. Sentiments shifted from obligations tied to family expectations and cultural ideologies, to appreciation when they "found meaning and connections" to their majors or when family members framed it as beautiful. While some family members upheld and enforced cultural ideologies, others encouraged participants to make sense of mathematics in a positive light. This communal support fostered more positive feelings and meaning-making in the mathematics that they encountered. Although most participants described familial pressure as motivating, a few felt that these expectations were limiting. These findings align with Martin's (2000) argument that mathematical identities are shaped by community and broader cultural meaning, underscoring the need to examine how identity development in mathematics is influenced by social and cultural forces that may not be immediately visible.

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