Introduction

- Math anxiety and fixed intelligence mindsets are associated with poor academic performance (Suinn, Taylor, & Edwards, 1988; Ashcraft & Krause, 2007, Yaeger & Dweck, 2012)
- Maladaptive mindsets are especially prevalent among children from socially and economically disadvantaged groups (Claro et al., 2016), perpetuating disparities.
- Understanding the factors that lead children from socially and economically marginalized populations to subscribe to a fixed mindset or experience math anxiety is critical for informing interventions.

Research Goals

- What factors predict fixed mindsets and math anxiety?
- How do children’s identities and perceived stereotypes about the academic abilities of different social groups relate to their academic mindsets and math anxiety?
- Sample economically-disadvantaged children in an urban Indian school, a context with a rich set of social dimensions (i.e., gender, religion, caste, and wealth)
- 80% of children’s families earn less than $5.50/day

Method

Participants

115 7th-graders from a middle school in Gujarat, India (48 girls; 50% Hindu, 43% Muslim, 7% other; 49% self-identified as coming from a relatively poorer family compared to others in the city)

Measures

Two counterbalanced blocks:
- Math Achievement
  - WIAT math (10 mins)
  - Woodcock-Johnson math (10 mins)
  - Arithmetic test (5 mins)

Social Predictors

Survey items assessing, e.g.:
- Stereotype beliefs
  - Some people are better at math because of their [gender/religion/caste/how rich or poor they are].
- Math mindset
  - [My parents think] How good you are at math is fixed and cannot change.

Results

- Confirmed expected negative relation between math anxiety and performance on 2/3 timed achievement measures (WJ: β = -0.034*, Arithmetic: β = -0.091*).

How do students’ beliefs about math ability relate to their math anxiety?

The more fixed students’ own ‘math mindsets’ and their perception of their parents’ math mindsets, the greater their anxiety.
- Child math mindset (β = 0.102*)
- Perceived parental mindset (β = 0.146**)

The more students endorsed stereotypes relating social dimensions and math ability, the greater their anxiety.
- Gender stereotype (β = 0.144***)
- Caste stereotype (β = 0.235***)
- Religion stereotype (β = 0.185***)
- Wealth stereotype (β = 0.072)

Students with more fixed mindsets were more likely to endorse math stereotypes generally (β = 0.213*).

How do students’ own social identities relate to their math anxiety?

Levels of math anxiety did not differ significantly by gender or religion, but did by self-assessed relative wealth or security: students who saw themselves as wealthier were less math anxious (β = -0.142*).

Conclusions & Future Directions

- While gender has been the primary social dimension related to math anxiety in the U.S., religion and wealth seem to be particularly salient dimensions for students at this school.
- Endorsement of ambiguously-phrased stereotypes relating math to gender, religion, wealth, and caste were highly intercorrelated, and predictive of math anxiety.
- Among socially and economically marginalized groups, subscription to stereotypes about academic ability may go hand in hand with differences in mindset and math anxiety.
- Ongoing work explores students’ explanations for stereotypes.
- Interventions on anxiety and mindset might target students’ stereotypes about academic ability.

References


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