



Mindsets and Beliefs of Incoming College Freshmen on Math

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Abstract

This study examined the causes and reasons behind students' fixed and growth mindsets, specifically in math. The University of New Haven incoming freshmen class (Class of 2023) participated in an online survey that focused on personal and school demographics, current beliefs about math, and their mindset profiles before starting school. Ten students from the Class of 2023 were chosen to participate in an interview which focused on their personal experiences in math classes.

The goal of the study was to pinpoint the main reasons why students have particular beliefs and mindsets about math. Some of the reasons identified were teacher quality, help with math at home, and general comprehension of the subject.

Background

Dr. Cooper and Professor Rivers have been conducting their own research with their own students for the past several years, where they provide them with their mindset profiles. The goal with my study was to get a look into students mindsets and beliefs before they even step into one their classrooms.

Carol Dweck, a professor of psychology at Stanford University, created the concept of growth and fixed mindsets. Dweck conducted a study with a group of 10-year olds and discovered that those with a growth mindset "understood that their abilities could be developed," (Dweck, 2014).

Someone with a growth mindset understands that intelligence is flexible and can improve over time (Degol, 2017). On the other hand, Dweck noticed that those with a fixed mindset "run from difficulty," (Dweck, 2014). Those with a fixed mindset learn to have the highest level of intelligence and see success in their victories rather than in their improvement (Degol, 2017).

Research Questions

1. What are students' mindsets and beliefs about math before they step into college level courses?
 - How do students feel in a math course?
 - What do students believe about math?
 - What are their mindset profiles, i.e. growth, fixed, and to what extent?
2. How have past math experiences shaped the mindsets and beliefs of students?

Methodology

Methods

- Distributed a survey to the Class of 2023 (n = 241) during SOAR by handing out bookmarks with the survey link.
- Conducted 5 to 10-minute interviews (n=10).
- Gave incentives to 4 people per SOAR event and to all 10 interview participants. All incentive winners received a \$25 Amazon e-gift card.

Measures

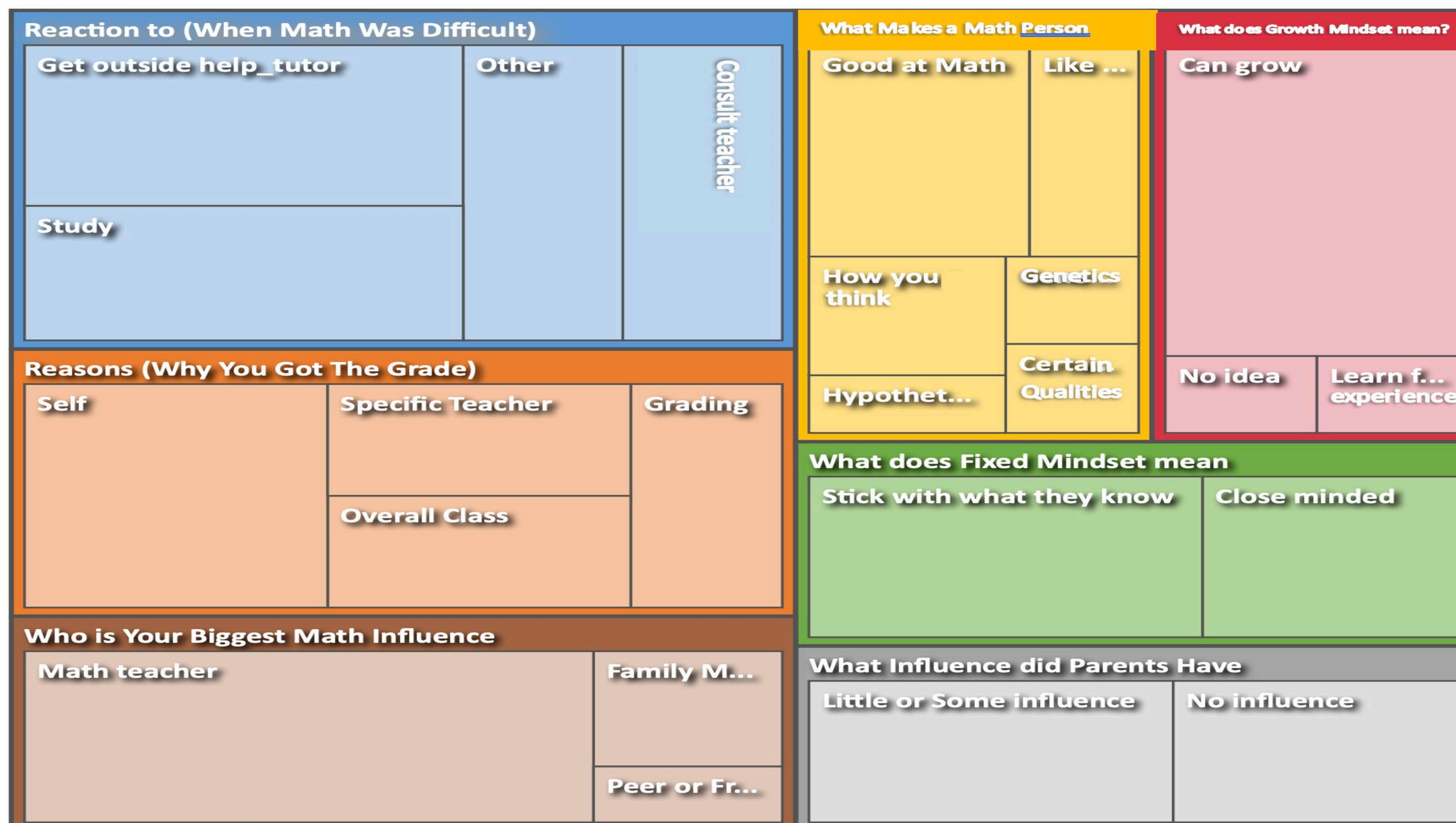
Measures

- Mindset profile
 - Adapted from Mindset Works, Inc
- Attitudes Toward Mathematics Inventory
 - Adapted from ATMI (Martha Tapia 1996)

Survey Findings

- 91.3% said their last math course was senior year.
 - Most students took Algebra & Geometry
 - Most recent math class was pre – calculus.
- 80% said they received mostly A's & B's in high school.
- 75% said they were far/somewhat above average students
- Over 50% strongly agreed/agreed with statements that positively reflected on their general math experience.
- Based on students general and personal beliefs about math
 - 70.4% said that math is a very worthwhile and necessary subject
 - 69% said that math teaches them how to think logically
 - 65.7% said that math is one of the most important subjects for people to study.

Hierarchy Chart of Themes



Interview Findings

- How well did you do in your last math course?*
- No one said they did badly. Everyone either said they excelled or did pretty well.
 - Most responded with their grade.
- What were some of the reasons you got the grade you did?*
- Most said themselves, they were always good at math, they studied, did homework, paid attention, asked questions
 - Many also responded with their teacher being the reason, they were good teachers who helped them in the class.
- Who is/was your biggest math influence?*
- Most said their math teacher. Quite a few were even able to mention them by name.
- Most have never heard of a growth mindset, but have heard of a fixed mindset

References

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Special Thanks

SURF, CSELO, Class of 2023, and to my mentors Dr. Danielle Cooper and Professor Yevgeniya Rivers.