Masha Apostolidu
MSc Psychology
25th June 2025

Maths Resilience in Further Education: The Role of Self-Efficacy and Teacher Perceptions

Quantifying the impact of teachers and individual factors on FE students' maths anxiety and self-efficacy

"Stopping Myself from Improving"

Annalise's Story

"Stopping myself from improving"

"Maths and I had always had a little bit of a rocky relationship. Even from primary school, the constant fear of failing in class scared me, because I felt there was the expectation to understand everything and not ask for help. Therefore, in some ways, I could say that it created a stigma around how I looked at maths.

It was in year 10 that I realised once more that I couldn't seem to understand what others in my class managed to do right away. This resulted in me giving up straight away if I couldn't answer something, and so I didn't have any drive to continue.

Now at my work place I don't put myself forward for promotions as it will require for me to use maths and the fear is still holding me behind."

Annalise, 19

Annalise is not alone…

Why this project?

This project was a year-long Research Project in MSc Psychology

Impacted by:

Personal experience as a Mathematics Teacher in the Further Education (12+ years in FE)

Low maths skills, fear and avoidance of maths in adult FE learners

Looking for the narratives behind negative responses to maths learning in 18+ learners

National Numeracy facts

Skills for Life 2011; PIAAC 2014; National Numeracy YouGov Survey 2014

National Numeracy facts

1 in 4 adults in the UK believe school maths did not prepare them well for maths in everyday life.

National Numeracy facts

Among those aged 24+ numeracy skills decline with age

But too few people take steps to improve their numeracy.

Why do we have problems with maths?

- **Positive Attitude and Achievement:** Research shows when students have a positive mindset and confidence in completing math tasks, they tend to perform better.
- **Negative attitudes** towards maths linked to to disengagement, increased anxiety, and a reluctance to try to improve skills
- Attitudes towards mathematics are influenced by multiple factors, among them: teachers, family, peers, value of maths and maths anxiety
- To date there has been very limited research into psychological factors affecting attitudes in maths in 18+ learners in Further Education, UK

What do we mean by “attitudes to maths”?

- Lack of theoretical construct and framework for maths attitudes (Wen&Dube, 2022)
- Tripartite model of attitudes:
  - cognitive components (value, gender role beliefs, self-efficacy, self-concept)
  - affective components (enjoyment, anxiety)
  - behavioural components (time on task)
- Maths self-efficacy and maths anxiety as strong predictors of performance (Zakariya et al., 2019)

What contributes to maths attitudes?

Predict attitudes

- **Maths anxiety**

One person's panic, helplessness, paralysis, and mental disorganization when they are facing a mathematical problem". (Tobias, 1981))

- **Maths self-efficacy**

Person's belief in their ability to complete a mathematical task (Hackett & Betz, 1989)

Impact self-efficacy and anxiety

- Teachers in the past
- Current teachers
- Value of maths
- Maths self-concept
- Maths mindset
- Self-regulation
- Past experience

The current study

Relationship between perceptions of past and present teacher characteristics and how those predict mathematical self-efficacy and anxiety, in combination with individual characteristics through a quantitative hierarchical regression analysis.

Mathematical self-concept, Self-regulation, Motivation, Growth Mindset and Utility of maths

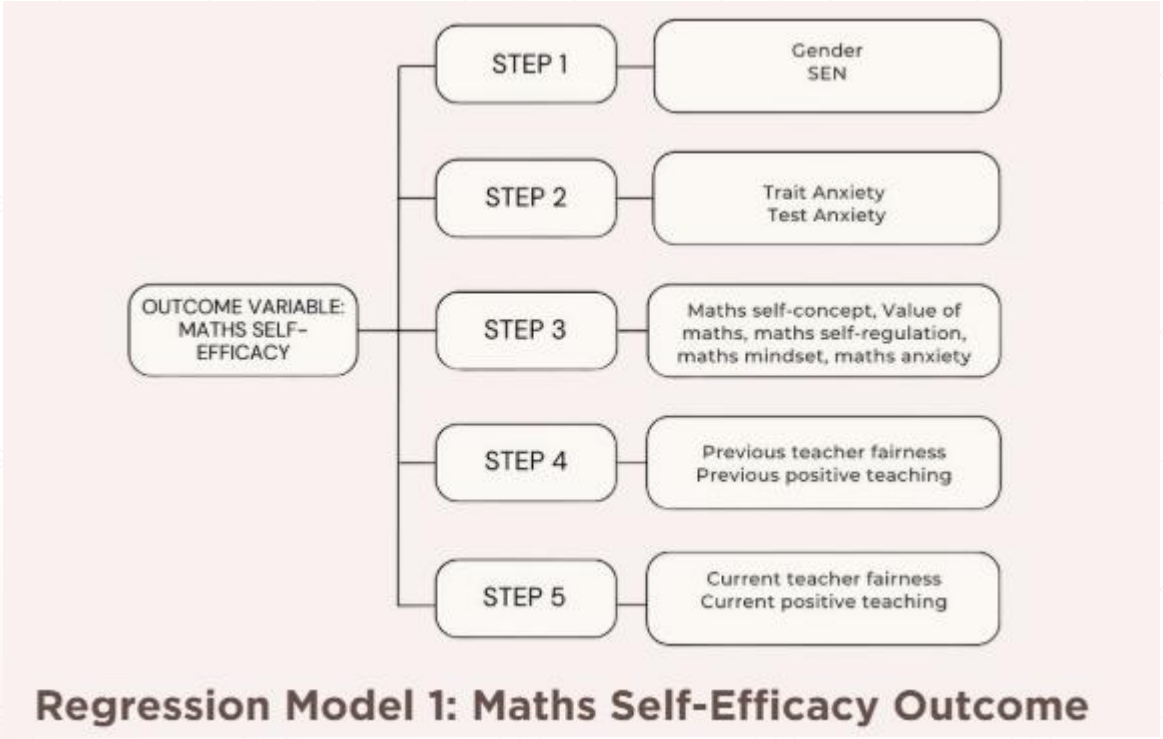
Maths Anxiety

Maths Self-Efficacy

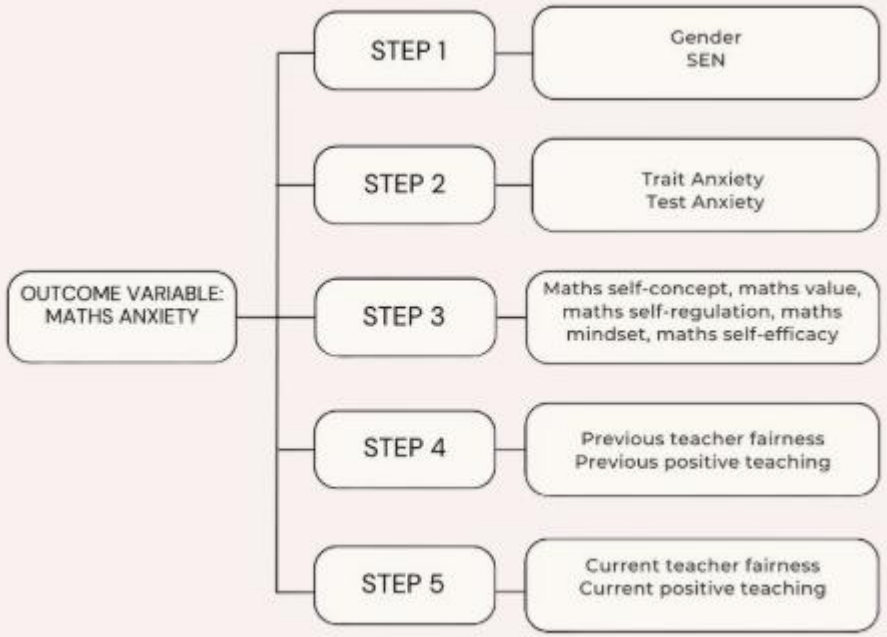
Also considering the following data:

- age, gender, most recent maths qualification and special learning needs
- test and trait anxiety

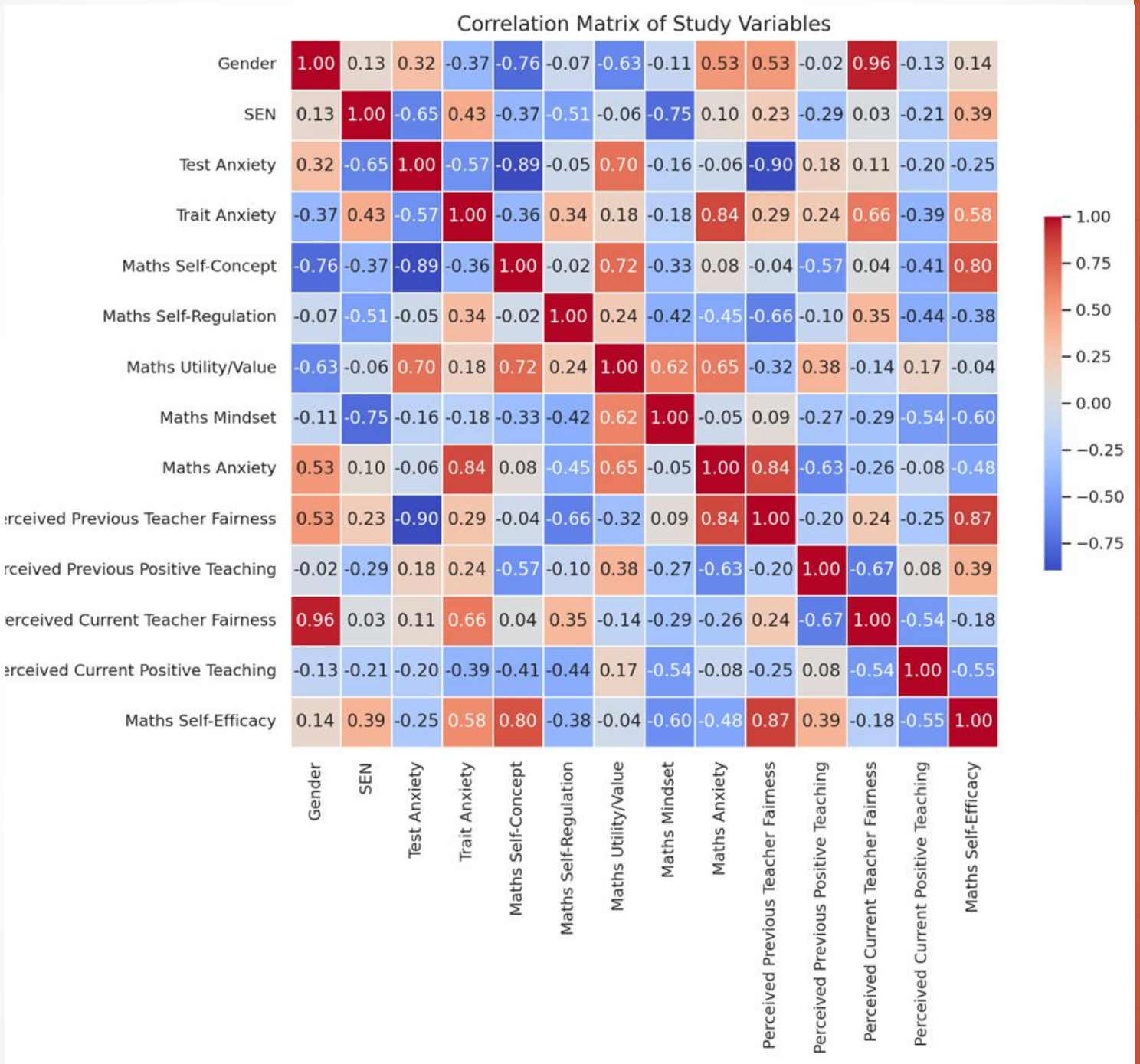
Analysis



Regression Model 1: Maths Self-Efficacy Outcome



Regression Model 2: Maths Anxiety Outcome



Analysis

Correllations Matrix

The current study

- Diverse sample of students (18-69 years) who had not achieved a Level 2 maths qualification (N=152) from across England, recruited via FE colleges and social media. Self-report questionnaire.
- Two hierarchical regression models tested psychological and teacher-related predictors of maths self-efficacy and maths anxiety.

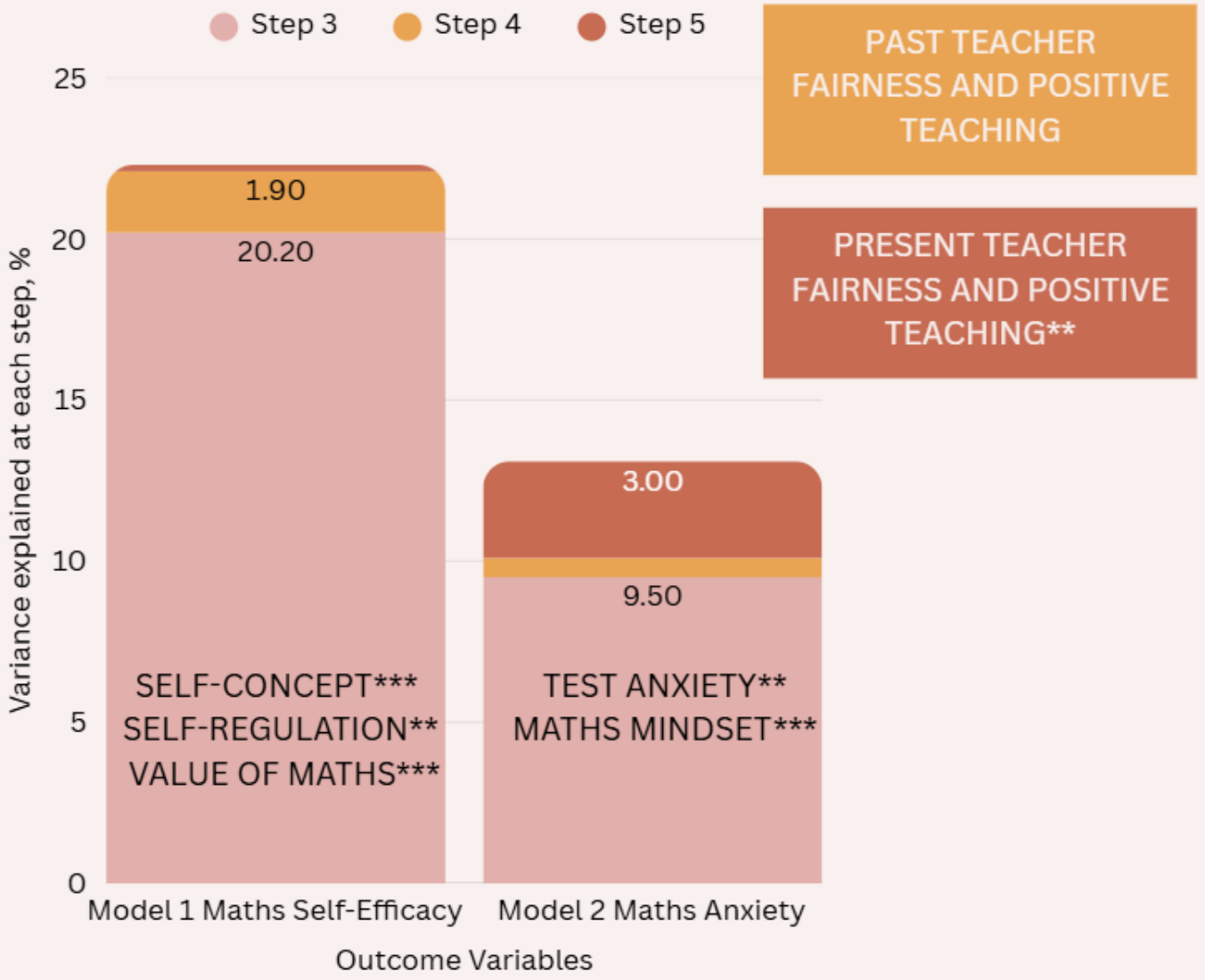
The current study – research questions

To assess the relationship between a range of maths self-beliefs, maths anxiety, and perceptions of past and present maths teachers.

To assess whether perceptions of previous maths teachers will predict maths anxiety and maths self-efficacy.

To assess whether perceptions of current maths teachers will predict maths anxiety and maths self-efficacy.

To assess whether maths self-beliefs and attitudes will predict maths anxiety and maths self-efficacy.



Key findings
% Variance explained at Steps 3 - 5

**** p < .001; ** p < .01;*

Key findings

Maths self-concept, self-regulation, and value of maths were consistent predictors of maths self-efficacy.

Test anxiety significantly predicted maths anxiety at multiple stages.

Growth mindset predicted lower maths anxiety, independent of perceptions of teachers.

Present teacher fairness significantly predicted lower maths anxiety.

Conclusion

- Perceptions of current teacher fairness and maths mindset are key predictors of maths anxiety, highlighting the importance of emotional and relational factors in FE students' experiences.
- Maths self-efficacy is shaped more by internal beliefs than teacher perceptions, pointing to the need for support that builds personal growth and confidence.

Next steps

Continue with data collection to analyse a larger data set

Exploring opportunities of a longitudinal study of past vs present teacher effect on maths attitudes in low achieving maths students transitioning from upper secondary to further education in England

Project early-stage publication in Association of Colleges

https://d4hfzltwt4wv7.cloudfront.net/uploads/files/How-maths-self-beliefs-affect-maths-performance-Quantifying-the-impact-of-teachers-and-individual-factors-on-FE-students%E2%80%99-maths-anxiety-a.pdf

References and abstract