Mathematics Anxiety

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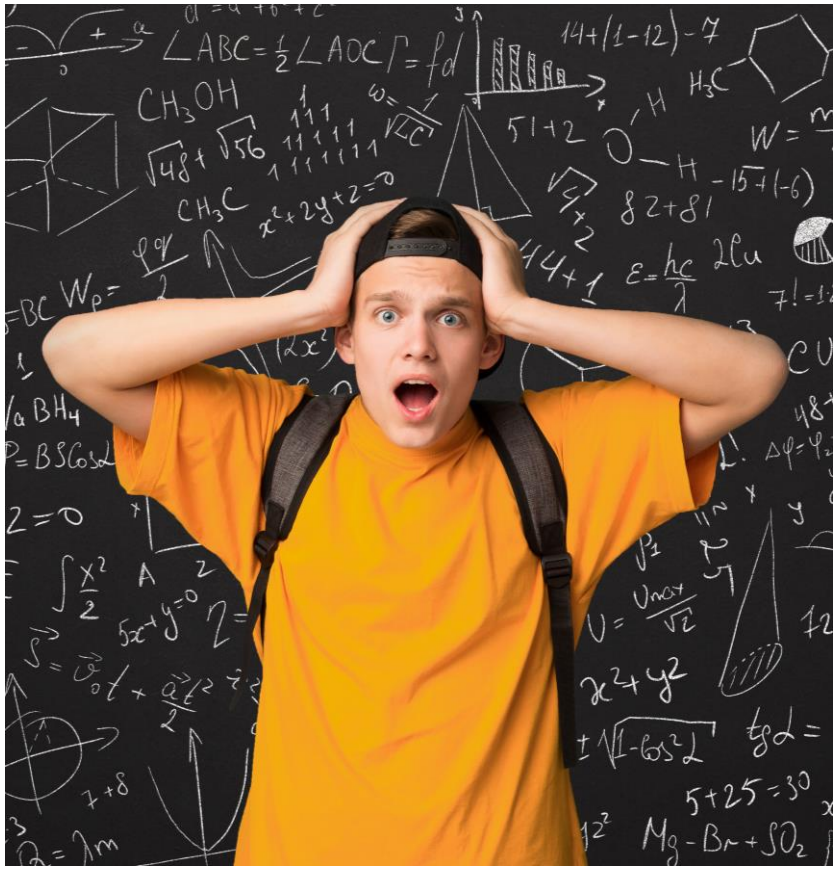
Defining maths anxiety

- “The panic, helplessness, paralysis, and mental disorganization that arises among some people when they are required to solve a mathematical problem” (Tobias and Weissbrod, 1980)

- “Feelings of tension, apprehension, or even dread that interferes with the ordinary manipulation of number and the solving of mathematical problems” (Ashcraft & Faust, 1994)

- “A negative response to a person’s previous, current, or anticipated experience of maths. This might include learning, evaluative, and applied contexts and typically comprises emotional, cognitive, and behavioural components” (Kirkland & Hunt, 2025)



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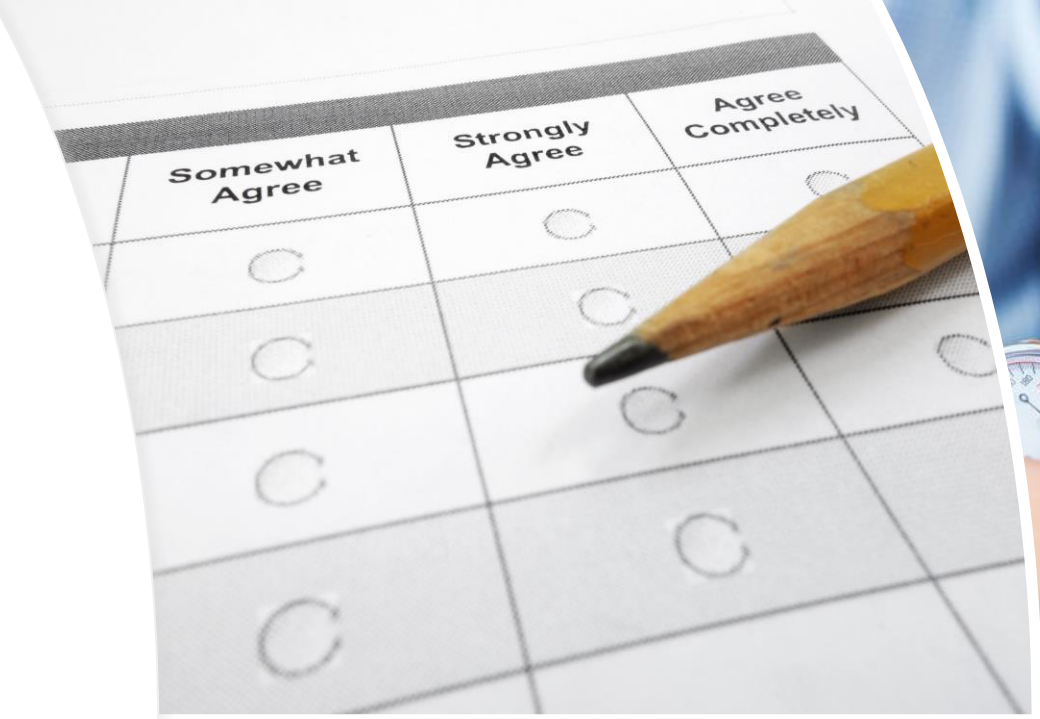
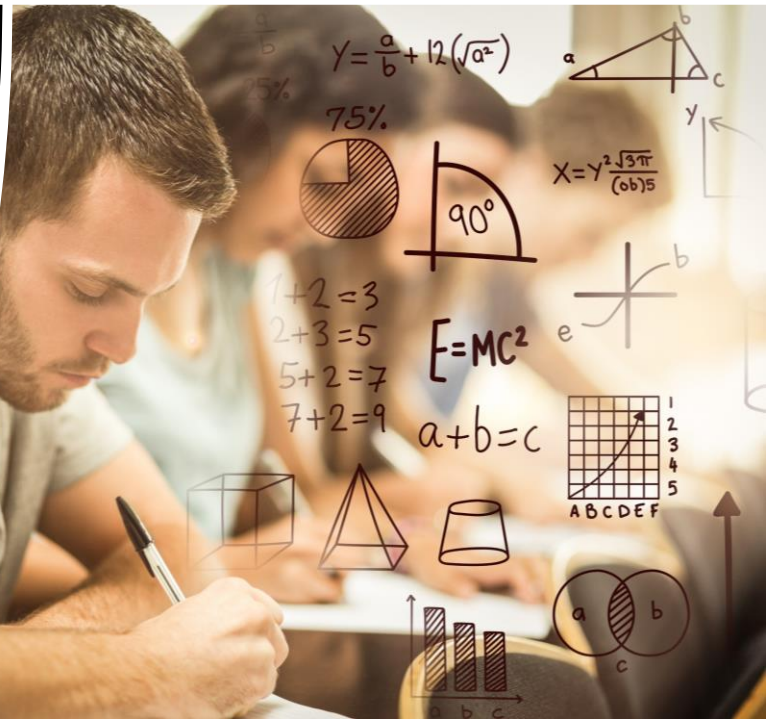
Empirical observations





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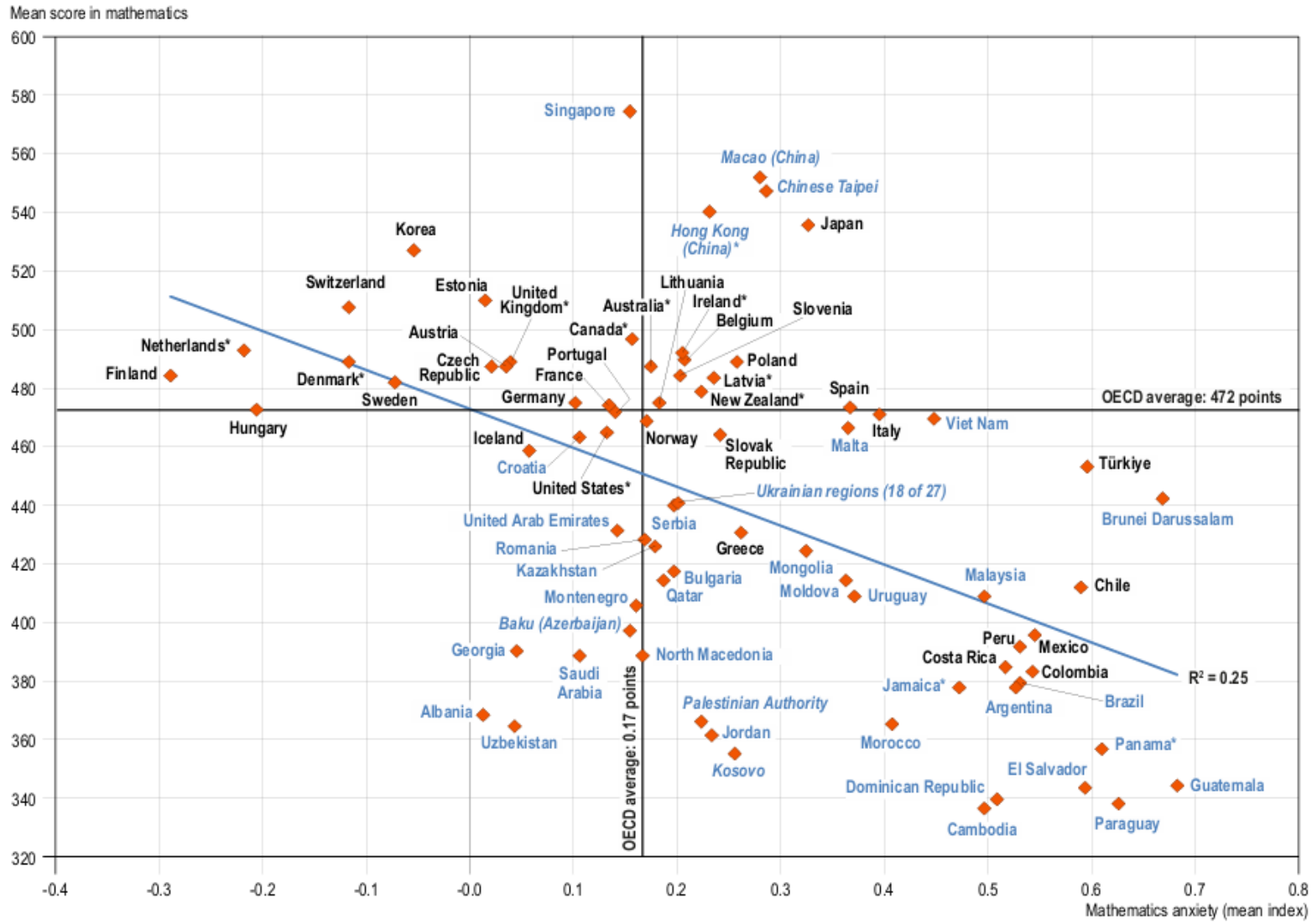
Micro & macro behaviours

- Engagement
- Attention
- Task performance
- Test performance
- Overall attainment
- Study/career decisions

Maths anxiety and performance: PISA 2022



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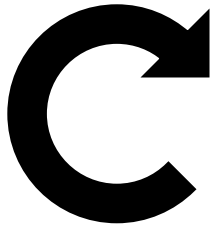
Some psychological correlations (antecedents?)

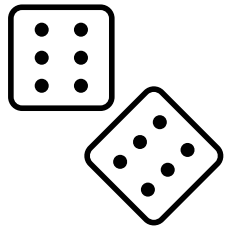
- Shame
- Self-beliefs (mindset, self-concept, self-efficacy)
- Value / motivation
- Enjoyment
- Other anxiety
- Appraisal of previous experiences

Alternative pedagogy

Co-operative learning



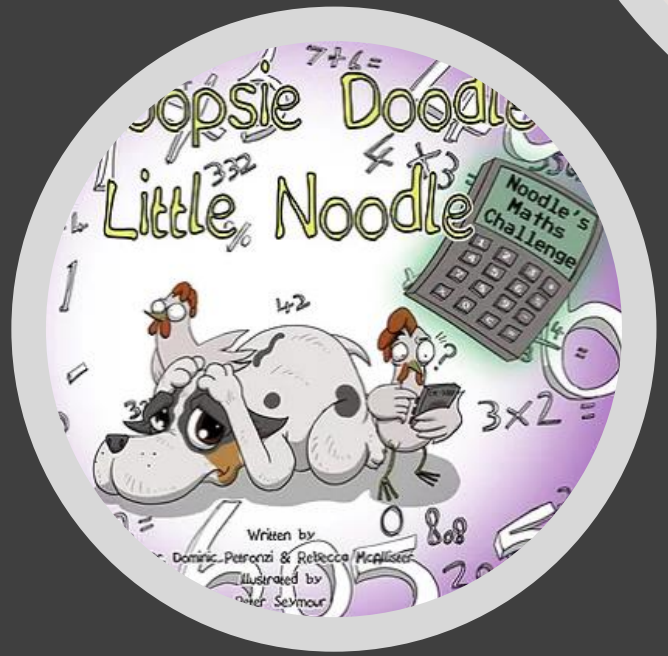
Flipped classroom

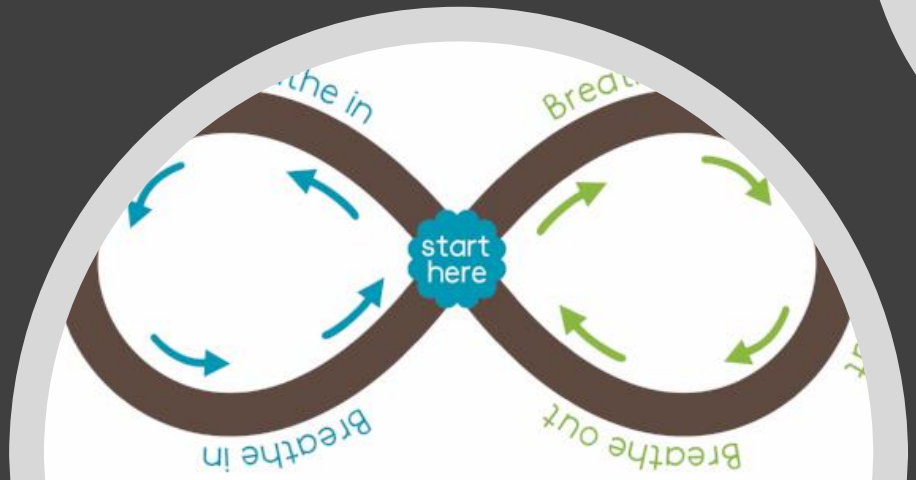


Gamification of calculation problems

Emotion regulation

- Expressive writing (mixed results)
- Psychodrama therapy (limited testing)
- Relaxed breathing (consistent results)
- Bibliotherapy (promising results)
- Dog therapy (some paws for thought)





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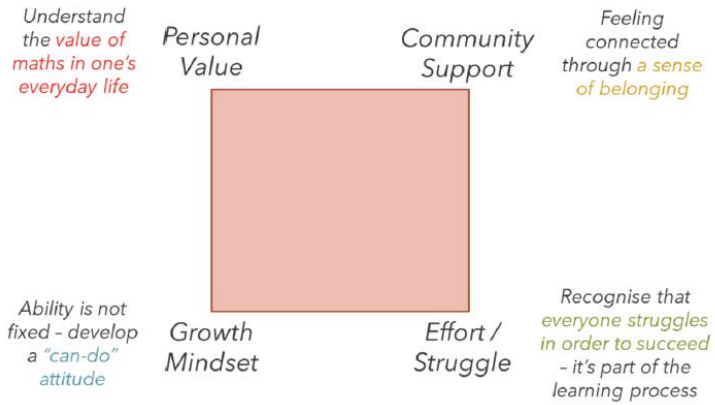
Appraisal

- Turning a threat into a challenge (Jamieson et al., 2016)
- Reappraising previous experiences of maths? (Hunt & Maloney, 2022)
- Deconstruct feelings of shame? (Hunt et al., in prep.)

Toolkit approaches



RESEARCH IN POST-COMPULSORY EDUCATION
https://doi.org/10.1080/13596748.2023.2206704

Routledge
Taylor & Francis Group

Check for updates

Breaking through the fear: exploring the mathematical resilience toolkit with anxious FE students

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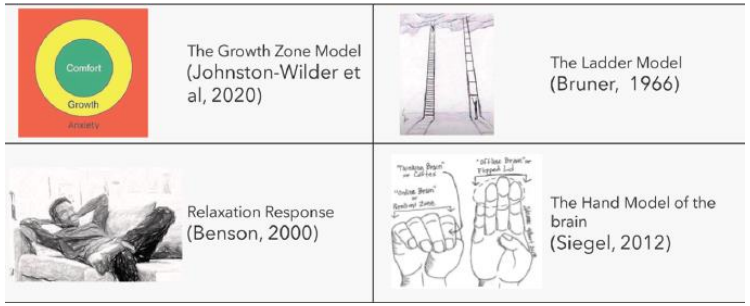

The Growth Zone Model (Johnston-Wilder et al, 2020)

The Ladder Model (Bruner, 1966)

Relaxation Response (Benson, 2000)

The Hand Model of the brain (Siegel, 2012)

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PAPER

Developmental Science WILEY

Math anxiety and math achievement: The effects of emotional and math strategy training

Maria Chiara Passolunghi | Chiara De Vita | Sandra Pellizzoni

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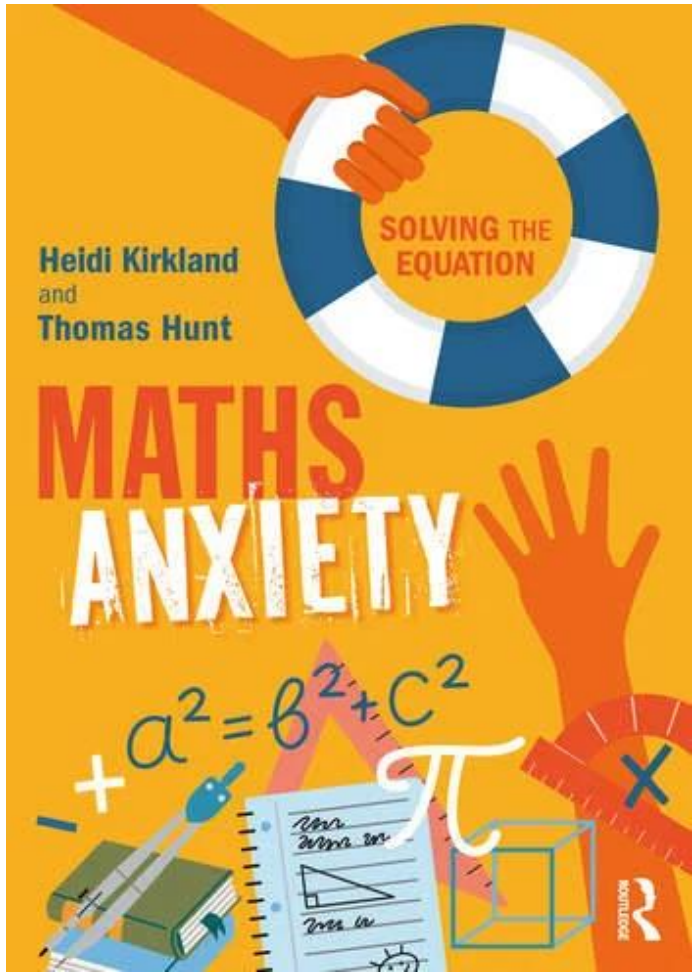

- What is Maths Anxiety?
- Who experiences it?
- Can I measure it?
- What is involved in Maths Anxiety?
- Who and what can influence it?
- What can we do to provide support?
- Can teachers experience Maths Anxiety too?

Summary

- Maths anxiety is multidimensional
- Individual differences and external factors need to be considered
- A multi-pronged approach to addressing maths anxiety is best
- Need to target thought processes, behaviour, and emotion regulation