

Mathematics and Examination

Anxiety in Adult Learners:

findings of surveys of GCSE Maths students in a
UK Further Education college

By

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Introduction

- Action research study to support my reflective practice
- Pilot for a larger project?
- Further Education (FE) college in the Midlands of the UK
- Learners: Adults, from 16 to 60+ years; approx. 75% in their 20s and 30s looking for a career change via Access courses or university
- Delivery: One 3 hour session once a week, for 30 weeks
- Resources: VLE, eLLP, links to phone apps, online videos, recommendations on workbooks and revision guides, libraries, computers
- GCSE Exams: Two tiers, Foundation and Higher; two papers, one with calculator, one without, May and June, up to 2 hours in length

Literature Review: Causes and Effects

- Causes:

Timed testing (Tobias, 1993; Ashcraft, 2002; Boaler, 2009 & 2016)

Early streaming (Boaler, 2009)

'Quiet' classrooms (Tobias, 1993; Sfard, 2008; Boaler, 2016)

Unrealistic or irrelevant problems (Boaler, 2009; Dalby, 2012)

Lack of time (Swain, Newmarch & Gormley, 2007; Boaler 2009)

Lack of trust (Warner Weil, 1989; Tobias, 1993; Dalby, 2012)

Parental and teacher attitudes (Tobias, 1993; Macrae, in Coben, 2003; Barton & Stone and Woolley in Griffiths & Stone, 2013; Beilock & Willingham, 2014)

- Psychological and neurological effects:

A 'disability' -, career choices, employment, professional success (Young, Wu & Menon, 2012); Self efficacy and esteem (Boylen & Povey in Black, Mendick & Soloman, 2009; Dalby, 2012; Lewis, 2013)

Literature Review: Interventions

All Maths, Teacher Training and CPD materials

Delivery content: (Coben & Black, 1994; Swain, Newmarch & Gormley, 2007; Boaler, 2009 & 2016)

Delivery methods: (Tobias, 1993; Sfard, 2008; Dalby, 2012; Kinead, 2015) including failure as necessary for growth (Beilock & Willingham, 2014; Boaler, 2016)

Learner surveys: TIMSS (Trends in International Mathematics and Science Studies) (Lewis, 2013); Fennema-Sherman (Tobias, 1993); Peskoff & Khasanov, 2015

Ethics & Methods

- Sampling: non-random. Anyone who was present on the survey days
- 2016/17 is a longitudinal study, same cohort across 4 classes
- Ethics:

Written approval obtained from Principal (guarantee of student anonymity highlighted).

Consent form for learners (14 day cooling off).

- Two questionnaires:

Five point Likert scale

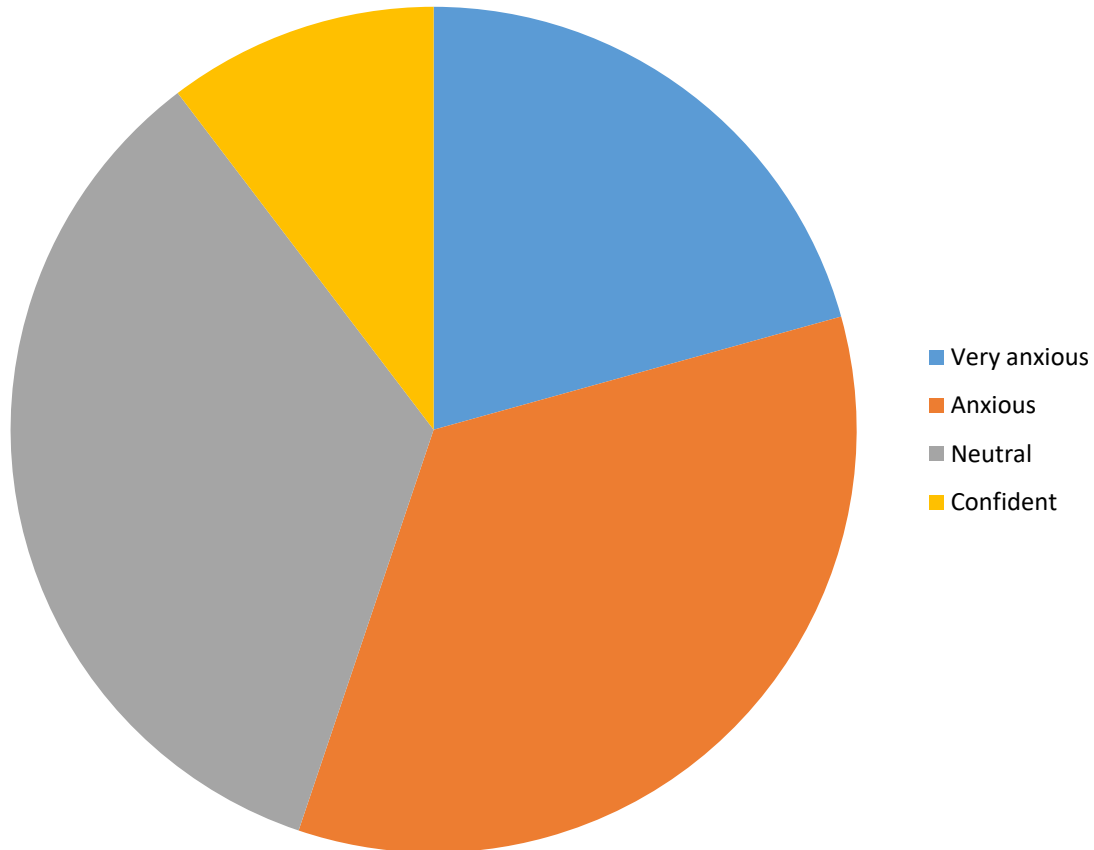
Can they identify any general or specific events that led to lack of confidence in maths or exams?

If their views have changed, how do they feel now?

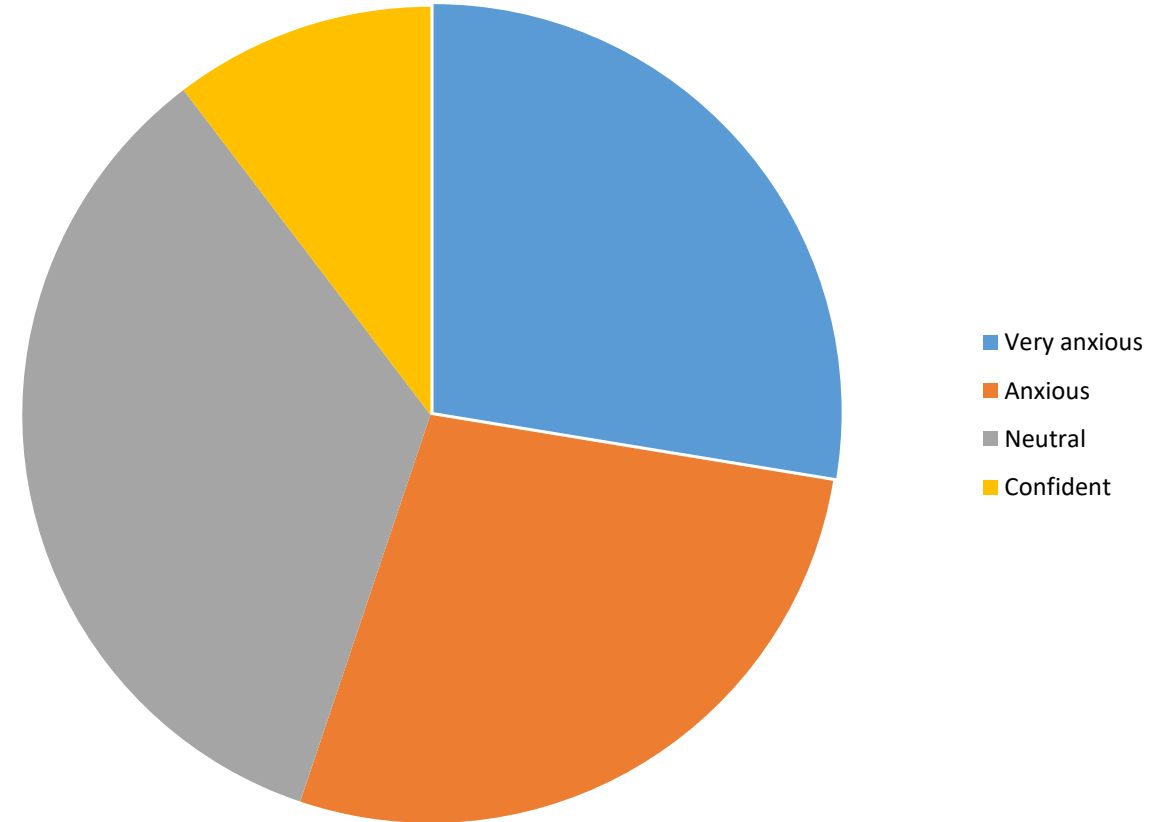
Survey results from September 2014

29 learners

Maths anxiety



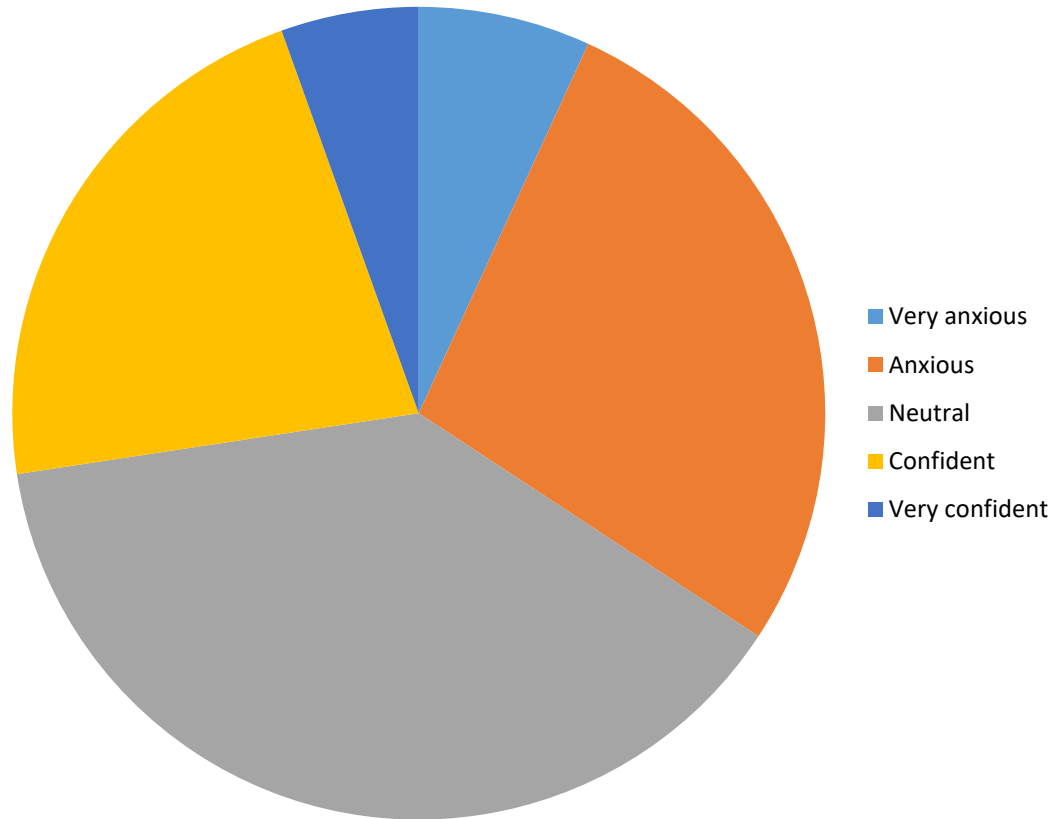
Exam Anxiety



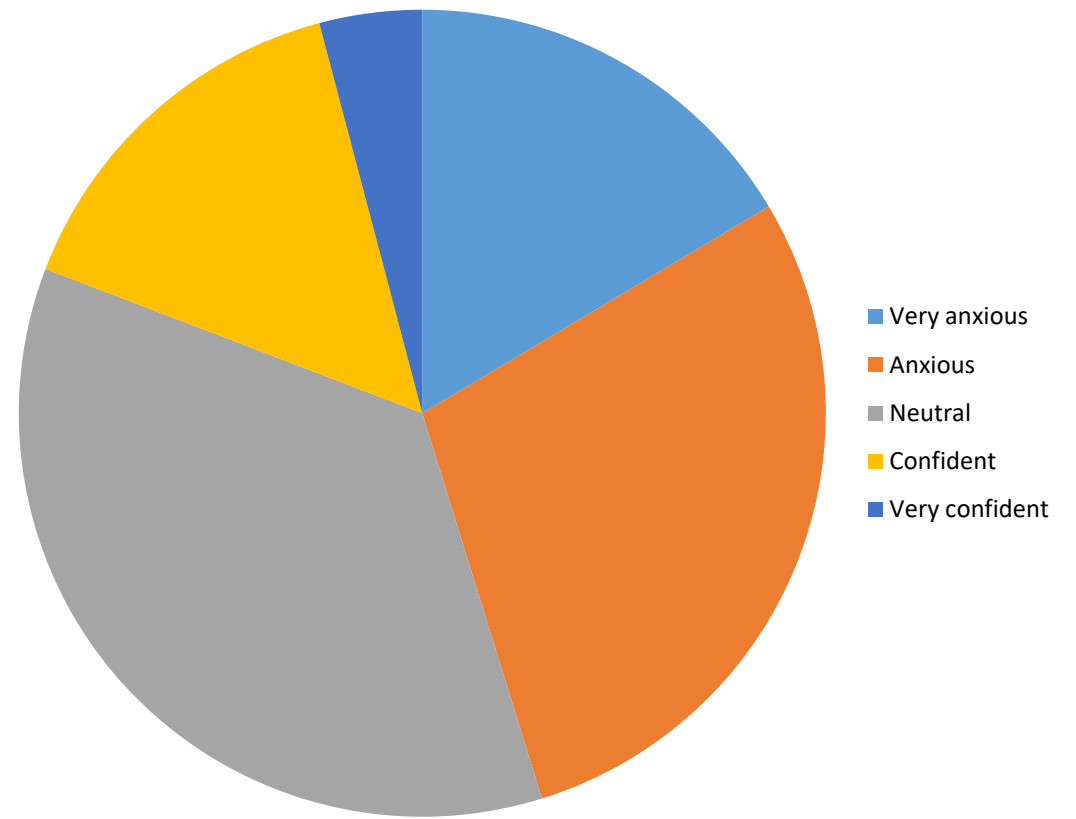
Survey results from September 2015

73 learners

Maths Confidence



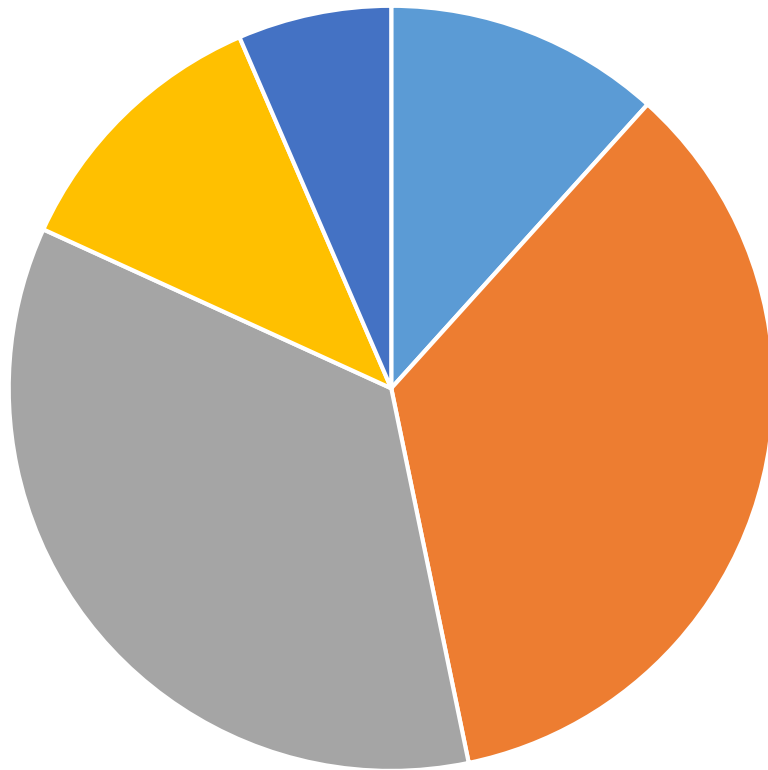
Exam Confidence



Survey results from September 2016

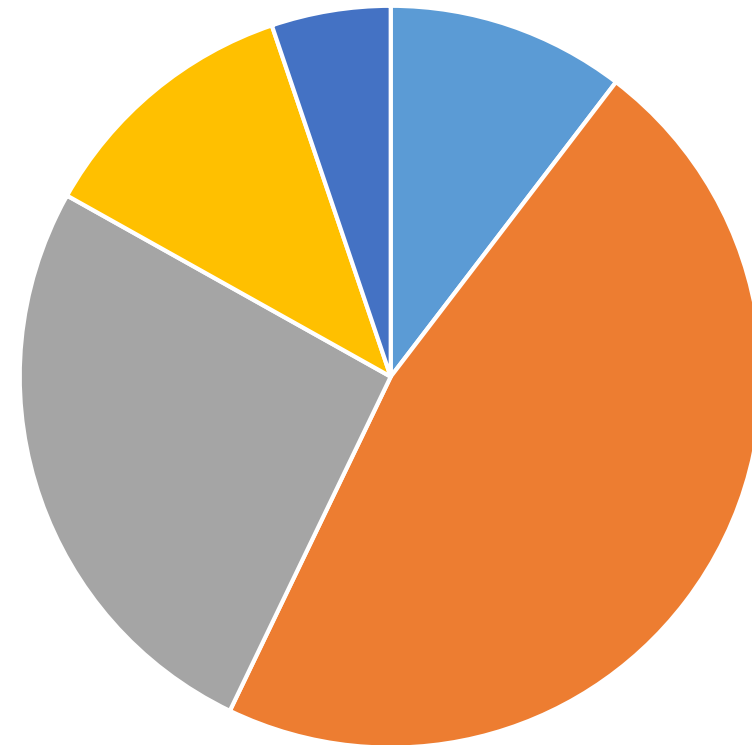
77 learners

Maths confidence



■ Very anxious ■ Anxious ■ Neutral ■ Confident ■ Very confident

Exam confidence



■ Very anxious ■ Anxious ■ Neutral ■ Confident ■ Very confident

Survey April 2017

Distribution of maths and exam anxiety

Maths(M) and exam(E) anxiety	Number	Percentage
Neither	12	26
Both MA and EA	20	44
MA only	8	17
EA only	6	13
Total respondents	46	100

Survey April 2017 by gender and nationality

Group of 46 respondents	Percentage of group	Percentage anxious or very anxious: Maths	Percentage anxious or very anxious: Exams
Whole group	100	59	57
Male	20	10	10
Female	80	90	90
GB	90	96	96
Non-GB	10	>4%	>4%

Survey April 2017

Learners by age

Age bands in years in September 2016	Number of learners out of 46	Percentage anxious or very anxious: Maths	Percentage anxious or very anxious: Exams
Up to 21	5	60	60
21 to 30	14	50	57
31 to 40	20	65	50
41 to 50	7	57	71

Patterns in comments: Maths anxiety

- Felt stupid or humiliated in class, by teachers or other pupils: 13 comments
- Issues around asking questions, needing more explanation or more time: 11 comments
- Poor performance/loss of confidence: 7 comments
- Clashed with staff: 6 comments
- Disengaged from school/maths classes/coursework/maths exams: 6 comments
- Streaming: disruptive lower classes (3), or too low a level (2): 5 comments
- Other: unenthusiastic teaching (2), over faced (2), time gap since school (2), language (non-GB 2)

Patterns in comments: Exam anxiety

Group 1 MA with EA (20); Group 2 EA only (6)

- Group 1: 22 comments; exam pressure (6), only/more anxious in maths exams (3), fear of failure (3), lack of experience (3), tension and fear (3), intimidated by others working away (2), too many people in the exam room (1), gap since last exam (1)
- Group 2: 13 comments; exam pressure (7); tension and fear (3), fear of failure (1), too many people in the exam room (1), lack of confidence in answers (1)

Conclusions 1

- GB educated females have a proportionally higher rate of anxiety about maths and exams than their non-GB educated or male peers
- Age does not seem to be a significant factor for anxiety levels
- Although 44% of respondents have maths and exam anxiety, they are linked for only 3 out of the 20 learners, so timed testing is an issue, but rarely only a maths issue
- There is little difference between the comments on exam anxiety in the maths anxious and non maths anxious groups

Conclusions 2

- There is some agreement between the literature and the learners on factors that have caused their maths anxiety, namely lack of time, lack of trust (between teachers and pupils), and perceived teacher attitudes. From the learners' points of view, (with the benefit of hindsight), the relationship between staff and students seems to have been a critical factor
- For these mostly 19+ adult learners the need for relevant and realistic problems seems to have receded (possibly due to more life experiences, or problem solving has been accepted as a pertinent vehicle for testing)
- Early streaming was identified by only two learners

Comments on FE classes: changing views

- “Functional skills prior to GCSE really helped”: 96% of those respondents who have gone from FS to GCSE agree
- Several learners have been identified with specific learning challenges, such as dyslexia, and many have colour preferences for background or text
- “I am no longer afraid of Maths, I rather enjoy it now” “relaxed and comfortable environment” “motivated fellow learners” “I’m a lot more positive about maths now” “It has helped a lot at work” “The teacher is understanding” “There is no pressure” “Willing to push myself” “I know it needs time” “I look forward to Maths” “Good when it clicks” “I know I need to work at it”
- My favourite: “I love maths” 😊

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