Research Article

Maths Fear Reasons and Steps to Reduce

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This article highlights the methods that have been shown to help students, parents, and educators deal with mathematics anxiety. Mathematics has played and continues to play an important part in the educational experience of students at all levels, from the distant past to the current day. People are frequently confronted with mathematical problems in their everyday lives and are required to apply a wide range of skills, including estimation, data analysis, numerical processing, and logical reasoning, when making decisions. In addition to helping students become better mathematicians, it also helps students gain a broader perspective on the world, spark creative problem-solving, and develop novel approaches to old issues. In order for students to realize their full academic potential, educators and researchers must address the widespread problem of mathematics fear. We study that there is a relation between math anxiety and math performance and the factors that contribute to math anxiety. We also build a novel Interpretation Account of math anxiety and use it to make the case that it is critical to investigate evaluation processes to effectively cure math anxiety. Finally, research gaps are discussed, along with recommendations for future studies that can fill those gaps and advance our understanding of this crucial topic.

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Introduction

Anxiety about Maths is the uncomfortable feelings that prevent you from working through Mathematical challenges. The effects of anxiety, and of arithmetic anxiety, can linger throughout a child's development and education, and even into adulthood. Because of mathematics central role in our daily lives, it is incumbent upon us as educators and parents to assist young learners in overcoming their apprehension of the subject.

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Math anxiety is not some general idea; analysis, numerical processing, and logical reasoning, when making decisions. Even though its education is continually emphasized, many students regard mathematics as difficult to understand and learn. Mathematics is abstract for children from a young age; with dread of the unknown, the child is terrified of mathematics, and this anxiety persists until adulthood. Many students regard mathematics poorly because they perceive it to be an increasingly tiresome, dull, and frightening subject. As a result, mathematical achievement is low, many students' and teachers' time is wasted, and the necessary manpower cannot be attained Aarnos et al [1]. The mathematics course is one of the most important courses for students at all levels, and its failure is regarded as a major issue by students, parents, instructors, and administrators. One of the most significant barriers to learning is failure to succeed.

According to [2], the fundamental problem that must be resolved in mathematics education is the inability to achieve coupled with the misconception that mathematics is difficult. Because of this necessity, a significant number of pupils will find mathematics to be one of the most challenging and uninteresting topics. The worry that students have towards their performance in mathematics is one of the most significant issues that can be found in this field. As a result, research on math anxiety has seen widespread application in the quest to improve students' performance in mathematics. It was observed that there was a negative and moderate link between mathematics achievement and anxiety in a meta-analysis that was carried out by Ahmed et al [3].

The examination of the relationship between mathematics achievement and mathematics anxiety revealed that there was a negative and moderate relationship between the two factors. It is clear that not all pre-school and elementary school kids had the same reaction to their first encounters with mathematics. The primary reason why the student is anxious about mathematics and dislikes the lesson is because she/he believes she/he cannot succeed in mathematics. Students that struggle with maths anxiety are well-documented to perform poorly in the subject. Remember that if precautions aren't done, the problem will only get worse and worse until it's unavoidable [4][5][6].

Many studies have found that students who have high levels of math anxiety do not report experiencing similar levels of worry for any other courses Ambady, N et al [7][8]. Maths is notoriously challenging compared to other subjects, yet students' performance often suffers because of underlying worry. Based on the severity, duration, and significance of the external danger, the normal or pathological nature of anxiety depends not on the origin of the emotion but on these factors, as stated by Ashcraft, M. H et al [9] in his discussion of learning approach theories regarding anxiety. In addition, it can be a mood that

encourages creative and productive action in everyday life, or it can be a sensation that impedes action and frequently leads to dissatisfaction.

Math anxiety, according to Wilson, T. D et al [10], is "an alarming phenomenon that leads to a loss of confidence due to an inability to perceive the content of mathematics." Woike, B et al [11] noted that people have a natural aversion to the thought of having to deal with mathematics, and that this fear extends to the possibility that they do not even wish to deal with mathematics. Wu, S. S et al [12][13] conducted research to identify the reasons of Math anxiety among aspiring teachers. They claim that the roots of arithmetic anxiety can be traced back to primary schools and that classroom teachers are typically the ones who first plant the seed for it. Math anxiety has been blamed on a number of factors, including a too-rigid classroom atmosphere, teachers' ineffective approaches, not enough time for demonstrations, and overly difficult and unrealistic problem-solving assignments.

What Exactly Is Math Anxiety?

Many people suffer anxiety, stress, and worry when attempting mathematical tasks Young, C. B et al [14] and state anxiety Mandal, A.K et al [15] math anxiety is regarded to be a fundamentally different kind of worry. Math anxiety affects a student's heart rate, neural activation, and cortisol levels, as well as their feelings about math [16].

Higher-math-anxious students, for example, have elevated heart rates Mohamed, S. H et al [17] and, when reminded of an upcoming math task, exhibit neural activations similar to those observed in people experiencing physical pain. It affects individuals of all ages, from young children to senior adults, and is globally associated with lower math achievement and a negative mindset toward math. We wanted to present a comprehensive overview of the research, drawing on discoveries from education, psychology, and neuroscience to emphasize the causes, consequences, and prospective therapies of arithmetic anxiety.

Along with reviewing the existing frameworks for explaining the origins of arithmetic anxiety and its relationship to bad performance, we suggest a new interpretation, account framework that indicates how evaluation can greatly impact anxiety and performance. With regards to math anxiety, we present a new conceptual framework, and in doing so, we outline a number of important problems that remain unanswered. Scientific evidence on mathematics anxiety: causes, indicators, symptoms, diagnosis, and treatment are insufficient, inconsistent, and necessitates additional research. The application of new

approaches will enable, for example, the detection of genes involved in the development of mathematical difficulties.

To help each child reach his or her full mathematical potential, it is important to understand the factors that influence mathematical development. This brief overview sought to demonstrate that this is a potential topic that requires further study at multiple levels, such as studies to elucidate causes and mechanisms, studies to validate diagnostic tools, and studies to support treatments and intervention.

Math Anxiety Diagnosis

In order to research and alleviate math anxiety, reliable diagnostic tools are required. Two types of tests are being used in the current times, these are cognitive and physiological.

Cognitive Measures: Questionnaires and Scales

Most questionnaires and rating scales used to gauge math phobia are directed towards adults and older teens. Known scales include the Mathematical Anxiety Research Scale or MARS, the Fennema-Sherman Mathematics Attitude Scale, the Mathematics Attitude and Anxiety Questionnaire, and the Infant Mathematics Attitude Scale. However, there are possible issues with questionnaire measurements, such as the validity of the answers and the respondents' ability to self-criticize Richardson, F.C et al [18] have sought to deal with this issue by utilizing anxiety-related physiological indicators. Some studies have found that arithmetic anxiety can begin as early as age six, so Dr. Buckley warns that it's important to address the issue with children as young as that. By the time students are in high school and tackling more complex topics like algebra, their maths anxiety is in full bloom.

Sarah Buckley says that myths around maths — such as the idea that it's something you can do or not — can fuel anxiety. (Supplied)

There are also a lot of myths floating around about maths and what it means to be good at it. A big one is that you are either a "maths person" or you aren't, and that you can't improve your skills with effort, Dr Buckley said. "That's a fixed mindset when it comes to how you feel about maths."

Gender stereotypes are also a major source of negative beliefs about maths in girls, who tend to experience maths anxiety more often than boys, even though they perform just as well in the subject, she added. "If a student identifies as a female and believes that 'girls are not good at maths', then that may

lead them to think that they do not have control of their ability to learn in maths, as it is determined by their gender." It also doesn't help that the way maths is taught in many schools is the stuff of nightmares.

Many of the mathematics teaching methods that have been used for decades — such as sitting timed maths tests — are also a recipe for anxiety, The pressure to memorise and recall numerical facts at lightning speed is something Ms Tregoning remembers well from her days at school. While she wanted to take the time to understand how things worked, such as why a formula was written a certain way or applied to one problem instead of another, her class was more interested in getting the right answer — fast.

"It was rules without reason," she said.

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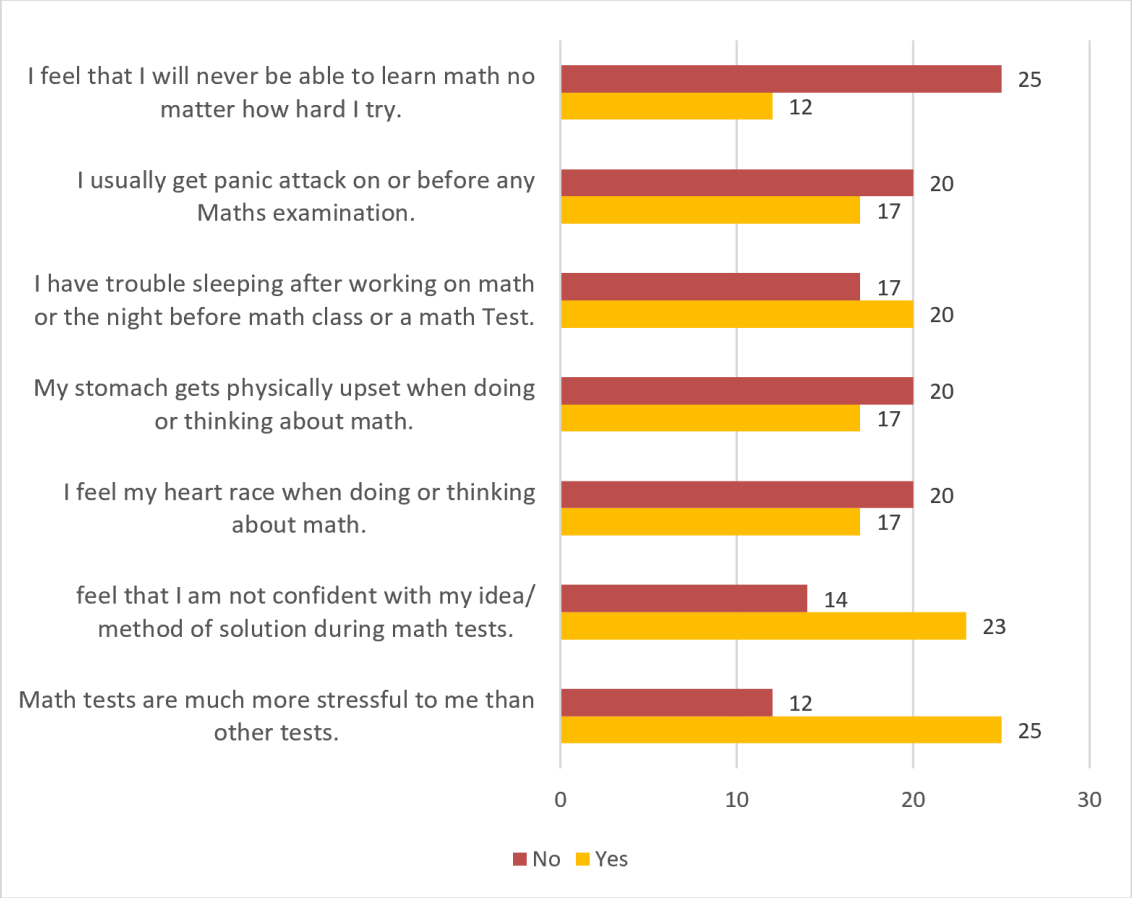
Questions	Response (Yes)	Response (No)
Math tests are much more stressful to me than other tests.	25	12
feel that I am not confident with my idea/ method of solution during math tests.	23	14
I feel my heart race when doing or thinking about math.	17	20
My stomach gets physically upset when doing or thinking about math.	17	20
I have trouble sleeping after working on math or the night before math class or a math Test.	20	17
I usually get panic attack on or before any Maths examination.	17	20
I feel that I will never be able to learn math no matter how hard I try.	12	25
I feel that others have a more "mathematical" or "logical" mind than I do.	17	20
I rely on other people to help me with day-to-day math situations.	11	26
I find myself worrying about other people's math abilities and comparing them to my own.	16	21
I feel that although I am quite talented at some things, none of them help me with math.	17	20
I feel like I have never really understood math and I am faking my way through it.	14	23

Table 1. Sample table



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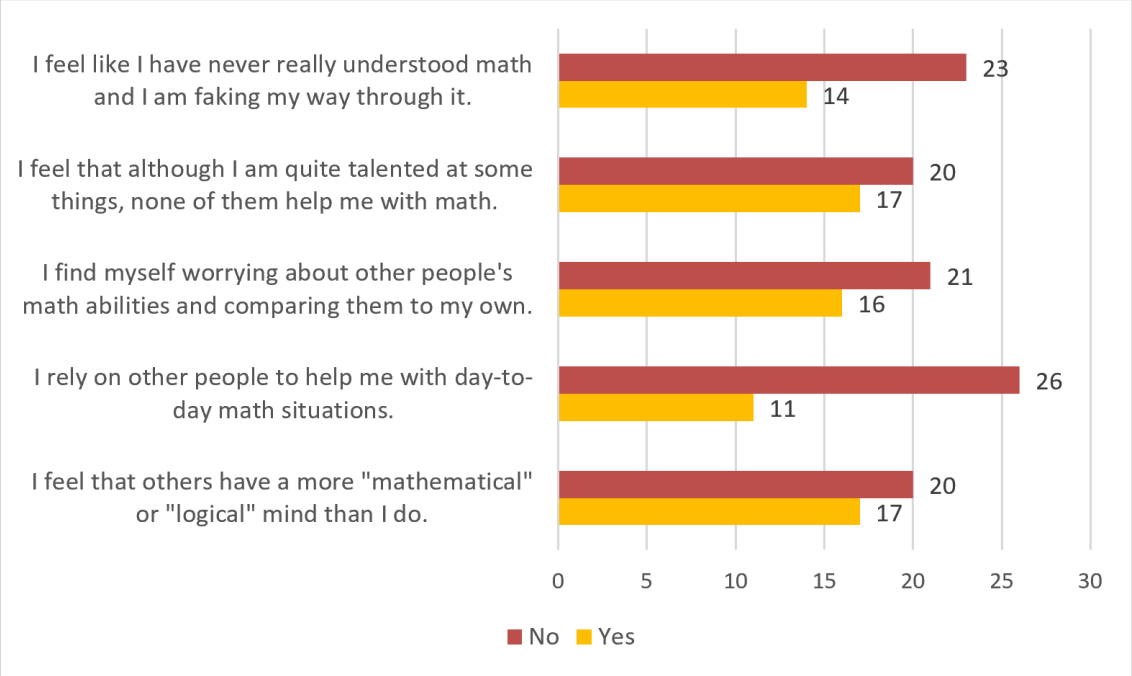

Chart 2. Sample table

Math Anxiety: Possible Cure Options

There is a lack of agreed-upon criteria for diagnosing and treating math anxiety, let alone preventing it. Early treatments for kids who struggle with arithmetic can probably stop a vicious cycle where math problems lead to anxiety, which leads to further math problems. One tactic is for parents and educators to model enthusiasm for the subject. The media may also do more to highlight mathematics' value and appeal.

The first step in conquering your arithmetic fears is reevaluating your confidence in your mathematical prowess. Dr. Buckley said that comparing one's mathematical views to one's opinions about other areas was one method to identify harmful assumptions. For instance, your reaction to making a mistake while playing a sport might be to simply pick the ball up and try again without any dramas. Another way to get more comfortable with maths is finding it in the things you love. The beauty of mathematics lies in the fact that it underlies every domain of thought imaginable. For instance, many of the cornerstones of music, such timing and rhythm, have their origins in mathematics.

While maths anxiety still sneaks up on her from time to time, she believes her experiences have helped her become a better maths educator.

"It's important that kids have efficient access to number facts, but how they acquire those number facts is just as important," she said.

"Having gone through mathematics and not understanding it, you almost have this real desperation to ensure that the kids and teachers you work with understand."

Strategies For Students to Reduce Math Anxiety

Following are the several strategies suggested by different experts and researchers which students can use to overcome their math anxiety.

1. Practice makes a man perfect. In order to overcome math anxiety, students should practice math every day
2. Math should be learnt with good study techniques
3. The past success of students should be focused
4. Students should never shy away from asking help
5. Students can learn math with their own learning style
6. Students should not merely depend on memory
7. Students should make good use of relaxation techniques.

Eliminating Worry Is Not sufficient

Concerns about math performance alone may not be enough to warrant an intervention. Though it's true that anxiety and negative thinking can get in the way of your math performance, doing away with them alone won't guarantee you'll excel. It's possible you'll also need to correct an inaccurate mental picture of numbers, particularly fractions. Remedial education may be required.

Take Your Time

The most accurate students put in the greatest time to their work. However, negative performance feedback may continue to reinforce your unfavorable self-perceptions about arithmetic ability if you adopt a strategy to get through the content as quickly as possible in order to lessen your discomfort in the near term. Even if math is hard for you, take the time you need to get the right answers.

Use Your Anxiety For Focus

To a certain extent, anxiety can be beneficial. Higher levels of physiological anxiety were linked to greater math performance in our study. The presence of sweaty palms and a increased heart rate does not always portend failure or confusion, but rather increased attention and focus. Remember that feeling anxious is normal at times.

Conclusion

Math anxiety is a complex phenomenon with many unfavourable outcomes. It has a global influence, affecting people of all ages and being linked to lower math achievement and more pessimistic views of the subject. Our goal in this study was to give a comprehensive overview of the literature on math anxiety, focusing on the factors that contribute to the problem, its repercussions, and the most promising treatments currently available. We review the various frameworks that try to account for math anxiety and its association with bad performance and offer a new one, the Interpretation Account Framework, which shows how appraisal can significantly affect both. By putting forth this fresh perspective on math phobia and addressing some key open questions we can help solve the problem.

Statements and Declarations

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Authorship

All authors reviewed the results and approved the final version of the manuscript.

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Conflicts of Interest

The authors declare that they have no conflicts of interest to report regarding the present study.

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