
On mathematics anxiety

The jury is in – maths anxiety is a problem, and it seems to be worse for girls.

Mathematics anxiety seems so prevalent that it's begging for its own DSM-5 entry. I spoke to [YouTube superstar Eddie Woo](#) a while back, who gave the discussion the nuance it rarely gets. The Centre for Independent Studies has issued [a report](#), which gives some clarity about what mathematics anxiety is and isn't. It gives some answers about its prevalence and the potential consequences, but not so much on what to do about it.

The report was written by the legendary David Geary, who argues that there are two types of knowledge acquisition, biologically primary and biologically secondary. Primary knowledge requires no direct teaching, like basic means-end problem solving or the acquisition of oral language. Babies acquire more words than would even be possible with direct teaching in the first few years of life. On the other hand, they don't spontaneously pick up solving equations. The kind of learning that happens in schools is unnatural and formal education is a recent invention in the evolutionary scheme of things.

Geary also knows a lot about how we learn mathematics. His analysis paper does a great job of summarising the issues, and the prognosis is not great. The good news is that this is a learned or conditioned fear. It's a response to a situation, and in that sense similar to examination anxiety, which so far also doesn't have its own DSM-5 classification. It's not particularly domain specific. It can be treated like any other anxiety response. Exposure therapy through teacher-led tutoring can work. Just as with other inquiry or student-led methods, a lack of structure and guidance can actually exacerbate student anxiety. However, it's concerning that many families would be unable to afford intensive therapy for their child, not to mention the shortage of teachers and therapists available to do this work.

What's more concerning than the coverage to date is that girls appear to be more prone than boys, even when controlling for overall test anxiety and anxiety traits. Generally, early struggle in mathematics leads to anxiety, but high performing girls experience anxiety in a similar way to those who genuinely struggle. The resulting performance avoidance cycles can eventually impact achievement. Possibly as a result of anxiety, girls express lower utility beliefs about the subject of mathematics, and this may go some way to explain why fewer girls pursue STEM careers.

There seems to be little consensus on how to practically treat mathematics anxiety. I can say for certain that schools are too stretched to provide the kind of CBT and exposure therapy recommended. Adults – including teachers and parents – are sometimes known to express their own anxieties about mathematics. I've done this in front of my own children, who thankfully ignore me most of the time. I recently completed an online introduction to statistics and felt a wild panic come up every time I became cognitively overloaded. Perhaps automaticity of basic maths fact recall is key. But, like reading, if it is not embedded from a young age, it may be very difficult to steer students away from a lifetime of avoidance and fear.



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This article originally appeared on the author's blog, [On Education](#).

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