

## Maths fear 'activates brain pain'

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Fear of maths can activate regions of the brain linked with the experience of physical pain, a US study has found.

The higher a person's anxiety of a maths task, the more it increases activity in regions of their brain associated with visceral threat detection, and often the experience of pain itself, according to researchers Ian Lyons and Sian Beilock, from the University of Chicago, in the journal Plos One.

The authors say that previous research has shown that other forms of psychological stress, such as social rejection or a traumatic break-up, can also elicit feelings of physical pain.

However, they say their study examines the pain response associated with anticipating an anxiety-provoking event, rather than the pain associated with a stressful event itself.

The authors say their results indicate the mathematics (math) task itself is not painful but merely the thought of it is highly unpleasant to certain people.

"Math can be difficult, and for those with high levels of mathematics-anxiety (HMAs), math is associated with tension, apprehension and fear," the authors said in their paper titled, When Math Hurts.

"Interestingly, this relation was not seen during math performance, suggesting that it is not that math itself hurts, rather, the anticipation of math is painful. Our data suggest that pain network activation underlies the intuition that simply anticipating a dreaded event can feel painful.

"These results may also provide a potential neural mechanism to explain why (people with) HMAs tend to avoid math and math-related situations, which in turn can bias (those with) high levels of mathematics-anxiety away from taking math classes or even entire math-related career paths."

"We provide the first neural evidence indicating the nature of the subjective experience of math-anxiety."

The researchers used 14 people with HMAs and 14 who had low levels of maths anxiety. The subjects were then asked to complete word tasks and maths tasks.

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