

# The myth of the ‘growth mindset’

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The concept of growth mindset has become hugely popular in recent years, but does it have a foundation in research?

My son is five years old, and a few weeks ago he finished his first year of school (which for some reason is called ‘reception year’ rather than ‘year one’). In the last week or so of term, he was given his first ever piece of official homework. It was to make a poster demonstrating the importance of something called a ‘growth mindset’.

Mindsets are an idea in educational psychology that have become fashionable in the past decade or so, mainly through the work of Professor Carol Dweck, a Stanford researcher. People with ‘fixed’ mindsets, according to the theory, believe that abilities are fixed: if they aren’t good at, say, maths, they think “guess I’m just not good at maths”, and give up.

People with ‘growth’ mindsets, on the other hand, think “I need to practise more at maths if I’m going to get good at it”. The really interesting claim, though, is that through the use of relatively minor interventions – things like praising a child for “working hard”, rather than for “being clever” – you can instil a growth mindset. And that doing so dramatically improves children’s outcomes at school and beyond.

I should, here, [declare a conflict of interest](#), which is that [I wrote a piece in 2017](#) that was sceptical of growth mindset, questioning whether the statistics behind it stand up. So I have publicly nailed my colours to the mast on this topic, and the laws of [motivated scepticism](#) dictate that I will therefore tend to find problems with the research. So, bear that in mind as you read on.

Growth mindset has become something of a phenomenon. When I wrote my piece in 2017, I reported that hundreds of British schools were using mindset interventions in class; things like the poster my son made. [CBeebies helpfully informs you](#) how to instil a growth mindset in your preschooler. The University of Portsmouth’s ‘[Changing Mindsets](#)’ programme has been going since 2012 and has worked with thousands of pupils in years five and six across Britain. The *Guardian* [this year called it](#) “arguably the most popular psychological theory in education”.

It’s also hugely popular outside education: [Google](#), [NASA](#), [the British government](#) and [Bill Gates](#) have all recommended it. *New York Magazine*, back in 2007, [did a whole big feature](#) about how you should never praise your kids for being clever, because if you did they’d turn out to be feckless weaklings who give up at the first hurdle (I paraphrase).

But despite all this excitement, when other scientists tried to find what the original researchers found, they often struggled. Tim Bates of Edinburgh University was the first researcher I became aware of who was explicitly trying to replicate it. His three studies of [624 children](#) aged between 10 and 12 found no effect: children’s IQ did not improve, nor did their educational attainment, or their ability to get over setbacks.

One large, preregistered study by David Yeager, a long-time collaborator



of Dweck's, looking at 12,000 ninth-graders (14- to 15-year-olds) in the US, has apparently found a link. It's not published yet, and the [preprint](#) has – unusually – been taken down for revisions, but it's still available [here \(PDF download link\)](#). It found apparently real, but tiny, impacts: if I'm reading it right, the 'effect sizes' – the statistical measure of the impact – were all below 0.15. Effect sizes of less than 0.2, [by convention](#), are not large enough to be considered 'small'. According to the paper: "On a 4-point grade metric ('A' = 4.0, 'B' = 3.0, etc.), the average treatment effect was 0.03 grade points."

(For comparison, I worked out an effect size in one of the studies in Dweck's original 1998 paper, and found it was 1.6! That is *huge*.)

[Another pair of meta-analyses](#) found that the correlation between growth mindset and academic achievement, on a scale where 0 is 'totally random, no link' and 1 is 'perfect 100% correlation', was 0.1, although it was a bit higher (0.19 and 0.15) for children and adolescents.

They also found that smaller studies – but not larger ones – were more likely to find results that were more positive than average, which is what you'd expect if many of the more negative results were quietly being hidden in desk drawers, a problem called 'publication bias'.

More amazingly, the meta-analysis found that mindset interventions only correlated significantly with academic achievement when ["the manipulation check failed"](#) – that is, the students' mindset had not in fact changed. If your growth mindset intervention actually invokes a growth mindset, then it won't help! That suggests that the data is,

according to a psychologist friend, "very noisy and messy".

And, last month, the Portsmouth 'Changing Mindsets' programme [finally reported](#), having undergone an independent assessment by the Education Endowment Fund, which was supporting it with a £300,000 grant. It found: nothing.

That's not quite how they write it up. They say that pupils "who received the growth mindset workshops made an average of two additional months' progress in English and maths", but that "the findings were not statistically significant" – i.e., there's a strong possibility that they are pure fluke. When they gave teachers the growth mindset training, children actually did *worse*, by about the equivalent of two months' progress – but again, non-significant, so very likely pure chance.

The effect sizes range from -0.11 to +0.18, hovering around the zero mark – so even if it turns out that they are real, they're small. But under the [usual conventions](#) of scientific publishing, these are null results.

For what it's worth, my bet is that there is some small but non-zero effect of mindset interventions on learning, although I would not be at all surprised to learn that it's entirely ineffective. But assuming it's real, this tiny effect does not come for free.

The Portsmouth programme's workshops cost about £400 per pupil per year, apparently. The average spend per English primary school pupil in 2017/18 was £4,700; for secondary school, £6,200. So we're talking about spending 7% of the total money per pupil on mindset interventions. Other interventions, such as that studied in

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the Yeager paper, were cheaper. But the effects are so small that we need to think very carefully about whether they're cost-effective.

There's folk wisdom here that we can all agree on and in fact is kind of obvious: if you believe that you can't improve on your abilities, you won't work to improve them. But we all know that practice makes you better at things. Still, most of us also think that practice only gets you so far. While we can all learn to play the violin, only some of us can play at Carnegie Hall. Most of us are both growth and fixed mindsets, in the end.

Anyway, we quietly ignored our son's "homework". The poster was forgotten. Hopefully his mindset will survive.

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*Tom Chivers is a science writer. His first book, The AI Does Not Hate You is out now. This article first appeared on UnHerd, and is reproduced with kind permission. Visit [www.unherd.com](http://www.unherd.com) for more.*