

'I'm Not A Math Person' No Longer A Valid Excuse

By Kelly Dickerson

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[Reported by Jerry Becker, jbecker@SIU.EDU]

Contrary to popular opinion, a natural ability in math will only get you so far in studies of the subject.

Research published in Child Development found that hard work and good study habits were the most important factor in improving math ability over time.

But bad attitudes about math are holding us back.

Most of us would never think that "I'm bad at reading," is a good excuse to stop taking English classes, so why is it ok, even normal, to say "I'm bad at math"?

A survey in 2010 conducted by Change the Equation found that three out of 10 Americans said they consider themselves bad at math. Over half of the 18 to 34-year-old bracket find themselves regularly saying they can't do math. Almost one-third of Americans reported they would rather clean a bathroom than solve a math problem. [<http://changetheequation.org/press/new-survey-americans-say-%E2%80%9Cwe%E2%80%99re-not-good-math%E2%80%9D>]

And this math anxiety is a real problem: A study published in PLoS One in 2012 found that anticipation of doing math can actually affect the same regions of the brain that pain does. Essentially, math is painful.

[<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0048076>]

Our attitude about math matters more than we think

Generally, people believe their learning ability works in one of two ways, according to research conducted by Patricia Linehan from Purdue University. [<http://docs.lib.purdue.edu/dissertations/AAI9921102/>]

We classify our learning abilities in a given subject as "incremental orientation" - the belief that we can continually improve our ability by studying and practicing, or we think about our learning as an "entity orientation" - the belief that we can't get any better no matter how hard we try. One person can have different orientations for different subjects.

Entity orientation toward math - basically saying, "I'm not good at math and so I never will be" - is a dangerous thing. When someone with entity orientation about learning math gets a math problem wrong, they think it's just an indication of the poor math ability they were "born with," according to a study published in Personality and Individual Differences in 2010.

[<http://www.sciencedirect.com/science/article/pii/S0191886909003833>]

This can have a very negative impact on motivation. If we don't believe we can improve, we won't bother trying.

Research shows that hard work, not natural ability, is the most important factor.

The study mapped the progress of math ability in 3,520 students for five years - from grade five until grade 10. Students' math ability was measured by their performance on the PALMA Mathematics Achievement Test. Questions included basic arithmetic, algebra, and geometry. The researchers also asked the students to answer questions about their study habits and interest in math.

In the early grades, a high IQ generally meant a high math score. But it turns out natural talent will only get you so far. How students study made a big impact on how much their math ability improved. Students who simply relied on memorization when studying, and didn't attempt to make deeper connections with other areas of math, didn't show much improvement over time.

The researchers also found that where a student's motivation came from made a difference in their improvement. Students who said they wanted to get better at math simply because they were interested in the subject ended up improving more than those who wanted to get better in the interest of good grades.

"While intelligence as assessed by IQ tests is important in the early stages of developing mathematical competence, motivation and study skills play a more important role in students' subsequent growth," Kou Murayama, the lead researcher on the study, said in a press release.

[<http://www.sciencedaily.com/releases/2012/12/121220080443.htm>]

You can see the difference it made in the chart to the left. Students listed as high-growth believed they could get better at math the more they practiced and used in-depth study techniques. Students listed as low-growth were more likely to believe that math ability is something you're born with and it can't be improved, and they relied more on memorization when studying.

How can we change our attitude about math?

Not only do we hear "I'm bad at math" from our peers, but we're bombarded with messages that it's OK to be bad at math. For instance, there are shirts made for young girls that check off shopping, music, and dancing as their best subjects, but deliberately leave the box next to math unchecked. There are also shirts that say "Allergic to Algebra" and "4 out of 3 people are bad at math."

[<http://www.sltrib.com/sltrib/money/56698622-79/math-shirt-girls-stores.html.csp>]

There are math-specific learning disabilities like dyscalculia - sort of the math equivalent of dyslexia - but this kind of learning disability does not explain poor performance in math in the general population.

[<http://www.ncl.org/types-learning-disabilities/dyscalculia/what-is-dyscalculia>]

Psychologist Jonathan Wai said in a Psychology Today article that until we stop thinking being bad at math is funny, it will continue to be socially acceptable.

[<http://www.psychologytoday.com/blog/finding-the-next-einstein/201203/why-is-it-socially-acceptable-be-bad-math>]

Focusing on math as a skill, just like any other skill learned in school, could help increase our math literacy and encourage more young women and men to enter the field.

See also Stereotypes About Math Are Holding Us Back

[<http://www.businessinsider.com/stereotypes-about-math-hold-americans-back-2013-11>]