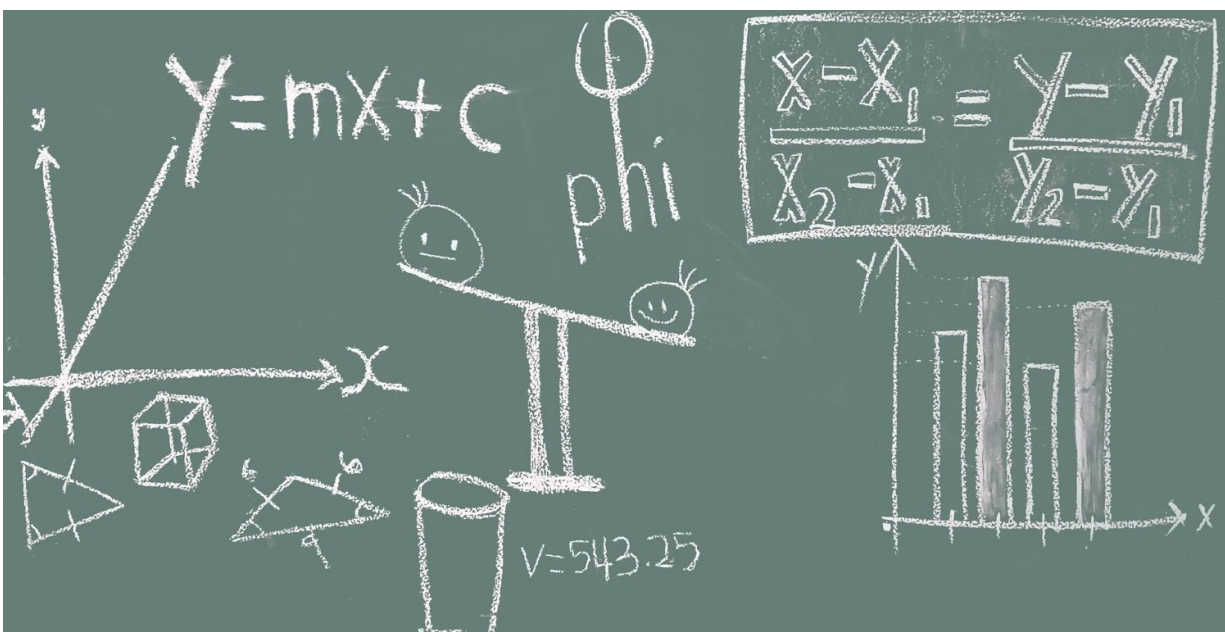


Study reveals the hidden ways math helps us in everyday life

July 12 2017, by Jeff Grabmeier



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A psychological intervention implemented to help students cope and learn more in a tough statistics course did more than just help them in the class, a new study found.

Researchers found the intervention helped students improve their math literacy - what scientists call '[numeracy](#)' - which was vital for success in the course.

But it also helped the intervention students, compared to students who did not get the intervention, demonstrate better [financial literacy](#) and make better health-related decisions during the semester they took the course, findings revealed.

"Improved math skills helped these students outside of [class](#)," said Ellen Peters, lead author of the study and professor of psychology at The Ohio State University.

"This study showed that knowing how to use numbers is important for everyone, even if you think you're not using math. Numeracy helps people in their everyday lives."

The study appears in the journal *PLOS ONE*.

The study involved 221 students enrolled in an undergraduate psychology statistics course at Ohio State that is required for all psychology majors.

"Many students are not huge fans of the class because of the math involved, but it is a requirement," said Peters, who is director of the Decision Sciences Collaborative at Ohio State.

The researchers wanted to see if a psychological intervention called values affirmation could help students succeed in the class by making them more comfortable dealing with the math that may intimidate them. The hope was that this would have a snowball effect, helping students in other areas of their life where numeracy is important.

Values affirmation has been shown in other studies to be helpful in a variety of educational situations.

Students first completed the values affirmation exercise near the

beginning of the course. They were given a list of six values (including relationships with family and friends, spiritual/religious values and science/pursuit of knowledge) and asked to rank them in importance to themselves personally.

Half the students affirmed their values by spending 10 to 15 minutes writing why their most important value was meaningful to them.

The other half of the students, the study's control group, took their least important value and wrote about why it might be meaningful for someone else.

The students repeated the exercise a second time right before their first exam.

This simple exercise had some impressive positive effects. The researchers found that students who participated in the values affirmation did significantly better on a test of their objective numeracy skills at the end of the course compared to their scores at the beginning. The students in the control group did not see improved scores.

Students also completed a questionnaire at the beginning and the end of the course that measured how good they thought they were at math and how much they preferred numbers over words. Results showed that students who completed the values affirmation showed no change in this subjective numeracy measure from the beginning to the end.

Researchers saw that lack of change as a positive development because those in the control group showed declines in how good they thought they were by the end of the course, presumably because of the stress and difficulties they faced in the statistics class.

While it may seem strange that a [psychological intervention](#) could help

improve [math skills](#), other studies have shown similar results. The key is that values affirmation reminds students of who they are and what is important to them in life. That, in turn, is thought to make them less stressed out about the math requirements and help them achieve some early successes in class, Peters said.

Those early successes then give students something to build on. "It has a snowball effect. Values affirmation is thought to help students get some early wins in class. That leads them to try harder and get more achievements and it creates a cycle of success," Peters said.

The success in improving numeracy was important. But Peters said she was most interested in seeing if a boost in the students' math literacy could help them in the real world. And the research found that it did.

Results showed that the better numeracy scores seen with the values affirmation led to students scoring higher on a financial literacy test. In addition, these students showed better health-related behaviors, intentions and habits (such as avoiding cigarettes and practicing safe sex) over the course of the class.

In contrast, students in the [control group](#) showed declines in both financial literacy and health behaviors from the beginning to the end of the semester, Peters said.

"We were able to show that numeric ability really matters outside of class. Math isn't just for people who want a STEM career. It is for all of us," she said.

Researchers also found that students who did the values affirmation exercise and showed better numeracy received better grades in the statistics class, had stronger intentions to take future math classes, and actually took more math classes in their college career. These results

were correlational, however, and without a total effect of the intervention on these positive results so that the researchers couldn't prove that values affirmation was the cause.

The researchers also examined whether the values affirmation and improved numeracy would improve financial outcomes, such as whether the students had an emergency fund. Similar correlational results were found, without a total effect, and Peters said more research is needed on this issue.

How can stronger numeracy skills help students make better health and financial decisions? While the answer to that question is beyond the scope of this study, Peters said evidence suggests people who are better at numbers also have a stronger understanding of probability and are less influenced by emotions in the moment. This helps them better understand the personal risk involved in health decisions such as smoking or having unprotected sex, so they make better choices.

Numbers are an important part of financial literacy and help people understand how mortgages and credit-card debt work, so it is not surprising that [math](#) skills help in this regard, she said.

Provided by The Ohio State University

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