NEWS | POSTED FEBRUARY 8, 2017

Students Who Enjoy or Take Pride in Math Have Better Long-Term Math Achievement

PRESS RELEASE / CHILD DEVELOPMENT: Embargoed for Release on February 8, 2017

PRESS RELEASE

Published
Wednesday, February 8, 2017
12:01am

Achievement Emotions and Academic Performance: Longitudinal Models of Reciprocal Effects

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Research has shown that students' learning and cognitive performance can be influenced by emotional reactions to learning, like enjoyment, anxiety, and boredom. Most studies on this topic have been done in labs. Now a new longitudinal study out of Germany investigates how students' emotions in a school context relate to their achievement. The study focused on achievement in math, which is not only important for education and economic productivity but is also known to prompt strong emotional reactions in students.

The study was conducted by researchers from the University of Munich, Australian Catholic University, University of Oxford, University of Reading, University of Konstanz, and Thurgau University of Teacher Education. It appears in the journal *Child Development*.

"We found that emotions influenced students' math achievement over the years," explains Reinhard Pekrun, professor of psychology at the University of Munich and Australian Catholic University, who led the research. "Students with higher intelligence had better grades and test scores, but those who also enjoyed and took pride in math had even better achievement. Students who experienced anger, anxiety, shame, boredom, or hopelessness had lower achievement."

The research was conducted as part of the Project for the Analysis of Learning and Achievement in Mathematics (PALMA). It included annual assessments of emotions and achievement in math in 3,425 German students from grades 5 through 9. Students were representative of the student population of Bavaria, which primarily includes youth from nonimmigrant White families, but represents a broad mix of socioeconomic backgrounds and both urban and rural locations. Students' self-reported emotions were measured by questionnaires, and their achievement was assessed by year-end grades and scores on a math achievement test.

The study also found that achievement affected students' emotions over time: "Successful performance in math increased students' positive emotions and decreased their negative emotions over the years,"

according to Stephanie Lichtenfeld, senior lecturer at the University of Munich, who coauthored the study. “In contrast, students with poor grades and test scores suffered from a decline in positive emotions and an increase in negative emotions, such as math anxiety and math boredom. Thus, these students become caught in a downward spiral of negative emotion and poor achievement.”

The study’s finding that emotions influenced achievement held constant even after taking into account the effects of other variables, including students’ intelligence and gender, and families’ socioeconomic status.

The results are consistent with previous studies showing that emotions and academic achievement are correlated, but they go beyond these by disentangling the directional effects underlying this link. Specifically, the research suggests that emotions influence adolescents’ achievement over and above the effects of general cognitive ability and prior accomplishments, the authors note.

The study’s authors recommend that educators, administrators, and parents work to strengthen students’ positive emotions and minimize negative emotions related to school subjects, for example, by helping students gain a greater sense of control over their performance. They also suggest that providing students with opportunities to experience success may help reduce negative feelings and facilitate emotional well-being, which can promote students’ educational attainment.

Future research on this topic could explore whether the pattern found here pertains to other age groups and academic subjects.

The research was supported by the University of Munich and the German Research Foundation.

The Society for Research in Child Development will hold its Biennial Meeting in Austin, Texas, April 6-8, 2017. Members of the media are encouraged to attend to hear presentations on the latest research. Those journalists interested in learning more about this year's conference, or obtaining a press pass, should contact hklein@srcd.org. Conference attendance is free for qualified press with advanced registration.

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Summarized from *Child Development*, Achievement Emotions and Academic Performance: Longitudinal Models of Reciprocal Effects by Pekrun, R (University of Munich and Australian Catholic University), Lichtenfeld, S (University of Munich), Marsh, HW (Australian Catholic University and University of Oxford),

Murayama, K (University of Reading), and Goetz, T (University of Konstanz and Thurgau University of Teacher Education). Copyright 2017 The Society for Research in Child Development, Inc. All rights reserved.