Teacher bias devalues math skills of girls and students of color, research finds

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New USC research into how teachers evaluate the mathematical ability of students suggests that white teachers and teachers of color alike have biases that favor white and male students.

The researchers asked two questions: First, when reviewing the work of

fictitious students, do teachers' ratings of students' abilities differ depending on the gender or race/ethnicity of students' names? And second, do teachers' own race, gender and educational backgrounds predict their implicit biases?

The study, published in the December 2019 edition of *Educational Researcher*, found that teachers evaluated students' performance equally along racial and gender lines but assumed that girls—and especially girls of color—had lower math abilities than boys and white boys. According to their findings, the lowest-rated group was always females of color.

"Our study suggests that even teachers affected by harmful stereotypes are not free of bias," said lead author Yasemin Copur-Gencturk, assistant professor of education at the USC Rossier School of Education. "The findings suggest that implicit stereotypical messages people may have received throughout their lives could lead them to internalize these messages."

White-sounding names were rated significantly higher

To conduct the study, the researchers selected math problems from across a decade of National Assessment of Educational Progress (NAEP) tests and surveyed middle school students for answers that included both the solution to the problem and the reasoning for that solution. Those answers were then assigned randomized combinations of student names associated with black, Hispanic and white girls and boys. All participating teachers then rated the same student work.

The results indicated that teachers evaluated the correctness of students' solutions evenly, regardless of a student's assigned gender or race/ethnicity. However, analysis of teachers' ratings of students'

mathematical abilities—based on each student's stated reasoning—revealed biases for partially correct and incorrect responses.

The study found that white-sounding names were rated significantly higher—both by white teachers and by teachers of color—than those of black- and Hispanic-sounding names. Non-white teachers' estimations of students' mathematical ability also favored white students—both boys and girls—over students of color, and white teachers' estimations of students' mathematical ability favored boys over girls.

"As educators and teachers, we need to disrupt this pattern by paying close attention to how our implicit beliefs might affect our students," Copur-Gencturk said.

Few studies have examined biases at the intersection of race and gender

Data for the study came from 390 mathematics teachers who participated in professional development activities provided by state-funded Mathematics and Science Partnership (MSP) programs from 2014 to 2017.

While the field of experimental psychology has done significant research on implicit bias, only a handful of studies have deployed experimental methods to examine teachers' implicit biases. Additionally, very few studies of classroom instruction have examined biases at the intersection of race and gender.

The authors suggest that their results may be consistent with previous studies showing that oppressed groups sometimes accept and perpetuate negative racial and gender stereotypes. In other words, teachers of color may be more critical of students of color because internalized

stereotypes may manifest as lower expectations for students of their own race. These stereotypes consequently have a negative impact on student achievement.

Similarly, female teachers may also have internalized sexism so as to perceive boys as more mathematically capable than girls.

"Students' perceptions of their academic ability are developed based on messages they receive from their social environment, especially those of their teachers and parents," the authors wrote. "These messages potentially contribute to their self-efficacy, self-competence and decision to select a STEM career."

Authors say teachers need more opportunities to overcome implicit biases

Noting research on how teacher-student racial match can be beneficial for students of color, the authors suggest that students of color may benefit even more from a teacher of color who does not have internalized stereotypes. The authors suggest this as a topic for future research, in addition to suggesting studies that examine the underlying reasons for teachers' implicit biases.

"To create equity in our school systems and society," Copur-Gencturk said, "we need to provide more opportunities for teachers and educators to overcome their potential implicit biases."

More information: Yasemin Copur-Gencturk et al. Teachers' Bias Against the Mathematical Ability of Female, Black, and Hispanic Students, *Educational Researcher* (2019). DOI: 10.3102/0013189X19890577

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