

Girls + Math = Gender stereotype?

Local schools say girls match boys in math test scores

By **LACEY SIKORA**
Contributing Reporter

The long-held stereotypes that female students lag behind their male peers in math performance or that female students do not enjoy math as much as male students have largely fallen by the wayside in Oak Park and River Forest schools. Representatives of District 97, District 90 and District 200 report that very little disparity exists between the sexes in terms of math performance.

Dr. Amy Warke, chief academic and accountability officer for the D97 Oak Park elementary schools, says that gender disparities in math have not been observed for years in the district. "Basically, we stopped cutting data by gender because there are no disparities by gender. We do continue to do spot checks, but there have not been any disparities with our local or state data in a number of years."

Warke does note that stereotypes may still exist around how the genders feel about math and says that a large focus of the district is countering stereotypes that may exist both in race and gender by using consistent messaging that D97 programming in STEM programming is for all students.

This fall, the district is partnering with the Oak Park Public Library on a community read of "Whistling Vivaldi" by Claude Steele. Among other issues, the book explores stereotypes of race and gender in standardized testing. Warke says the book provides insight into the threat of various stereotypes in education, and she encourages all of the community to join in reading it.

In River Forest, District 90 Director of Curriculum and Instruction Dr. Alison Hawley says that the district does not have a statistical analysis of data broken down by gender, but she believes the gender breakdown in math classes is roughly equal parts male and female. "I can say that in terms of different classrooms, we do see strong representation



PROBLEM SOLVERS: Amelie El Mahmoud (above), a sophomore, goes over math questions with teammates on the Oak Park and River Forest High School Math Team. Coaches actively recruit young women to join the team. (ALEXA ROGALS/STAFF PHOTOGRAPHER)

of girls in more accelerated math -- probably half or more than half in those classes."

District 90 Math Coach Nancy Mueller says that the schools have been very intentional about improving girls' interest in math. "We lean on Jo Boaler's work," she says of the Stanford University mathematics professor. "One

of the things she suggests to increase girls' self-efficacy is eliminating timed activities. Doing so can reduce anxiety. District 90 eliminated that practice in our math programs."

At Oak Park and River Forest High School, Julie Frey, the math division

See **GENDER** on **page 3**

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Choosing math: OPRF's math team actively recruiting young women

By LACEY SIKORA
Contributing Reporter

Sheila Hardin remembers being a student at OPRF and never having a female math teacher. After graduating and student-teaching at the school and with 24 years as a teacher under her belt, she says the school has made great strides in providing female role models in math. Now the OPRF Math Team moderator and A.P. Calculus teacher, she hopes this will play out in future generations of females feeling more at home in the field but acknowledges that it's still an uphill battle to recruit females for the school's math team.

"We are constantly worried about balance," she says noting that teachers help identify students who might be interested in the team. "It's not always the top students and not just honors students. It's the math interest we are looking for."

Senior Emma Lofgren says a number of factors played into her joining the math team last year. "All of my friends are on it, and my Tuesday afternoons were free." The A.P. Statistics student adds, "I really loved my math class last year, and my math teacher was the senior team coach of the math team."

In Hardin's experience girls are often more comfortable joining the team with a group of friends, and she says that activities like marching band can siphon off potential members during busy seasons. She is always happy to work with other coaches and to accommodate full schedules to get more females on the team. While upper level math classes are balanced in terms of gender, she says, "Pushing females into STEM beyond the classroom is the next level."

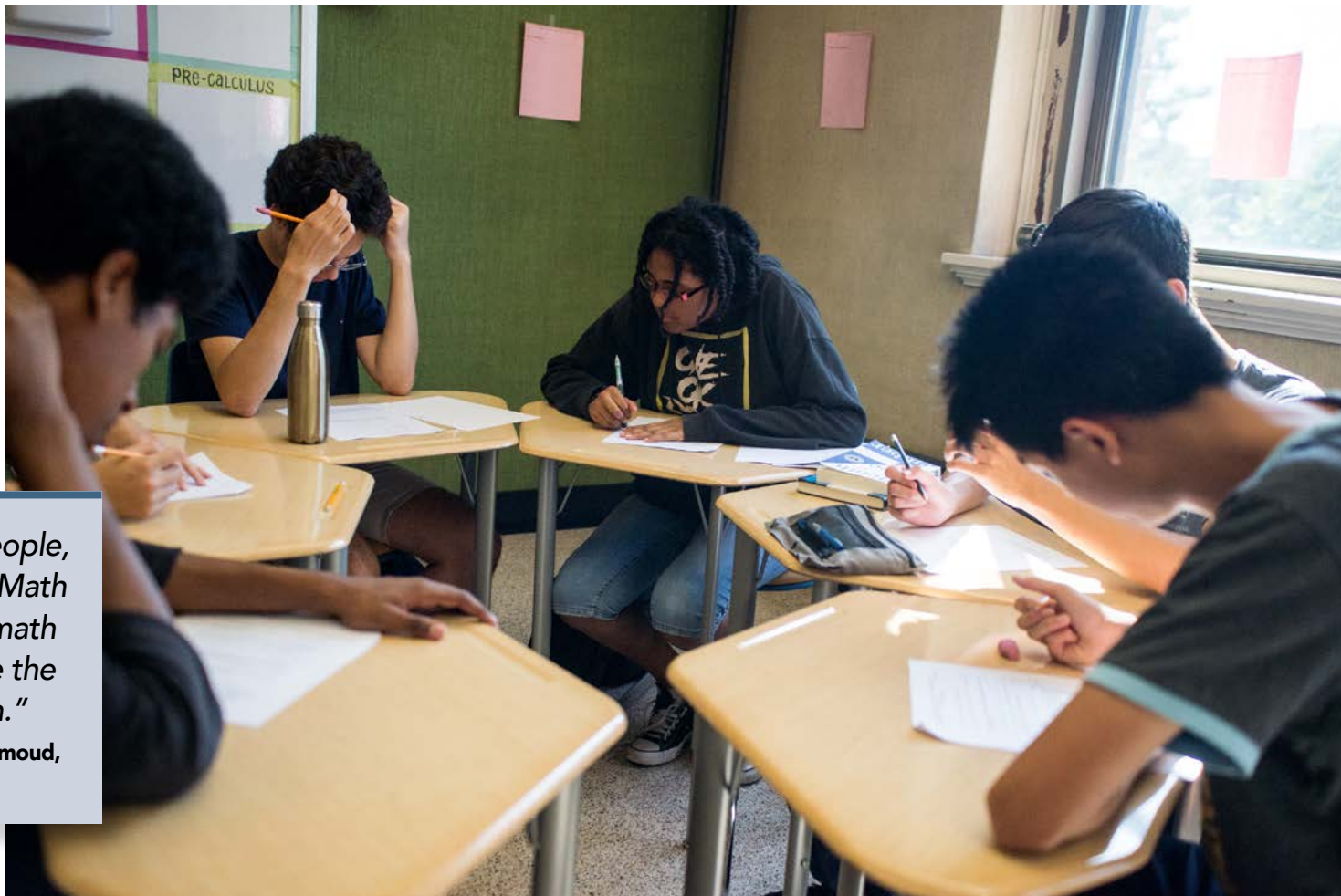
Sophomore Amelie El Mahmoud is one of those students who was initially drawn into math team by a friend while at Percy Julian Middle School. It has proven a good fit for her skills and personality. "I love the people, I love that math team makes math fun, and I love the competition."

Teammate Charlotte Reynnders, who hopes to work in a STEM field someday, also loves the competition and loves math. "I like going to meets and working under pressure. You also learn a lot of things on math team that you don't learn in math class."

Fellow sophomore Eleanor Siegel initially joined the math team at Brooks but soon left the

"I love the people, I love that the Math Team makes math fun, and I love the competition."

— Amelie El Mahmoud,
Sophomore



WELCOMING CIRCLE: A racially and gender diverse crew of OPRF Math Team members keep their heads down and do the work at a team practice. (ALEXA ROGALS/STAFF PHOTOGRAPHER)

team. She remembers the junior high team as "male-dominated and uncomfortable." She tried again in high school because she says, "I was ambitious and I wanted to get back into math and science." She enjoys team competitions, as well as problem solving.

For junior Rachel Taylor, the math team has enhanced her initial interest in the subject. "I've always liked math because you can analyze things from a logical standpoint." She joined the math team to find others who felt the same way about the subject. "A lot of people I know say they hate math, so math team is a great way to find people who like it too. It also really helps with my other classes."

For Taylor, taking her love of math outside of the classroom setting may pay dividends beyond high school: she is considering pursuing a career in mathematics.



SOLVE FOR X: Elenor Sigel, a sophomore, left, and Eva Pisabaj, a freshman, solve problems during a Math Team practice. (ALEXA ROGALS/STAFF PHOTOGRAPHER)

How race and income impact which students get enrichment

By **SIQBHAN NEELA-STOCK**
Contributing Reporter

Jeanine Pedersen, 60, doesn't have to choose between putting food on the table and paying for a private math tutor for her oldest daughter, 16, who is a junior at Oak Park and River Forest High School.

But this doesn't mean finances aren't tight in her family.

"You make choices and it [paying for a math tutor] meant that we didn't travel as much as we liked to and I don't get new clothes. To be honest, the shoes I have on my feet right now are cast offs from my kids," Pedersen said.

Pedersen and her husband have been paying for a private math tutor for her oldest daughter for the last three years of her daughter's high school career. They pay \$65 to \$80 an hour each week for a private tutor.

But the expense is worth it.

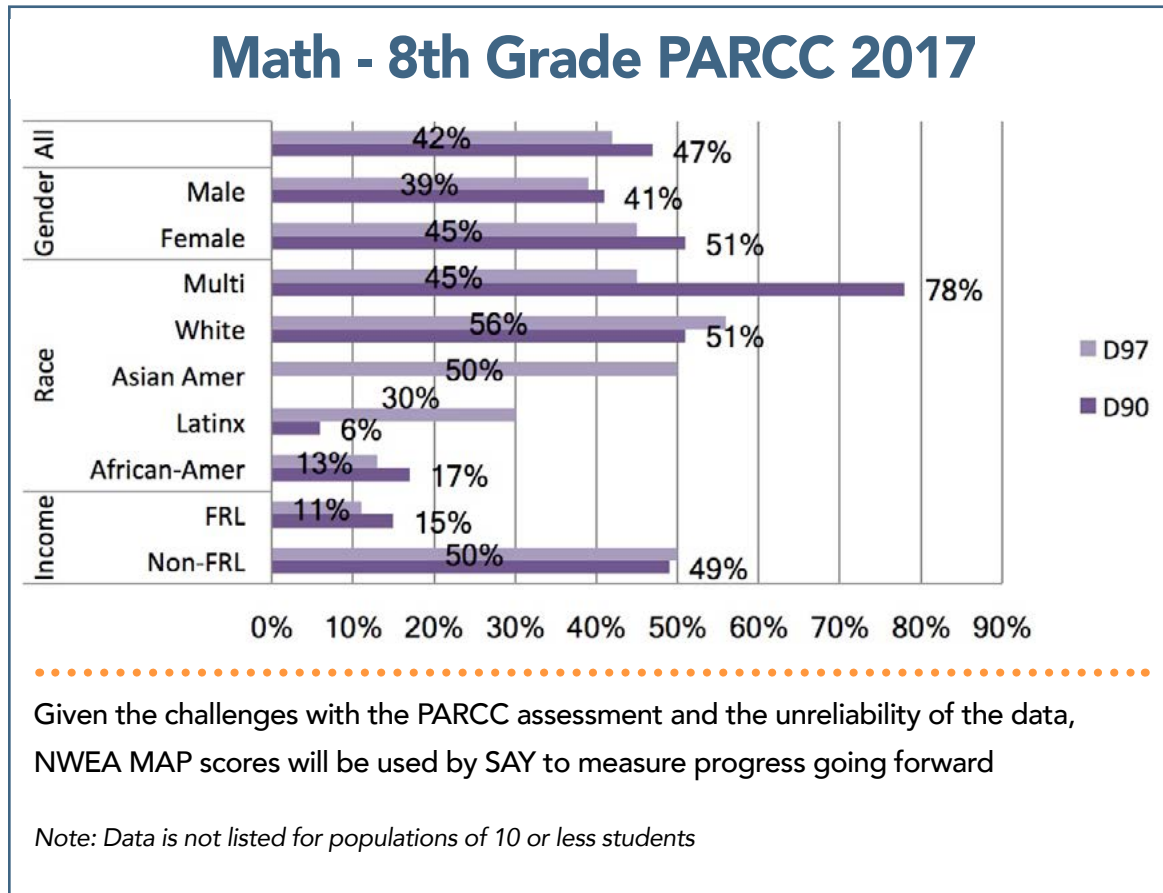
"She'll be able to finish calculus senior year, which means she won't have to take calculus in college and she'll be done with math," Pedersen said.

Cost calculations for enrichment are a real issue for many middle income and lower income families in these villages.

More often than not, parents of low-income status cannot afford extra resources, like private tutors, for their children. Race often plays a hand in this. Racial minorities, on average, earn less than their white counterparts.

Pedersen, who is white, believes economic status affects a family's ability to pay for extras like math tutors but she doesn't think race affects this.

"There are plenty of parents of color in Oak Park who are in the same financial



situation I am and they make the same choices," Pedersen said.

Julie Frey, the mathematics division head at the high school, agrees that a family's financial status affects the resources, like math tutors, they can offer their children and that this is related with the success of their child in a particular subject.

"There has been some research done on one-on-one math instruction and it

definitely will increase success in learning math. So, if a kid is getting private tutoring, research says they will have more success than the kid they're sitting next to that isn't getting private tutors," Frey said.

However, unlike Pedersen, Frey doesn't think race is a negligible factor.

Frey, who has held her role for the past nine years, says the U.S. education system was designed for and built by white

people and this legacy affects teaching today.

But she says the high school is trying to lessen this gap.

"Standards-based grading. The research on that shows the kids who benefit the most are kids of color," Frey said.

Standards-based grading evaluates students on units they have passed. A student will not receive a grade in a unit, like algebra, until they have mastered all

of the quizzes or tests in that unit.

"It tells kids that learning something isn't about some innate ability...I tell kids you can't fail, you can only quit," Frey said.

This type of instruction is a big shift, Frey said, but it's the route most schools are taking.

Frey said conversations around race and equity are constant among teachers.

There are also resources the high school offers that don't require parents to shell out extravagant sums of money so their child can get ahead in math.

"The tutoring center is open from 7 a.m. to 4:30 p.m. and through the entire day and it's staffed heavier in mathematical expertise than in anything else," Frey said.

She also refers parents to Khan Academy, which offers free online courses in a variety of subjects, and free online digital textbooks the school provides.

The school also offers summer school courses in math. During the 2018 summer session, the school charged \$185 per credit. The school has financial assistance for families who can't afford summer school, Frey said.

But to significantly lessen the gap between the success of low-income students and students with more financial resources when it comes to math, there needs to be an intervention in the third grade, she said.

"If a kid gets behind in third grade and then continues to lose ground, by the time they hit me they're four or five grades behind," Frey said. "So, the truth is that we as a society have to recognize how important education is. We all have to agree that all kids can learn."

GENDER

continued from page 1

head, notes that the school has made great strides to counter gender stereotypes in math and says that in almost every performance metric, females perform as well as males in math at the school. Gender balance when hiring teachers is part of this effort.

"We are really intentional about making sure our teachers represent the demographics of the kids. With our math teachers, it is probably about 50-50 male to female, and it's not just men teaching

higher level math. Our A.P. Calc teachers are 50-50, and the class makeup in A.P. Calc is roughly 50-50 in terms of gender as well."

She notes that while at the University of Illinois Chicago, she observed the Master's program in math was divided almost 50-50 between male and female students, but the PhD students were predominantly male. "The gender gap does still exist at this level and in engineering and computer science."

OPRF still has room to grow in terms of participation in some areas according to Frey. "A.P. Computer Science is almost all

boys. I just hired a female computer science teacher to try to get more girls to take that class."

She also notes that on the American Math Competition, an annual, national test for those in higher level math classes, very few students get to move on to the competitive level, and the majority of those are male.

Of that disparity, Frey says, "Obviously, I don't think there's any difference in intelligence between the sexes, but there could be some very small systematic bias or some stereotype that girls think math is not for them."



SHARP PENCIL: Silvia Gimbel hard at work on a Math Team practice test at OPRF. (ALEXA ROGALS/STAFF PHOTOGRAPHER)

Minding the math gap

District 97 finds ways to boost students of color into advanced math

By **MICHAEL ROMAIN**
Staff Reporter

Michelle Harton is a longtime Oak Park resident who worked as a senior staff engineer with Motorola for nearly two decades before becoming a high school math teacher.

For 13 years, she and her husband, Austin, facilitated Math Academy, a homemade Oak Park support group that offered hands-on math tutoring for dozens of African American students. The couple, both engineers-turned-educators, drilled into participants the importance of self-confidence and a sense of belonging.

"Of course, math acumen is important, but it's really important for any student, especially students of color, to believe that they can excel and that they can achieve," said Harton, a former District 97 school board member.

"When you believe that you can excel and achieve, it changes your whole academic experience," Harton said. "Stereotypes play a big role in students' perceptions of themselves."

LeeAndra Khan, the former principal of Gwendolyn Brooks Middle School, said that those stereotypes can be invisibly reinforced through curricular barriers, which may bar black and low-income students from being exposed to high-level math.

That's why, when she was hired in 2015, one of the first things she did was examine the district's process for allowing students to enter advanced math courses.

She found that some black and brown students were not able to progress into higher level math with their white peers — despite having similar test scores, which are major criteria for advancement.

"I wondered whether or not the district was keeping true to its own standards of entry," she said, "and I found that this wasn't the case."

There were clearly other factors influencing the selection process. One of them, Khan discovered, was parent advocacy. White students benefitted from having parents who were familiar with the rules of advancement and who were able to "subvert the process" to their children's advantage.

What some black and brown children at Brooks needed, Khan decided, was an advocate of their own with some insider awareness. That's what she would be.

"I bumped them up myself," she said.

One year after Khan left Brooks, the available data

'It's really important, especially for students of color, to believe that they can excel and that they can achieve.'

— **Michelle Harton,**

Former D97 school board member

suggests that her strategy may have worked. Although the gap in math achievement separating black and white students, as well as low-income and non-low-income students, at District 97 has diminished over the last three years, the contraction at Brooks has been even more pronounced.

Khan's radical intervention seems to have been a leading indicator of how

District 97 plans to address the so-called achievement gap between black and white students in the years ahead, particularly in math.

The idea that is gradually taking hold within the district, said Amy Warke, District 97's chief academic and accountability officer, is that achievement follows equitable access and opportunity, as well as uniform expectations.

Both Warke and Khan said that a student's ability

to perform advanced math often hinges on whether or not that student is exposed to advanced math in the first place. High performance follows exposure and exposure reinforces high performance.

"Generally, we decide that if a kid can't do one thing in math, then they can't do what's next," said Khan. "That's not true. Not every aspect of math has to be linear. Just because I don't understand fractions doesn't mean I can't understand solving the system of equations. Is the goal for students to demonstrate mastery on an exam or is the goal for them to get it?"

District 97 officials are thinking along these lines, as well. Warke said that the district eliminated a "bottom tier" math curriculum last year, automatically raising standards across the board for all incoming sixth-graders — regardless of "achievement" level.

"We ensured that all of our students are getting exposed to grade-level math or above," Warke said.

As a result, she added, the district saw a 7 percent increase in the number of students of color taking advanced math in sixth grade.

"Next year, those sixth-graders will be in the seventh grade and we're anticipating that the percentage will go up," Warke said.

Warke said that, in addition to eliminating low-level math curricula, the district has also implemented a variety of professional development procedures designed to identify implicit racial bias, and to promote cultural responsiveness, among teachers in the district. Officials have also taken steps to boost the number of minority teachers and staff in the district.

"All of these steps go to breaking down the stereotype [of low achievement among minority and low-income students]," Warke said. "It's about making sure every student knows that we know that they can do the work."

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JUMP STARTER: LeeAndra Khan, former principal of Gwendolyn Brooks Middle School, boosted a group of black and brown students into advanced math during her tenure at the school. (ALEXA ROGALS/STAFF PHOTOGRAPHER)