

# Study: Math fears discourage girls from PEMC fields

Lara Perez-Felkner  
Florida State University News

The belief that the ability to do difficult mathematics is something that you either have or you don't prevents many American girls from pursuing a college degree in the physical sciences, engineering, mathematics, or computer science (PEMC), suggests a new study by Florida State University researchers.

In short, schools, families and policy makers need to do more to change those misperceptions.

"Our results indicate the potential for more women to move into PEMC if they perceive their mathematics ability as strong and open to growth," said Lara Perez-Felkner, assistant professor of higher education and sociology in the College of Education at Florida State and co-author of the study.

It's been well documented that math-based fields in higher education and at the professional level are male-dominated. Perez-Felkner and doctoral students Samantha Nix and Kirby Thomas set out to determine how much a student's choice of a college major is influenced by gender and perceptions about ability.

The results were revealing.

Perceived ability in mathematics matters, in particular on difficult and challenging tasks.



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While high school boys tend to overrate their abilities in mathematics, girls tend to underrate them. They also found 12th-grade girls who reported being convinced that they could do the most difficult and challenging mathematics were about two times more likely to select a PEMC major.

Another important conclusion was the perception that mathematical ability can be developed through learning — or a "growth mindset." Girls in 10th grade who reported that they felt confident about this were more than two times more likely to take a PEMC major.

The findings held true even after correcting for other factors such as the science courses they took at

high school, ethnicity, college entrance exam scores and the selectivity of the college.

"By focusing on student's perceived ability under challenge, we are getting closer to the 'real' world context, where mathematics anxiety may operate," Perez-Felkner said. "Most people believe they can do some mathematics, such as splitting

a dinner bill with friends, but fewer believe they can do mathematics they perceive as 'difficult.' The research shows that this belief can influence the decision to specialize in mathematics-intensive fields, for both women and men."

To conduct the U.S. National Science Foundation-funded study, researchers examined a group of 4,451 students from 752 high schools across the United States and followed them from 2002 to 2012 using the records of the Education Longitudinal Study of the U.S. National Center for Education Statistics.

These findings, published in the journal *Frontiers in Psychology*, have direct implications for policy.

They suggest that interventions that foster a growth mindset of mathematical ability could be effective in raising the number of women that pursue a career in PEMC fields.

Currently, women are strongly underrepresented in these fields, as shown by recent reports by the Organization for Economic Co-operation and Development and the U.S. National Science Foundation.

This gender gap is bad news for everyone: Science and society lose talent, while women miss out on potential careers with higher-than-average income and job stability.

"It is important for the U.S. and other na-

tions to continue to invest in interventions to end gender segregation in PEMC sciences," Nix said. "For instance, students may need to hear that encountering difficulty during classwork is expected and normal and does not diminish their ability to become a successful scientist. In addition, instructors may want to ask themselves if they are giving the same feedback to young women and men who deal successfully with a difficult mathematics problem in class."

Other results include:

- » Women were almost four times less likely to major in PEMC than their male peers.
- » Women were almost four times more likely to major in health science than their male peers.
- » Girls and boys who had completed both Physics 1 and Chemistry 1 courses in high school were almost twice as likely to major in a PEMC field than their peers, and two-and-a-half times more likely if they had completed both Physics 2 and Chemistry 2.
- » As a group, girls in 10th grade scored significantly lower than boys on an index that estimated their growth mindset of mathematics ability.
- » As a group, 10th and 12th grade girls believed less in their ability to do difficult math than boys of the same age.



Reading mentor and a student work to improve comprehension at Ruediger Elementary. PROVIDED BY YMCA

## Volunteers help students improve with YMCA Reads

Margi Henson  
Special to the Democrat

With a common verbal cue teachers often use to get their students' attention, Lauren Sima tells those in her YMCA Reads class it's time to listen and get to work to improve their reading skills.

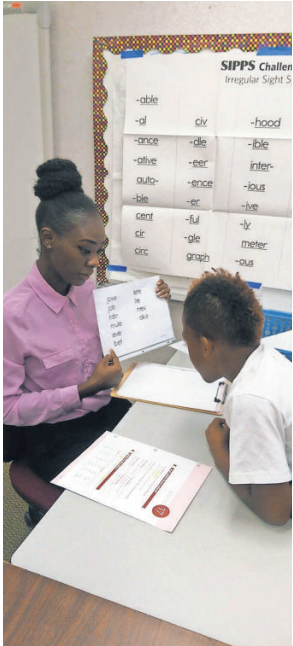
"Bubble in your mouth," she says.

As the site coordinator for YMCA Reads at Ruediger Elementary School, Sima understands the enormity of the job because her students are in the bottom quartile of reading.

YMCA Reads is a volunteer-driven program that uses a prescribed curriculum to provide free tutoring to students who are not proficient in reading. Students in grades 1-3 are referred by their teacher and attend after school Monday through Thursday.

YMCA Reads, which has been around for 10 years, has been implemented at 39 sites sponsored by 14 YMCA associations in the state. The program at Ruediger is the first site for Tallahassee and is sponsored by Capital Region YMCA and grant funded by the Department of Education.

"For our YMCA to be engaged in such a life-changing effort with students at Rue-



Reading mentor uses curriculum material to work with a student. PROVIDED BY YMCA

diger fulfills our promise to support activities that promote youth development, social responsibility and crucial outreach to our community," CEO Ray Purvis said.

Sima said her background in elementary education and six years of experience in the classroom to plan individualized lessons for her students to target their reading needs. Her mentors are trained in delivering the lessons as well and work patiently with students to help them gain confidence in reading.

"We are proud of all our students," Sima said. "We have had such a positive reaction from one child in particular who has struggled behaviorally and academically in school. We encourage him and give feedback on how he's growing in reading to show that he is capable of great things. His demeanor towards the mentors is positive and respectful. He was even upset when we had to cancel the program for two days. He is now attending our summer session."

"We are delighted to be piloting YMCA Reads at Ruediger, especially since it supports our commitment to making sure our youngest children learn to read proficiently by the time they finish second grade," Ruediger principal Sally Stephens added. "Participating students receive an extra six hours of support every week through intensive reading intervention systems. In August, we hope to pick up where we left off and implement the program for the entire 2015-2016 school year. YMCA Reads remains a top priority."

For more information about YMCA Reads go to <http://www.ymcareads.com> or like us on Facebook.

### Life skills

# Club involvement an important opportunity for students to grow

Monica Brinkley  
UF/Cooperative Extension

With summer here, you might be asking, "What am I going to do with my children while they are out of school?" One solution is to get them involved in a club. 4-H is the youth organization of the Land Grant University System, of which the UF/IFAS Extension Service is a part. 4-H and other clubs offer many benefits to youth who participate. Plus, an County Extension office is located in each of Florida's 67 counties!

For many children, they need to get out and do something. Research has pointed out many negative effects of spending too many hours in front of a television or on the computer. It is much healthier to be actively involved in activities, especially with other people.

Club activities can be a beneficial way to spend time. Plus, clubs offer a wonderful opportunity for children to meet new people and make new friends. Often, 4-H clubs are centered on a specific project or topic. Therefore, friendships or acquaintances are built around a common interest.

Life skill development is one of the greatest advantages of belonging to a 4-H club. Self-confidence grows as a result of obtained life skills. Here are the four life skill areas and how the club leaders address the life skills through club involvement:

4-H Life Skill Area Targeted Life Skills:

- » **Head (thinking):** Critical thinking, problem solving; Use team-based activities with positive interdependence such as creating a group presentation on livestock disease;
- » **Head (managing):** Goal setting, planning/

organization, wise use of resources, keeping records, resiliency; Assign individual roles such as leader, recorder, or materials manager to meet group goals;

- » **Heart (relating):** Communications, cooperative, social skills, conflict resolution, accepting differences; Provide youth with a means to assess group work skills and reflect on student performance independent from the other learning objectives;
- » **Heart (caring):** Empathy, sharing, nurturing relationships; Create long-term groups youth work within to share materials such as textbooks or tools;
- » **Hands (giving and working):** Contribution to group, teamwork; Successes and failures are shared by all members equally. Individual members can be randomly selected for assessment that will reflect on the knowledge/skills of the entire group.

Many clubs have a great emphasis on teamwork. Members are encouraged to work toward a common goal. This can be done in a variety of ways including commu-

nity service, group projects, or during camp, just to name a few. Youth develop independence as they gain these skills to carry throughout life.

Last, but not least, leadership and responsibility can be obtained with club involvement. Youth are allowed to make their own decisions, elect officers, and learn to lead, follow, and carry out their responsibilities.


What better way to learn these skills during their childhood in a safe environment than through club involvement in 4-H or other youth organizations? If your child is not involved in a club, use the summer to see what is offered in your community that will meet your family's needs.

If you are interested in learning more about 4-H, go to [florida4h.org](http://florida4h.org).

Monica Brinkley has served as an Extension Agent since 1985 in Jackson, Calhoun and Liberty Counties. She currently is the County Extension Director, Family and Consumer Science, and 4-H Youth Development Agent. Contact the University of Florida IFAS - Liberty County Extension office at 850-643-2229, weekdays 8 a.m. to noon or 1 to 5 p.m.

PREVENTIVE CARDIOLOGY & INTERNAL MEDICINE ASSOCIATES

**PCAIMA Welcomes Dr. Ramel Failma, MD**



Dr. McCauley, Dr. Rahangdale, and Dr. Failma

**Dr. Failma, MD, is joining PCAIMA in June 2015.**


He is accepting new patients ages 16 and above.

Dr. Failma completed his residency in Family Medicine at TMH in 2006 & has practiced in Tallahassee since. He is accepting new Commercial BCBS, Cigna, Aetna, and UHC, as well as Capital Health Plan and Medicare PPO insurances.

**For an appointment please call 850.210.0593**

**PREVENTIVE CARDIOLOGY & INTERNAL MEDICINE ASSOCIATES**

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