

Parents' reactions while helping with math shape young children's achievement

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As educators and industry mull strategies for attracting more young adults to math-oriented professions, a new study in the journal *Child Development* suggests that children's early experiences doing math

homework and activities with their parents shape their motivation and achievement.

Cultivating a love of mathematics in [young people](#)—and inspiring the next generation of scientists, accountants and other numbers-oriented professionals—may start with low-stakes [math](#) activities that enable [parents](#) to feel effective at teaching math to their children and promote enjoyable parent-child experiences, say researchers at the University of Illinois Urbana-Champaign.

When math [homework](#) with their parents is fraught with negativity such as parental feelings of frustration or ineptitude, children are less likely to enjoy math and tackle challenging math problems. These children also score lower on math achievement tests a year later, according to U. of I. graduate student Jiawen Wu and psychology professor Eva M. Pomerantz.

"Parents' involvement in math activities such as games was more constructive than their involvement in children's homework" because parents' affect—their emotions and [emotional expression](#)—was more negative in the homework context, said Wu, the first author of the study. "Negative affect—such as feelings of irritation—predicts children's lack of motivation and lower achievement over time."

Although many studies have explored parent-child dynamics in the context of children's homework, little is known about such dynamics surrounding math, Wu said.

The study was co-written by Michael M. Barger, a professor of educational psychology at the University of Georgia; and U. of I. graduate student Dajung (Diana) Oh.

For 12 days, more than 480 parents of first or second grade students

reported on their involvement in their children's math activities and homework. Each day that they helped with these tasks, the parents used online surveys to rate how happy and content or irritated and anxious they felt during these homework and activity sessions. The parents also completed a survey that assessed how self-confident and efficacious they felt when helping their child learn math.

The majority of the parents, 80%, were the children's mothers. Sixty-seven percent were white, 17% were Black, 8% were Asian and 5% were Latinx. About 29% of the parents had less than a college degree, while 38% of the parents had advanced degrees.

According to the parents' reports, their children engaged in math homework or learning activities on about three of the 12 days, with the parents helping them about 80% of the time with each. First grade students performed more learning activities, while second grade students had more homework assignments, the researchers found.

About 30 days after the study began, and again a year later, the researchers assessed the children's liking for math and their preference for challenging math by asking them to create a worksheet by choosing from sets of easy and more difficult problems. Their math knowledge, calculation skills and quantitative reasoning were evaluated with an achievement test.

The more efficacious parents felt while helping their children with math, the more math homework and learning activities their children engaged in, the researchers found. Constructive parenting behaviors such as supporting the children's autonomy and encouraging them to solve math problems in their own way were associated with higher levels of parental efficacy too.

While greater levels of efficacy predicted positive emotions and

expression in both the math homework and learning activity contexts, the effect was stronger with homework, according to the study.

"We know that when parents have a lot of [negative affect](#) in the homework context, it's really not good for children," Pomerantz said. "Researchers as well as others have suggested that maybe we haven't taken advantage of parents as a resource for children's math learning. So it might seem useful to get them more involved in their children's homework and have the parents do some of the teaching."

Yet the demands and perceived high stakes associated with children's homework—such as pressures to finish it on time, receive good grades and parents' unfamiliarity with computational approaches that differ from those they learned as children—can make these sessions stressful for everyone.

"Educators might consider ways of relieving that pressure, whether that's assigning a different kind of homework or conveying to parents that the assignment doesn't have to be correct, that children are going to receive credit for turning it in," Pomerantz said.

Participating in fun, low-stakes math activities could be fruitful, cultivating parents' confidence in their ability to help their children learn math while instilling in young children attitudes that math is enjoyable rather than intimidating and offers intriguing intellectual challenges.

During students' early elementary school years, cultivating parental efficacy could be as simple as telling the parents that even if they don't think they're very skilled at math, they are still capable of supporting their [children's](#) learning, Pomerantz said.

"Telling parents that just sitting with your child, encouraging them and helping them develop a strategy is sufficient. You're going to struggle

sometimes, and that's OK," she said.

More information: Jiawen Wu et al, Parents' daily involvement in children's math homework and activities during early elementary school, *Child Development* (2022). [DOI: 10.1111/cdev.13774](https://doi.org/10.1111/cdev.13774)

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