HealthDay
News for Healthier Living

Print This Close Window

Preschoolers Don't Need Math to Do Math

They already have good grasp of how much is 'more' or 'less,' study shows

By Steven Reinberg
HealthDay Reporter

WEDNESDAY, May 30 (HealthDay News) -- Five-year-olds can come to approximate solutions for addition and subtraction problems even before they formally learn arithmetic, a new study suggests.

"Children do not need to be taught the logic of symbolic addition and subtraction in order to perform approximate symbolic arithmetic," concludes lead author Camilla Gilmore a research fellow at the University of Nottingham in the United Kingdom.

In the study, the youngsters easily solved "more vs. less" questions that did not ask for an exact number as an answer. This means that "children's difficulty with learning school arithmetic may stem from the need to produce an exact number when solving problems," Gilmore said.

Her team published the findings in the May 31 issue of *Nature*.

The researchers built on previous work to see if children could use basic concepts about "more" and "less" to solve math problems -- without the pressure of getting an exact amount.

"Recent studies of human infants and young preschool children and even non-human animals show that as long as you don't require exact calculation, animals and young children can represent approximate numerical values," said lead researcher Elizabeth Spelke, a professor of psychology at Harvard University.

In the study, Spelke's group gave a series of problems to 5-year-olds. The problems were presented as hypothetical scenarios involving the approximate addition and subtraction of large numbers.

For example, in one task, the youngsters were first told that "Sarah has 21 candles" and then that the girl received 30 more. Next, they were told that "John has 34 candles." The children were then asked: "Who has more?"

Although the children had not learned symbolic arithmetic, they were able to master the processes of addition and subtraction to come up with the correct answers to these types of queries, Spelke's team found. In fact, the 5-year-olds were able to solve the problems above and beyond what would be expected from them by chance alone, and without guessing.

"These findings invite teachers and parents to explore this capacity that children have, which we didn't know that they had before," Spelke said. "Not only to recognize symbolic numbers but be able to add and subtract them approximately. This could be an extremely useful ability for children, and it could prove to be a good hook to get kids interested in mathematics."

The children performed well in both in a quiet laboratory setting and in the classroom. However, performance was lower in the distracting classroom environment, Spelke's group noted.

One expert said it's unclear what all this means in terms of improving children's math skills.

"The findings suggest that young children's understanding of symbolic math forms may be much richer than was previously thought," said Nicole M. McNeil, an assistant professor of psychology at the University of Notre Dame. "However, I think the jury is still out in terms of both the processes that underlie this symbolic competence and the implications for instruction," she said.

"It may be the case that children benefit greatly from lessons designed around their early competence," McNeil said. "However, it is also possible that the approach could simply result in a greater divide between informal and

formal knowledge. This outcome may be undesirable, because much of mathematics involves written mathematical symbols," she said.

But Spelke believes the findings point to kids' innate abilities.

"Learning arithmetic in school is a very difficult task for children," she said. "But kids are really smart, smarter than you know and often smarter than they themselves know. Building on their abilities to get them to learn new things is a wonderful task," she said.

More information

The Ambulatory Pediatric Association has advice on building a child's **preschool and school skills**.

SOURCES: Elizabeth Spelke, Ph.D., professor, psychology, Harvard University, Cambridge, Mass.; Camilla Gilmore, research fellow, University of Nottingham, U.K.; Nicole M. McNeil, Ph.D., assistant professor, psychology, University of Notre Dame, Ind.; May 31, 2007, *Nature*