

Playing the Numbers: Music beats math anxiety, studies find

April 2 2010, by Karen Sottosanti

(PhysOrg.com) -- A mother walks her fussy baby around the house, singing and patting his back in time to the lullaby. She might not know it, but her rhythmic patting is her baby's first experience of patterning, a mathematical concept linked to more advanced math such as algebra. Can a child so young really respond to a lesson about math? Yes, say Ohio University professors Gene and Kamile Geist. The two have spent the last few years collaborating on research that shows that music can help children to interact with their world mathematically from a very early age.

“[Music](#) stimulates the brain in ways that nothing else can,” says Kamile Geist, an assistant professor of [music therapy](#). “Creating and reacting to a steady beat is innate. The patterns within different rhythms and melody lines enhance an infants’ level of awareness and promote active engagement immediately.”

Most teaching aids for patterns are visual, says Gene Geist, an associate professor of early childhood education. “But the early patterning experiences for babies are auditory,” he says. “Auditory patterning is easier for young children to grasp.”

Despite this early affinity for patterning, he says, many young children do not have a stimulating math environment at home, especially if parents have only a high-school level of education or less and/or are struggling financially. “Children who come from economically disadvantaged homes tend to struggle in a lot of academic areas in

school, but especially in math,” he says.

This might be because their overworked parents have little time to spend on enrichment activities, Kamile Geist says, adding, “Music can bridge the gap between the parent and the child. Our hope is that we can develop a music protocol that would be easy for parents to do with their children in the home. This way, a preschool child will have a more stimulating environment.”

In 2007, the Geists conducted a pilot study at the Ohio University Child Development Center in which songs were used to teach 3- and 4-year-old children about color patterns. The children liked the song and were heard to spontaneously sing it days later. When they were asked about it, the children were able to explain the patterning concepts that the song taught.

In other studies, the Geists have found that, due to the way schools have for many years taught math—repetition of tables, timed tests—many Americans see math as boring, anxiety-inducing, and unconnected to real life. The Geists hope to change these perceptions when they begin to assess “math anxiety” in the parents and teachers of children attending Head Start schools. The study will include training meant to counteract many teachers’ reluctance to teach math. The Geists expect that the teacher training would help keep children from inheriting negative attitudes about math from their teachers and parents.

The two-year study will focus on teachers in Head Start schools in the Athens area. “Head Start is a really nice place to go because they also have outreach to the community and to the home,” Kamile Geist says. In a previous study, in collaboration with students in the Ohio University Early Childhood Education program, the teachers helped develop math activities for children 3 to 5 years old. The teachers and university students discovered that the children liked best the activities that

included music, and the teachers became more eager to teach math in the classroom.

The results of this study led the Geists to begin developing a program called MathSTAAR, which would provide empowering training to teachers in Head Start schools. The teachers would learn to use music to teach math to pre-school [children](#). Parents would also learn about the importance of supporting math at home and would be shown ways to do just that, say the researchers, who are now seeking funding for the project.

The end goal of all of the Geists' studies is to help American parents realize the importance of math. "Thirty years ago, there was a similar problem with reading," Gene Geist says. "That became a big national concern. Now there are programs that teach parents to read to their kids. We are hoping math will go the same way—that people will say that math is important and that there will start to be an emphasis on it."

Provided by Ohio University

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