



The development enhancing features of math play-learning

What is this research about?

Play for children can be a form of learning. There are many different types of play. Purposeful play is a type of play that involves active adults' engagement with their children. The role of the adults is to enhance the possibility of learning through play by engaging with the child in activities the child is either doing spontaneously or activities that the parent guides. In doing so, adults (such as parents or caregivers) can potentially support the development of cognitive and emotional skills in kids. Math play encompasses number sense, patterning, and geometry, among other strands. What are the features of purposeful play that can potentially enhance a child's math development?

What did the researcher do?

23 children aged 33 to 41 months were selected for the study. They were chosen from a larger sample originating from a long term study on the role of adult talk in the development of children's number sense.

The researchers held 23 play sessions between parents and their children that lasted 30 minutes each. The sessions occurred in the child's home environment and were videotaped. Parents were also given demographic questionnaires to complete that included questions about their child's activities. They were not briefed on the study's topic of math play until after the end of the data collection.

What you need to know:

Young children can benefit from an adult's use of development enhancing features by laying down foundational math knowledge through 'play'. These features include: reinforced learning, checking for understanding, and advancing learning. More research is needed to assess how these features can be used to increase successful math learning opportunities, especially amongst diverse populations.

Parents were given a set of toys that included: small counting artifacts, soft blocks, puppets, number and shape blocks, shape sorters, foam shapes and large foam dice. The last task in each of the sessions involved a research assistant asking the young child to count hand-sized connected fish toys.

The sessions were transcribed and coded for analysis. The researchers focused specifically on number sense skills (counting and identifying numbers) and sought out potential trends that emerged between children and parents during math play.

What did the researcher find?

3 features of play emerged between children and parents that can potentially enhance math development:

- 1) Reinforced learning

This involves affirming the knowledge that a

child demonstrates. It includes strategies like praise and repetition. Some children were able to identify the numbers on each side of a numbered die, while others counted (or attempted to count) the dots on the dotted die. The researchers found that positive reinforcement and repeating the child's final response during play was helpful to support math learning.

2) Checking for understanding

This involves asking questions that assess or confirm what the child knows. Children played with animal and vehicle counters that allowed them to engage with spontaneous counting and cardinality. Parents looked for cues to ask follow up questions that checked to see how much their child understood his or her counting.

3) Advancing learning

This involves actions that advance a child's understanding beyond what he or she currently knows. Children played with large foam dice during the play session. Parents who were advancing learning were seen engaging their children in counting tasks and prompting children to think about the next number in the counting sequence. They were also seen engaging in other math such as adding. This learning was just beyond what the child currently understood and thus it helped the child learn more of the numeracy concept.

How can you use this research?

This research may be useful to any adult that interacts with young children. This includes families, caregivers, early childhood educators, and teachers. It sheds important insight on the importance of integrating math learning through purposeful play.

Policymakers may also use the study's findings to invest in future opportunities for children to build math skills at an early age. This may include

developing resources and support materials to train both families and teachers on how to build math skills via play, prior to children starting school. It may also help to further address the gap in math skills that may emerge in children as they grow older.

About the Researchers

Donna Kotsopoulos is Associate Professor and Associate Dean for the Faculty of Education at Wilfrid Laurier University. She is cross-appointed to the Faculty of Science, Department of Mathematics. dkotsopo@wlu.ca www.wlu.ca/mathbrains

Joanne Lee is Associate Professor of Psychology for the Faculty of Science at Wilfrid Laurier University. jlee@wlu.ca www.wlu.ca/childlab

Citation

Kotsopoulos, D., & Lee, J. (2013). What are the development enhancing features of mathematical play? *An Leabh Og: The OMEP Ireland Journal of Early Childhood Studies*, 7, 47-68. Available online at: <http://www.researchgate.net/publication/250917003>

Keywords

Learning, Mathematics, Number, Parents, Play

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