Counting on Each Other

Math Learning at Home and at Preschool

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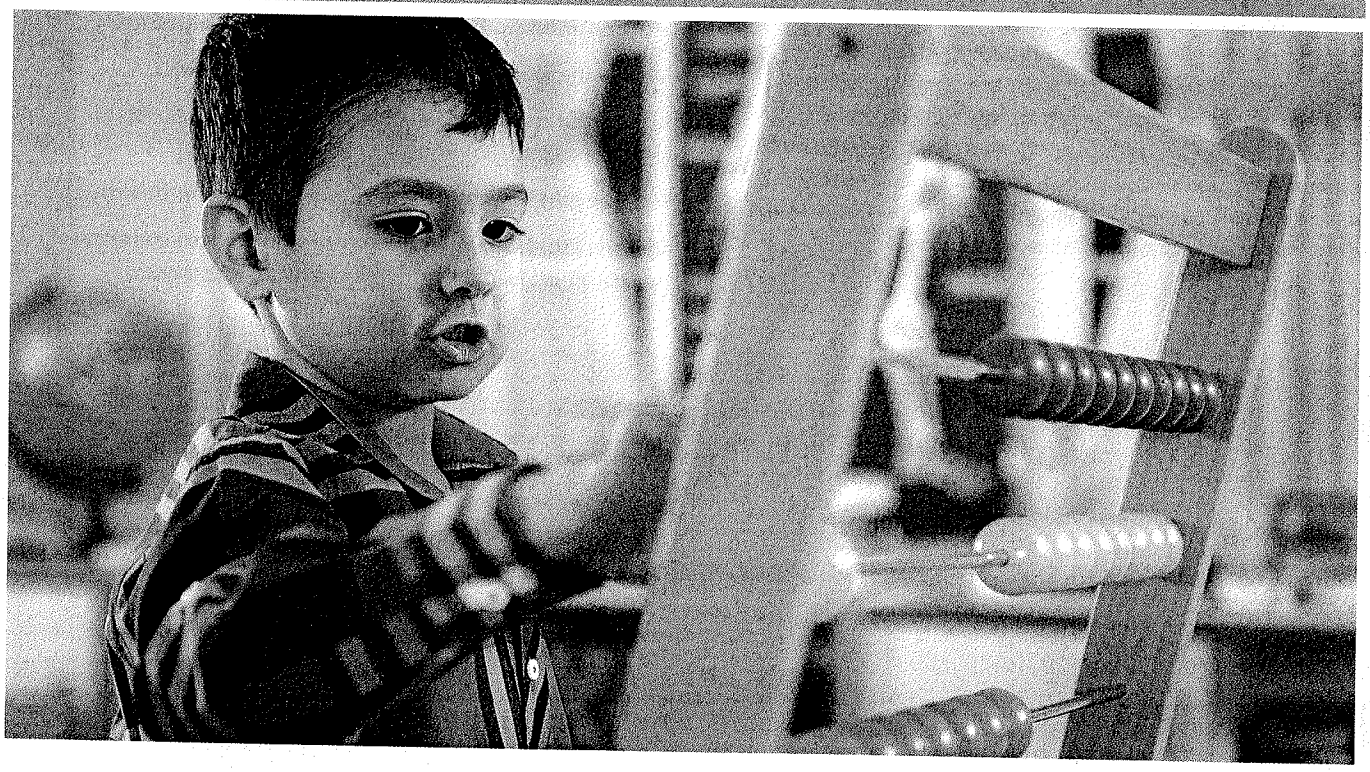

Children are born with an incredible capacity to learn about mathematics and numbers, and their play can be naturally mathematical (counting, sorting, building, comparing, measuring, etc.). Most children come to preschool with some counting ability. Adults may believe that a young child understands numbers when they hear the child counting. However, the child may only be engaging in *rote counting*—that is, reciting numbers without any real understanding of the underlying quantity, similar to reciting a poem, a rhyme, or the alphabet.

Counting is more than just reciting numbers—it is a very important foundation for mathematical learning and future success in mathematics! There are five aspects to counting (Gelman & Gallistel 1978):

1. **Objects should be counted *only once*.** Counting objects twice means that children do not have an understanding of the one-to-one correspondence between an object and the number.

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2 **Numbers have a stable order.** When children count, the string of number words has a stable order (e.g., one, two, three, four, five).

3 **Any set of objects can be counted.** Adults do a very good job of counting different objects with young children. However, some children may not fully understand that everything in their environment can be counted.

4 **The last number counted represents the total of the set.** The cardinality, or total, of the set is a tricky concept for young children. A child may accurately count a set of objects without repeat counting. She may recite the counting words in the right order. However, when you ask the child "How many?," she may not understand that the last number word she said was the total of the set. Instead, the child may give you the next counting number, her age, or any other number!

5 **You can start counting the objects in a set at any position in the set and still get the same number.** The order of counting objects is irrelevant because the number of objects in the set does not change, despite where you start counting.

To be sure a child is engaging in these five aspects of counting, preschool teachers can ask themselves the following questions:

- Does the child consistently say the numbers in the right order?
- Does the child count objects without repeat counting?
- Can the child answer the question "How many?"
- Can the child give you the correct number of objects when asked?
- Does the child understand that anything can be counted?
- Does the child understand that we can start counting at any object in a set and still get the same number?

Strategies for Supporting the Development of Counting

Count everything and anything. Counting can occur during play or during everyday routines. It can happen inside or outside, during snack time, or during cleanup!

Use your fingers to show numbers and to point. Fingers are an easy tool to help young children with counting—use your fingers to show quantities (two fingers for two blocks) and to point to quantities.

Ask children, "How many?" There are two strategies that help children understand "how many": (1) you start by saying the total, and then the children count; or (2) you repeat the final number after the children count. In either method, the importance of the final number is emphasized.

Use number words. Number words help children learn about numbers. Add quantities into your requests and your descriptions (for example, "Can you bring me two socks?").

First this, second that. Adults often use this sort of sequencing with children—"First we clean up, and then we have snack." Consider replacing the "and then" with *second, third, fourth,* etc., and holding up your fingers to show the progression.

Read number books. There are many great children's counting books that provide opportunities to practice counting. Initially, a focus on books that count forward is recommended.

Engage in other mathematical concepts using numbers. Counting is not the only type of number activity. Children can use numbers to compare quantities, measure, and estimate amounts.

Play games. Board games (e.g., Chutes and Ladders) and other types of toys, such as blocks, can be used to practice and encourage counting.

Name it, show it, touch it, say it, move it. Sometimes young children need help organizing a set of objects to avoid repeat counting. One strategy is to *say* the number, *show* the number with your fingers, *point* at the object, *say* the number again, and then *move* the object a small distance away from the other objects. Repeat this until all of the objects in the set have been moved. This strategy helps re-create the set of objects so that it is easier for children to see which objects they have already counted.

If a child can do all these things consistently—first with smaller sets of objects, then up to five objects, then up to 10 objects—he is showing he has an understanding of numbers beyond rote counting and is ready for more challenging mathematics. Picking up on mathematical moments during play—without taking over the play—to support the child's emerging understanding of numbers is important. There are a number of strategies that might help preschool teachers and can be shared with families. (See "Strategies for Supporting the Development of Counting," and share the tips with families.)

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It is important to communicate with families about the kinds of counting abilities a child is demonstrating at preschool and the mathematical learning happening in the preschool classroom. This enables parents to support mathematical learning at home and encourages them to share with you what they see during their everyday interactions with the child. Parents can be important partners in helping young children engage in counting and in mathematics. Let's collectively count on each other to support young children's mathematical development. TYC

SUPPORTING DUAL LANGUAGE LEARNERS WITH COUNTING

Meaningful counting activities are very effective in multilingual classrooms because they include visual and hands-on supports. You and families can work together in two ways to reinforce this learning:

- Ask families to teach you counting words like "How many?" in their home language so you can help DLLs make the connection.
- Provide guidance, video examples, counting books, and other materials to families to encourage them to do everyday math in their home language, too.
- When children learn a math concept in one language, they can easily transfer that knowledge to a new one.

Reference

Gelman, R., & C.R. Gallistel. 1978. *The Child's Understanding of Number.* Cambridge, MA: Harvard University Press.

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