

Infants learn to transfer knowledge by 16 months, study finds

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Researchers have identified when an important milestone in infants' development occurs: the ability to transfer knowledge to new situations.

In a series of studies, the researchers found that 8-month-olds had trouble using newly acquired knowledge in a different circumstance, but 16-month-olds could do so.

"Some time between 8 and 16 months, [infants](#) begin learning how to learn," said Julie Hupp, lead author of the study and assistant professor of psychology at Ohio State University's Newark campus.

"They begin to transfer their new knowledge and use it in a totally different situation, which is a very important step in development."

While many scientists had assumed that the ability to transfer knowledge was a product of infant development, no research had tested when that might occur, except for the case of word learning, Hupp said.

Hupp conducted the study with Vladimir Sloutsky, professor of psychology and human development and the director of the Center for [Cognitive Science](#) at Ohio State.

Their work appears online in the *Journal of Experimental Child Psychology* and will be published in a future print edition.

How do scientists test infants' learning ability before children can follow

instructions or, in some cases, even talk? In these experiments, the researchers observed whether the infants learned when to pay attention to images projected on a screen in front of them.

The researchers flashed symbols, such as squares, triangles and musical notes, in a repetitive series on a large screen in front of the children, who were sitting on one of their parent's laps.

Normally, infants will pay attention to the screen at first, when the experience is new, but will rapidly lose interest unless what they see on the screen changes, Hupp said. A video camera underneath the screen recorded the infants' reactions so that the researchers could record when the babies looked away, and if their attention returned when something new was flashed on the screen.

In the first experiment, the researchers wanted to see if infants were more likely to detect changes in the visual sequence when the changes occurred at the beginning or the end of the sequence.

The researchers flashed the same green symbols over and over again until most [babies](#) were bored and began looking away. They then added a new, orange symbol either at the beginning or the end of the sequence.

They found that infants – both 8 and 16 month olds – had a preference for the beginning of the sequence, meaning that they were more likely to notice – and pay attention to the screen - when a symbol was added to the beginning rather than at the end.

After learning that children preferred the beginning of the sequence, the researchers tried to see if they could train them to pay attention to the end of the sequence.

So in a different experiment with new children, the researchers showed a

series of symbols on the screen – but the last symbol in the sequence did something exciting to arouse their interest, such as jumping on the screen or sliding back and forth.

After training the infants to notice the end of the sequence, they showed a new object sequence over and over again with no changes. Finally, they tested the infants by adding a symbol to the beginning or the end of the sequence.

"We found that both the 8 and 16 month olds shifted their attention to the end of the sequence," Hupp said.

"They paid more attention to the end and less to the beginning, suggesting that they learned when in the sequence they should be alert for changes."

But what would happen if these young infants had to transfer that knowledge to a completely different type of situation? The researchers tested that question by training infants to pay attention to the end of a visual sequence – and then seeing if they could transfer that knowledge to an audio sequence.

In the first of two experiments, the infants were shown a video that featured a red circle that flashed while they heard a two-syllable "pseudo-word" (in this case "Ki-Tu"). That sequence was repeated over and over again. Then, they added a syllable either to the end or the beginning of the sequence. This experiment showed that the infants did not seem to have a preference to whether the new syllables were presented at the beginning or end of the sequence – they paid attention to both equally.

So in the final experiment, similar to the earlier sessions, the infants were trained to pay attention to the end of a visual sequence.

But after this training, they were then presented with an auditory sequence with additional syllables added to the beginning or the end.

If the infants had learned from the visual sequence they had just been shown, they should have paid more attention to the end of the auditory sequence, expecting that would be when any changes would occur.

And the 16-month-olds did exactly that – they paid more attention to the end of the auditory sequences. However, the 8-month-olds did not.

"The 16-month-olds took what they learned from the visual sequence and applied it to the auditory sequence. They transferred their knowledge," Hupp said.

"But the 8-month-olds couldn't do that yet."

Provided by The Ohio State University

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