

# Coming up with explanations helps children develop cause-and-effect thinking skills

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Image: Wikimedia Commons

(Medical Xpress)—Asking children to come up with explanations—even to themselves—enhances their cause-and-effect learning abilities, according to new psychology research from The University of Texas at Austin.

The study, published in the *Journal of Experimental Child Psychology*, shows that young children who come up with explanations while [learning](#) are able to connect new ideas with prior cause-and-effect knowledge. By forming their own generalizations, learners can more efficiently understand novel information, says Cristine Legare, associate professor of psychology and lead author of the study.

To examine the potential benefits of [explanation](#)-based learning, Legare

and her collaborator, Tania Lombrozo of the University of California at Berkeley, presented 182 preschoolers (ages 3 to 6) with a mechanical toy composed of colorful, interlocking gears with a crank on one end and a propeller on the other. After showing the children the basics of the toy's moving parts, the researchers separated the children into two groups and asked them to either explain or observe the toy. To assess the learning effects of explanatory versus descriptive responses, the researchers prompted the children with more questions about the toy's appearance and structure.

According to the results of both studies, the explainers across all age groups outperformed other children in understanding the cause-and-effect operations of the toy. They were also better at rebuilding the toy and transferring that new knowledge to other learning tasks. However, explaining does not improve—and can even impair—memory for details, such as the toy's size, shapes and colors.

So why do explainers do so well in understanding the toy's functionality, but falter when it comes to memorizing specific details? One possibility, Legare says, is that explanation helps the learner focus more on understanding cause-and-effect mechanisms, but not so much on the perceptual details.

Although much is still unknown about the role of explanation in early childhood learning, it's clear that explaining engages young learners in ways that other cognitive processes do not.

"Understanding the ways in which explanation does—and does not—improve learning speaks not only to questions about the development of cause-and-effect knowledge, but also to questions about how to most effectively harness explanation for use in educational interventions," Legare says.

In [another paper](#), published in *Child Development Perspectives*, Legare examines the learning benefits of explanation and exploration, two cognitive processes that work in tandem to comprehend novel information. When teachers and parents ask children to explain "why" and "how," they give them an opportunity to think like scientists, Legare says. This approach is effective in and outside the classroom, she notes.

"The way [children](#) gather evidence through exploration and understand it through explanation provides insights into the development of [scientific reasoning](#)," Legare says. "This strategy can help [young children](#) harness their potential for scientific reasoning and improve their critical thinking skills," Legare says.

**More information:** The study is available online:  
[www.concepts.dreamhosters.com/ ... -Early-Childhood.pdf](http://www.concepts.dreamhosters.com/...-Early-Childhood.pdf)

Provided by University of Texas at Austin

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