

Children can tell when adults are not telling the whole truth

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Laura Schulz, a primary investigator in the Early Childhood Cognition Lab in the Department of Brain and Cognitive Sciences at MIT. Credit: M. Scott Brauer

Children learn a great deal about the world from their own exploration, but they also rely on what adults tell them. Studies have shown that children can figure out when someone is lying to them, but cognitive scientists from MIT recently tackled a subtler question: Can children tell when adults are telling them the truth, but not the whole truth?

Led by Laura Schulz, the Class of 1943 Career Development Associate Professor of Cognitive Science, the researchers found that not only can [children](#) make this distinction, but they can also compensate for incomplete information by exploring more on their own.

Determining whom to trust is an important skill to learn at an early age because so much of our knowledge about the world comes from other people, says Hyowon Gweon, an MIT postdoc and lead author of a paper describing the findings in the journal *Cognition*.

"When someone provides us information, we not

only learn about what is being taught; we also learn something about that person. If the information is accurate and complete, then you might also trust that person in the future," Gweon says. "But if this person has taught you something wrong, has made a mistake, or has omitted something that's important for you to know, then you might want to suspend your trust, be skeptical of the information he provides in the future, and even seek other sources of information."

The study builds on a 2011 paper in which Schulz, Gweon, and others investigated how children behave when a teacher explains only one function of a toy that can do four different things. They found that these children spent most of their time exploring only the function the teacher had demonstrated (the toy squeaks when a yellow tube is pulled), assuming that was the only thing it could do. However, children who received no instruction spent more time exploring all of the toy's features and ended up discovering more of them.

Trustworthy or not?

In the new study, Gweon wanted to investigate what the children thought of the teacher who did not fully explain what the toy could do.

"Previous studies about children's trust in informants or teachers focused on whether children distinguish, and learn differentially from, someone who says something false from someone who's telling the [truth](#)," she says. "Going beyond those sensitivities to truth and falseness, what I wanted to see in this study is whether children are also sensitive to someone who's telling the truth but not the whole truth; someone who didn't tell them everything that they ought to know."

In the first experiment, children aged 6 and 7 were given a toy to explore on their own until they discovered all of its functions. One group of children received a toy that had four buttons, each

of which activated a different feature—a windup mechanism, LED lights, a spinning globe, and music—while the other group was given a toy that looked nearly identical but had only one button, which controlled the windup mechanism. Then the children watched as a "teacher" puppet demonstrated the toy to a "student" puppet. For both toys, the teacher's instruction was the same: He demonstrated only the windup mechanism.

After the demonstration, the children were asked to rate how helpful the teacher was, using a scale from 1 to 20. Even though the teacher always demonstrated just the windup mechanism, children who knew the toy had three more undemonstrated functions gave much lower ratings than children who knew it was the toy's only function.

The second experiment began the same way, with the children exploring the toy, then seeing either a full or incomplete demonstration of its functions. However, in this study, the teacher then brought out a second toy. Although this toy had four functions, the teacher demonstrated only one.

Children who had previously seen a demonstration they knew to be incomplete explored the toy much more thoroughly than children who had seen a complete demonstration, suggesting that they did not trust the teacher to be fully informative.

"This shows that children are not just sensitive to who's right or wrong," Gweon says. "Children can also evaluate others based on who's providing information that is enough or not enough for accurate inference. They can also adjust how they learn from a teacher in the future, depending on whether the teacher has previously committed a sin of omission or not."

"The study shows yet another set of criteria that children bring to their evaluation of other speakers, beyond things like accuracy, confidence, or knowledgeability," says Melissa Koenig, an associate professor at the University of Minnesota Institute of Childhood Development who was not part of the research team.

Koenig adds that the study raises several interesting follow-up questions, including when the

ability to make this type of evaluation develops and whether children can distinguish between different factors that might lead a teacher to provide incomplete information, such as the [teacher's](#) lack of knowledge, a willful intention to mislead, or some other circumstance.

Too much information

In another recent study, Gweon and Schulz investigated the flip side of this issue: how children react to teachers who present too much information, rather than too little. In a paper to be presented at the annual conference of the *Cognitive Science Society* in July, they found that children prefer teachers who do not spend time offering information that the children already know, or that they could have inferred from what they already know.

"These studies are the first steps toward understanding just how rich children's understanding of the world is," Gweon says. "Children are trying to bring together all kinds of information in order to make rational decisions about how to learn about the world, and who to go to for more [information](#), while being also mindful of the cost related to learning, such as time and effort."

More information: Hyowon Gweon, Hannah Pelton, Jaclyn A. Konopka, Laura E. Schulz, "Sins of omission: Children selectively explore when teachers are under-informative," *Cognition*, Volume 132, Issue 3, September 2014, Pages 335-341, ISSN 0010-0277, [dx.doi.org/10.1016/j.cognition.2014.04.013](https://doi.org/10.1016/j.cognition.2014.04.013).

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