Psychological reasoning begins earlier than had been thought, study shows

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According to conventional wisdom, babies don't begin to develop sophisticated psychological reasoning about people until they are about 4 years old. A study of 15-month-olds at the University of Illinois at Urbana-Champaign proves otherwise.
The findings, published in the April 8 issue of the journal Science, potentially could lead to an early screening tool for autism, a developmental disability that is marked by a failure on false-belief and related tasks, the researchers say.

In a non-verbal experiment, each participating baby, 56 in all, sat on a parent's lap and faced an actor (a university student). On the table between the baby and the actor was a toy watermelon slice and two boxes whose openings faced each other; one box was green, the other yellow.

To start, the actor picked up the watermelon slice, played with it, and then hid it in the green box. On subsequent trials, the actor always reached into the green box, as though to grasp the watermelon slice she had hidden there.

Then, seemingly unbeknownst to the actor but in sight of the infant, the watermelon slice moved to the yellow box.

This change created a false belief for the actor as to the location of the coveted watermelon slice, said principal investigator Renée Baillargeon (pronounced BY-uhr-zhan), a professor of psychology at Illinois.

The infants expected the actor to search for the watermelon toy in the green box (where she falsely believed it to be), and not in the yellow box (where it actually was and where the infants knew it to be). The infants looked reliably longer when the actor searched the yellow box, as though surprised by this unexpected event.

If the actor was present when the watermelon slice moved from the green to the yellow box, the infants now expected the actor to search the yellow box, and they were surprised if she went to the green box instead. The infants attributed to the actor a true belief that the toy was hidden in the yellow box, and they expected her to act accordingly.

In another condition, the actor was again present when the toy moved from the green to the yellow box – but after she left, the toy returned to the green box. In this condition, the infants attributed to the actor a false belief that the toy was hidden in the yellow box; they expected her to go to that box, and they were surprised when she went to the green box instead.

“Infants understood that the actor could have a true or a false belief about the toy’s location, and they always expected her to act in a manner consistent with her belief, “ Baillargeon said.

Whenever the actor looked for the toy where it was instead of where she falsely believed it to be, the babies looked longer. “Looking-time is the gauge,” Baillargeon said. “This is the violation-of-expectation method: Babies look longer at events they view as unexpected. It is a ‘whoa’ look – a state of heightened attention. It’s like it is in everyday life. You expect something and then when it’s not what it should be, you tend to look longer, as when we watch a magic show. It’s the wow of the unexpected.”

The research, which was part of the doctoral research of lead author

Kristine H. Onishi, now on the psychology faculty at McGill University in Quebec, Canada, has since been duplicated many times using various scenarios in Baillargeon's lab.

"These findings will provide parents and educators with a better understanding of how children think," Onishi said in a McGill news release. "Kids are actively trying to make sense of the things they see others do. To some degree, children think about what others can see, what others think, and what others believe."

The findings also call into question the long-held view that an enormous conceptual change takes place in early childhood in the understanding of others, Baillargeon said.

"If 15-month-olds can reason about what others believe, it means that psychological reasoning is much more sophisticated than we thought, and begins at a much earlier age than we had thought."

Many years of earlier work, reviewed by Onishi and Baillargeon, have suggested that "between 3 and 4 years of age, children go from a non-representational to a representational theory of mind: They begin to understand that beliefs are only representations of reality, which can be true or false," Baillargeon said.

Because their non-verbal approach produced findings that challenge previous assumptions, Baillargeon said, it may be that the verbal tasks used in earlier work were overly complex. It could be that having to predict the actor's actions and also interpret and produce sentences overwhelmed the 3-year-old subjects, she said.

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Source: University of Illinois at Urbana-Champaign