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# Study: Infants can use language to learn about people's intentions

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Infants are able to detect how speech communicates unobservable intentions, researchers at New York University and McGill University have found in a study that sheds new light on how early in life we can rely on language to acquire knowledge about matters that go beyond first-hand experiences.

Their findings appear in the Proceedings of the National Academy of Sciences (*PNAS*).

"Much of what we know about the world does not come from our own experiences, so we have to obtain this information indirectly—from books, the news media, and conversation," explained Athena Vouloumanos, an assistant professor at NYU and one of the study's co-authors. "Our results show infants can acquire knowledge in much the same way—through language, or, specifically, spoken descriptions of phenomena they haven't – or that can't be – directly observed."

The study's other co-authors were Kristine Onishi, an associate professor in the Department of Psychology at Canada's McGill University, and Amanda Pogue, a former research assistant at NYU who is now a graduate student at the University of Waterloo.

Previous scholarship has established that infants seem to understand that speech can be used to categorize and communicate about observable entities such as objects and people. But no study has directly examined whether infants recognize that speech can communicate about

unobservable aspects.

In the PNAS study, the researchers sought to determine if one-year-old infants could recognize that speech can communicate about one unobservable phenomenon that is crucial for understanding social interactions: a person's intentions.

To explore this question, the researchers had adults act out short scenarios for the infants. Some scenes ended predictably (that is, with an ending that is congruent with our understanding of the world) while others ended unpredictably (that is, incongruently).

The researchers employed a commonly used method to measure infants' detection of incongruent scenes: looking longer at an incongruent scene.

Infants saw an adult actor (the communicator) attempt, but fail, to stack a ring on a funnel because the funnel was just out of reach. Previous research showed that infants would interpret the actor's failed behavior as signaling the actor's underlying intention to stack the ring. The experimenters then introduced a second actor (the recipient) who was able to reach all the objects. In the key test scene, the communicator turned to the recipient and uttered either a novel word unknown to infants ("koba") or coughed.

Although infants always knew the communicator's intention (through observing her prior failed stacking attempts), the recipient only sometimes had the requisite information to accomplish the communicator's intended action–specifically, when the communicator vocalized appropriately using speech, but not when she coughed.

If infants understood that speech—but not non-speech—could transfer information about an intention, when the communicator used speech and the recipient responded by stacking the ring on the funnel, infants should

treat this as a congruent outcome. Results confirmed this prediction. The infants looked longer when the recipient performed a different action, such as imitating the communicators' prior failed movements or stacking the ring somewhere other than on the funnel, suggesting they treated these as incongruent, or surprising, outcomes.

Because coughing doesn't communicate intentions, infants looked equally no matter what the recipient's response was.

"As adults, when we hear people speaking, we have the intuition that they're providing information to one another, even when we don't understand the language being spoken. And it's the same for infants," Onishi said. "Even when they don't understand the meaning of the specific words they hear, they realize that words—like our nonsense word 'koba'—can provide information in a way that coughing cannot."

"What's significant about this is it tells us that infants have access to another channel of communication that we previously didn't know they had," added Vouloumanos. "Understanding that speech can communicate about things that are unobservable gives infants a way to learn about the world beyond what they've experienced. Infants can use this tool to gain insight into other people, helping them develop into capable social beings."

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