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How young children communicate could reveal fundamental truths about the nature of conversation

MIT experts in early language development corroborate a long-debated theory about presupposed content in sentences



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MIT researchers have advanced a decades-long theoretical debate in the philosophy of natural language by approaching it from an unconventional angle: the study of language development in children.

In the 1970s, MIT professor emeritus of philosophy Robert Stalnaker modeled the difference between two kinds of content in a sentence — what linguists call “presuppositions” and “assertions” — based on their relation to shared knowledge among conversation participants. Though influential, his theory is difficult to test because its effects are masked by another process at play in complex conversation, known as “presupposition accommodation.”

In a new paper published in *Linguistics and Philosophy*, three researchers in the MIT Department of Linguistics and Philosophy contend that kids are the key to corroborating Stalnaker’s admittance theory (so called in reference to when and how utterances are admitted as conversationally valid). The paper, [“Principles of presupposition in development,”](#) presents new evidence of a developmental stage at which young children distinguish presuppositions from assertions, but have yet to acquire the skills of presupposition accommodation. According to the authors, this stage not only suggests new research directions in child language, but provides ideal conditions for empirically testing admittance theory.

To understand the theory, it’s helpful to imagine two people, Alice and Ben, in conversation. Alice announces, “I’ve stopped using Twitter!” She aims to assert new information about her social media activity. But her choice of the word “stopped” indicates a second kind of information, a presupposition, that she used Twitter previously. According to Stalnaker, presupposed content must be part of the conversational “common ground” — information all conversation participants take to be true. Alice’s wording is appropriate only if her prior Twitter use is already known to Ben.

In practice, conversation is rarely so straightforward. Even if Ben knows nothing about Alice’s history with Twitter, he can infer what she intends him to understand. She assumes he’ll update his background knowledge on the fly, and the interaction can proceed smoothly. Such post-hoc adjustment of common ground is called accommodation, and it’s one of the ways communication works fluidly in real life.

The field of linguistics continues to wrestle with the question: If presuppositions aren’t always *presupposed*, how can we demonstrate that there is a formal requirement that they characterize only established information? Accommodation explains how admittance theory could hold true despite ample evidence to the contrary: speakers take shortcuts, and listeners have ways of dealing with that. But Stalnaker himself acknowledged, in later writings on the topic, the need to respond to “a widely expressed worry that appeal to accommodation is a methodologically suspect way of avoiding counterexamples.”

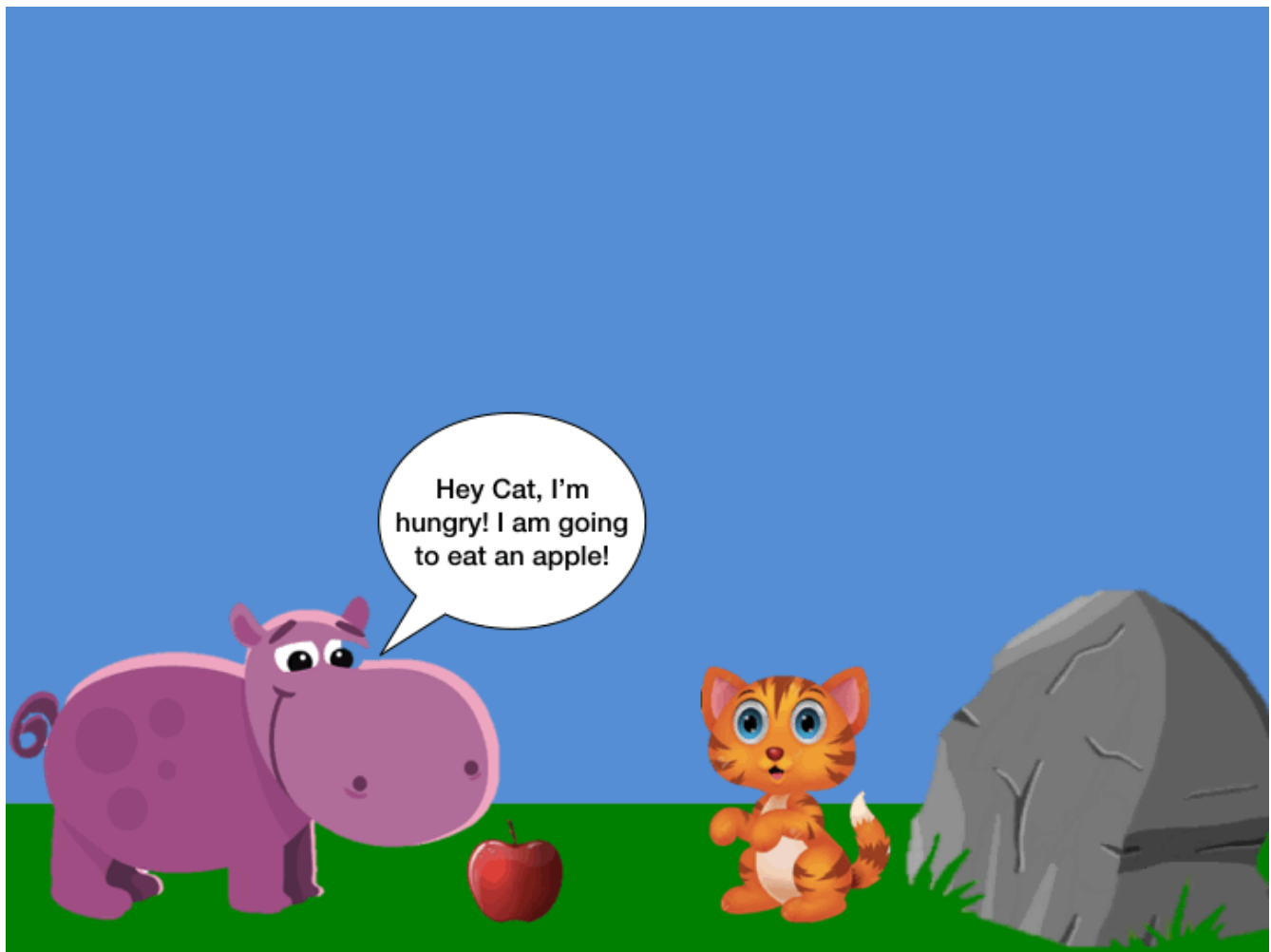
“Human communication is often so complex and multifaceted that Stalnaker’s model initially seems too simplistic to be taken seriously,” says the new paper’s lead author, MIT assistant professor of linguistics Athulya Aravind. “What is striking in our study is that young children behave as if they assume that conversation works in line with the simple model.”

A striking pattern

The paper originated with research Aravind conducted on the way to earning her PhD in linguistics from MIT in 2018. The paper’s co-authors were her dissertation advisors: associate professor of linguistics Martin Hackl, and department head Danny Fox, the Anshen-Chomsky Professor of Language and Thought. Aravind and Hackl co-direct the MIT Language Acquisition Lab, which investigates how young children develop the ability to use and understand language.

The study consisted of three behavioral experiments. In the first two, the researchers found that children ranging from four to six years old expect presuppositions to reflect the current common ground, while assertions broaden common ground. A third experiment showed that children hold to this expectation even in situations when adults use accommodation to skirt those strict requirements.

Aravind says the experimental design called for innovative thinking. “You can’t just ask people what they think about a sentence presupposition, because by virtue of asking, you foreground what is, by nature, backgrounded information,” she notes. To surmount this difficulty, she and her colleagues created a novel paradigm called the Listener Identification Task: The children took part in games in which they helped an experimenter identify which of two hidden characters in a scene is the intended addressee. For example, they viewed a series of pictures accompanied by a story about Hippo and his friends Cat and Fox. Hippo always knows which friend he is talking to, but the child must rely on clues from the interaction to figure that out.



In one example of the Listener Identification Task, children must identify whether the phrasing of Hippo's sentence suggests he is speaking to Cat, who saw him eat an apple, or Fox, who did not. (Courtesy of the researchers)

The first two experiments hinged on the idea that if children recognized when Hippo is using presuppositional triggers — words like “too” and “the” — to imply shared background information, they would likely guess he is speaking to the character aware of that information. As a group, children participating in the experiments acted according to that expectation; so did adults engaged in an equivalent but age-appropriate version of the task.

The behavior of children and adults diverged, however, in a third experiment designed to test mastery of accommodation. Subjects faced situations in which a speaker was *either* asserting content to a listener they knew was already aware of it (for example, declaring “I got a bird today” to a friend who’d accompanied them on that errand) *or* addressing presuppositional content to a listener ignorant of that content (telling a friend unaware of their new pet that “the bird that I got flew away”). When pressed to believe either that a speaker would share redundant information or that they might refer to background knowledge their listener lacks, adults predominantly selected the latter situation. By contrast, children — the youngest subjects in particular — prefer the former.

Young children’s behavior in the situations created for experiment three, write the authors, “suggests a lack of full understanding of how a cooperative listener might deal with an ‘informative’ presupposition. And since these kinds of situations arguably create the strongest possible incentive for deploying accommodation, it is plausible to conjecture that they have not mastered this mode at all.”

Seen in this light, children’s pattern of insisting that presuppositions must be entailed by common ground has remarkable implications. If children yet to master accommodation behave in accordance with a simple theory — rather than with the messy data they encounter in adult communication — then perhaps, Aravind says, “under all the surface complexity, Stalnaker’s theory captures what is at the core of how humans converse.”

Promising terrain for future research

"This work is a brilliant illustration of how powerful it is to put child language study together with fine theoretical work on a sophisticated topic," says Emmanuel Chemla, a cognitive scientist at the French National Centre for Scientific Research, who was not involved in the study. "It provides a cleaner test of the presupposed status of presuppositions and better describes the path humans follow from zero language to adult competence," he says, "and one can also imagine practical consequences: A better understanding of the interpretive differences between adults and young children can help to avoid misunderstandings."

"Our findings provide a crucial starting point for any investigation of child language phenomena connected to presupposition, which is a domain of inquiry that the field has barely begun to work in," says Hackl.

By tying its findings to the longstanding admittance theory debate, the paper also makes a case for the interdisciplinary relevance of investigations like those done by Aravind and Hackl's lab. "Child language in general has not been seen as a potential source of evidence for a large range of linguistic and philosophical theories," says Hackl, "because it is generated by an immature, still developing linguistic system. Our paper shows that this prejudice is sometimes entirely misplaced. A person using an immature system to communicate must rely more on the fundamental mechanisms the system is built from and less on routines that can cover up the internal workings of the system. Thus, child language may reveal to us more about those internal workings than adult language."

The value of idealization

To non-linguists, the enduring dispute over admittance theory might be perplexing. If Stalnaker's model can't predict conversational behavior once a person has mastered the art of accommodation, why does it matter?

Co-author Fox is an expert on how language relates to other aspects of human cognition and reasoning. Stalnaker's theory, he says, needn't be evident in daily interactions to improve our understanding of conversation. "The reason for this apparently bizarre state of affairs is that the theory involves idealizations: statements about underlying mechanisms, which if true, will nevertheless appear to be false due to interacting forces that distort the nature of reality."

Fox points out that this is a familiar concept in the scientific world — we know, for example, that friction interferes with our ability to observe the law of inertia. "The value of idealization is the first thing you learn when you study physics in high school. But somehow people are very resistant to this mode of thinking when it comes to the study of mind and language."

This new study, Fox continues, provides evidence that idealized laws do in fact constrain communication. "How can a child learn that admittance theory is right despite the abundance of counter-evidence?" he asks. "A rather profound possibility suggests itself: namely, that the child doesn't learn the underlying mechanisms because there is nothing that needs to be learned. Things are the way they are because they are determined to be so by very basic principles."

Nicole Estvanik Taylor | [Department of Linguistics and Philosophy](#)

Office of the Dean

MIT School of Humanities,
Arts, and Social Sciences
4-250 | 4-240
77 Massachusetts Avenue
Cambridge, MA 02139-4307
617-253-3450 | shass-www@mit.edu

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