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PRESS RELEASE (2025/03/19)

What does "that" mean in "Did you see that?"

Researchers find that children focus more on literal meaning, while adults use a more integrated approach to resolve ambiguity.

Fukuoka, Japan — "Did you see that?"

It is a simple phrase we hear every day, but how do we know what "that" refers to? A new study from Kyushu University, published on February 13, 2025 (JST) in *PLOS One*, reveals that children and adults use different strategies to interpret such verbal uncertainties, offering fresh insights into the development of human language comprehension.

Imagine watching a quiet night sky. When a shooting star streaks across the sky and someone asks, "Did you see that?", we naturally understand they are referring to the shooting star, not the twinkling stars in the background.

"In a shared conversational environment, a shooting star is a striking event that draws attention, making listeners easily associate 'that' with this moment," explains Research Fellow Reiki Kishimoto and Professor Kazuhide Hashiya from Kyushu University's Faculty of Human-Environment Studies.

Our daily conversations are full of ambiguity. Yet, communication usually flows smoothly because listeners can identify key cues from countless possibilities and interpret the speaker's intent. These cues often include attention-grabbing events or things that just happened.

To study how these interpretation skills develop, researchers at Kyushu University conducted psychological experiments with Japanese children (ages 7–10) and adults.

Participants were shown a series of animations featuring nine monsters that appeared one by one from left to right. While eight of the monsters performed the same action—such as playing the guitar—one monster did something different, like eating. After the last monster appeared, participants heard the Japanese phrase "*Ima-no mita?*" (meaning "Did you see that?") and were asked to freely select which event they thought "that" referred to.

The results show that most children and adults select either the last monster or the one that performed differently. This suggests that recency and rarity serve as common cues for resolving ambiguity across age groups. However, children are significantly more likely to select the last monster than adults, taking "that" to mean simply what just happened.

Children and adults also process rarity and recency differently. As the uniquely behaving monster appears later in the sequence, adults gradually increase their likelihood of selecting it. In contrast, children only show a clear preference for the rare event when it was the very last one. For children, rarity is considered separately from recency, whereas for adults, these two factors interact and are integrated.

"Adults perceive temporal distance as a flexible, continuous variable rather than a fixed point in time. They also use multiple cues to figure out the speaker's intent," explains Kishimoto. "We believe such interpretation strategies require more cognitive resources."

The team hopes their findings will have implications for dialogue robot development and contribute to better support systems for individuals with communication difficulties, including some autistic children.

"Understanding ambiguous references often requires going beyond the literal meaning to grasp context, which can be challenging for some children with autistic traits," Kishimoto

adds. "By uncovering these interpretation mechanisms, we can improve clinical interventions, help children develop communication skills, and form stronger social connections."

Looking ahead, the team plans to explore how interpretation patterns vary across cultures and languages, and how other sensory cues, like sound, can influence the interpretation of ambiguous information.

"Communication has been evolving rapidly, with the rise of SNS and other one-to-many communication forms, knowing how people process and focus on information is more important than ever," concludes Kishimoto. "We hope our findings contribute to a deeper understanding of human social interaction in this changing landscape."

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For more information about this research, see "Recency and rarity effects in disambiguating the focus of utterance: A developmental study," Kishimoto Reiki, and Kazuhide Hashiya, *PLOS One*, https://doi.org/10.1371/journal.pone.0317433

About Kyushu University

Founded in 1911, Kyushu University is one of Japan's leading research-oriented institutes of higher education, consistently ranking as one of the top ten Japanese universities in the Times Higher Education World University Rankings and the QS World Rankings. The university is one of the seven national universities in Japan, located in Fukuoka, on the island of Kyushu—the most southwestern of Japan's four main islands with a population and land size slightly larger than Belgium. Kyushu U's multiple campuses—home to around 19,000 students and 8000 faculty and staff—are located around Fukuoka City, a coastal metropolis that is frequently ranked among the world's most livable cities and historically known as Japan's gateway to Asia. Through its VISION 2030, Kyushu U will "drive social change with integrative knowledge." By fusing the spectrum of knowledge, from the humanities and arts to engineering and medical sciences, Kyushu U will strengthen its research in the key areas of decarbonization, medicine and health, and environment and food, to tackle society's most pressing issues.

Fig. 1. Researchers at Kyushu University designed animations to examine how children and adults use recency and rarity to interpret ambiguous information. In the animations, nine monsters appeared one by one from left to right, with one behaving differently. At the end, participants heard "Did you see that?" and were asked to choose the event(s) they thought it meant. (Kyushu University)

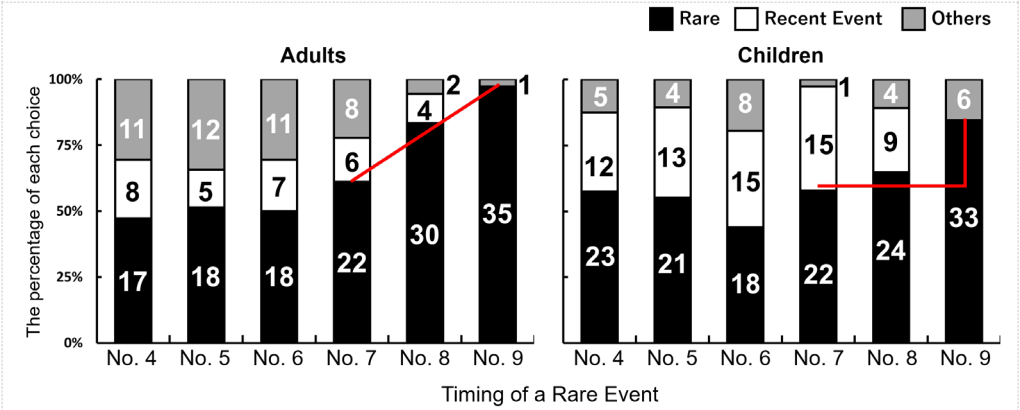

Fig.2 Kyushu University researchers found that when asked “Did you see that?”, adults increasingly chose the rare event as it appeared closer to the question, while children’s preference for the rare event spiked only when it occurred last. (Kyushu University)

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