

# Researchers offer new evidence on four-year-old children's knowledge about ecology

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What do young children from diverse cultural communities think about the natural world? How does a child's existing knowledge and beliefs influence their subsequent learning? Questions like these have remained unanswered, largely because research in this area has focused almost exclusively on urban and suburban children living in majority-culture communities.

New research, the result of a long-standing collaboration among researchers from Northwestern University, the Menominee Indian Tribe of Wisconsin, the American Indian Center of Chicago Education Department and the University of Washington, sheds light on this topic. The study reveals ecological knowledge in 4-year-old children from urban Native American, rural Native American and urban non-Native American communities.

Together, the researchers designed an open-ended task to tap into preschool children's knowledge in all three communities. They created a forest diorama play set, furnished with realistic models of trees, other plants and a pond. Children were introduced to the forest scene, offered a set of realistic toy plants and animals, and simply asked to play. This offered an opportunity to observe how children from each community engineered interactions in the natural world.

"Children's free play in this context revealed many similarities, but also some compelling differences among the communities," said Sandra Waxman, the Louis W. Menk Chair in Psychology in the Weinberg

College of Arts and Sciences at Northwestern and faculty fellow in the University's Institute for Policy Research.

Children from all communities engaged actively with the diorama, talking and playing freely. Importantly, the rural Native American children were especially verbal.

"The rural Native American children, who so often are described as less talkative than their peers, were actually more likely to talk and act out activities with the diorama than children from the other two communities," said Karen Washinawatok, lead author of the study and former chair of the Menominee Indian Tribe of Wisconsin. "This suggests that our free play activity provides an engaging, relevant cultural context for the rural Native American children."

Children from all communities displayed both realistic and imaginary play. And although they had not yet entered the school system, these [preschool children](#) enacted realistic ecological relations among living things.

"Children's inquisitiveness to natural habitats and to ecological relations is relevant to curriculum design for preschool and primary grades," said Megan Bang, associate professor of education at the University of Washington. "Building with children's interests could have important impacts on science education."

However, there were some differences among the communities.

Native American children were more likely than non-Native American children to take the perspective of an animal, either by talking for it (e.g., saying "I'm thirsty!" while making the eagle fly to the pond) or by mimicking the animal's actions (e.g., flapping their own arms like an eagle's wings.) The ability to take the perspective of others is a

developmental accomplishment.

Most research on children's understanding of the [natural world](#) has come from middle-class, European American children living in urban or suburban communities, typically located close to universities. But considerable recent research aimed at broadening this empirical base has revealed that children's knowledge about living things and the relations among them is sculpted by the cultural and environmental contexts in which they are raised. This current research broadens the empirical base by effectively engaging rural and Native American children in addition to urban and primarily European American [children](#).

"Evolving the forms of play in early childhood toward realistic ecological play will be an important innovation in early childhood science education," said Jennifer Woodring, co-author of the study and project coordinator at Northwestern.

"Children's Play with a Forest Diorama as a Window into Ecological Cognition" recently was published in the *Journal of Cognition and Development*.

Provided by Northwestern University

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