

Clever cockatoos learn through social interaction

July 22 2021



A sulphur-crested cockatoo opening the lid of a household waste bin. Credit: Barbara Klump / Max Planck Institute of Animal Behavior

For the first time, a team of international scientists have proven that cockatoos, an iconic Australian bird species, learn from each other a unique skill—lifting garbage bin lids to gather food. The world-first research published today in *Science*, confirms that cockatoos spread this novel behavior through social learning. Led by Barbara Klump and Lucy Aplin (Max Planck Institute of Animal Behavior), along with John Martin (Taronga Conservation Society) and Richard Major (Australian Museum), the team have shown that this behavior by cockatoos is actually learned, rather than a result of genetics.

Lead co-author, Barbara Klump, said social learning is the basis of different regional cultures, and some animals, such as primates and birds, appear to learn socially. "Children are masters of social learning. From an early age, they copy skills from other children and adults. However, compared to humans, there are few known examples of animals learning from each other," Klump said.

"Demonstrating that food scavenging [behavior](#) is not due to genetics is a challenge," Klump added.

However, a few years ago, Richard Major shared a video with senior author Lucy Aplin, showing a sulfur-crested cockatoo opening a closed garbage bin. The cockatoo used its beak and foot to lift the heavy lid then shuffled along the side to flip it over, accessing a rich reward of leftover food.

Aplin, who was then researching at Oxford University and has since moved to the Max Planck Institute of Animal Behavior in Germany, and Klump were fascinated by the footage.

"It was so exciting to observe such an ingenious and innovative way to access a food resource, we knew immediately that we had to systematically study this unique foraging behavior," Klump said.

Major, a senior principal research scientist at the Australian Museum Research Institute, has spent more than 20 years studying Australian bird species such as the noisy minor, the infamous 'bin-chicken' ibis and cockatoos.

"Like many Australian birds, sulfur-crested cockatoos are loud and aggressive and often act like a pack of galahs. But they are also incredibly smart, persistent and have adapted brilliantly to living with humans," Major said.

John Martin a research scientist at Taronga Conservation Society, who has worked alongside Major on many urban bird projects, explained how the research was conducted. "Australian garbage bins have a uniform design across the country, and sulfur-crested cockatoos are common across the entire east coast. The first thing we wanted to find out is if cockatoos open bins everywhere."



A sulphur-crested cockatoo opening the lid of a household waste bin using one of many different opening techniques. This bird holds the lid with the bill and its left foot. A second bird is observing it closely. Credit: Barbara Klump / Max Planck Institute of Animal Behavior

"In 2018, we launched an [online survey](#) in various areas across Sydney and Australia with questions such as, "What area are you from, have you seen this behavior before, and if so, when?" The survey ran for two years and helped us determine how the behavior spread to other cockatoos in Sydney. Importantly we'll be continuing this survey in 2021," Martin said.

By the end of 2019, residents from 44 areas had observed the bin-opening behavior, showing that it had spread rapidly and widely. Further analysis of the survey results showed that the behavior reached neighboring districts more quickly than districts further away, indicating that the new behavior wasn't popping up randomly across Sydney.

"These results show the animals really learned the behavior from other cockatoos in their vicinity," Klump said.

The researchers also marked around 500 cockatoos with small paint dots at three selected hot spots to enable the identification of individual birds, allowing the researchers to observe which birds could open bins. It turned out that only around ten percent could do so, most of which were males. The rest waited until the "pioneers" opened the garbage bins to then help themselves.

There was one exception, however: in late 2018, a [cockatoo](#) in northern Sydney reinvented the scavenging technique itself. Birds in neighboring districts then copied the behavior.

"We observed that the birds do not open the garbage bins in the same way, but rather used different opening techniques in different suburbs, suggesting that the behavior is learned by observing others," Klump said.

The scientists interpreted the results as an emergence of regional subcultures.

The scientists hope that their findings will also generate a broader understanding of urban living animals.

"By studying this behavior with the help of local residents, we are uncovering the unique and complex cultures of their neighborhood [birds](#)," Klump said.

More information: B.C. Klump et al., "Innovation and geographic spread of a complex foraging culture in an urban parrot," *Science* (2021). [science.sciencemag.org/cgi/doi ... 1126/science.abe7808](https://science.sciencemag.org/cgi/doi/10.1126/science.abe7808)

Provided by Max Planck Society

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