



Science Watch - Clever Cockatoos

“They learn to use tools in a way that can resemble our own way of learning how to use tools.” - Antonio Osuna-Mascaró

In the past, hubris led us to believe we were the only animals who could use tools. Then in 1960 Jane Goodall watched a chimpanzee fish out termites from a mound using a twig it had stripped of leaves. Once Goodall made her breakthrough discovery, others began studying chimpanzees for examples of tool use, and in 1995 chimps were observed using a set of tools—a combination of two sticks, one short and rigid, the other long and flexible—to break open a termite mound and fish out the termites.

Subsequent observations further deflated our egos. Researchers discovered that chimpanzees can plan ahead, a feat we thought was solely limited to us. They will carry both sticks to a termite mound and leave behind the puncturing tool so that at a later visit they need only bring a new fishing tool, which usually gets damaged during use.

Other animals were observed using tools. For example, sea otters use rocks to open shellfish. Crows, renowned for their intelligence, are able to both fashion and use tools (see 2017, *Clever Crows* and 2008, *Something to Crow About* at <https://www.hras.org/past-sciencewatch-articles>). But the planning ahead part was still reserved for chimps and us.

Now cockatoos, members of another group of smart birds, parrots, join that select group. Goffin’s cockatoos (*Cacatua goffiniana*), not only use a tool set, but also plan ahead, bringing with them the tools they need to accomplish a particular task. Writing in the March 13, 2023 issue of *Current Biology*, a team led by Antonio Osuna-Mascaró and Alice Auersperg, University of Vienna, Vienna, Austria, tested the ability of Goffin’s cockatoos, endemic to Indonesian forests, to use a combination of two tools to retrieve a treat.

The researchers set up three conditions to challenge the birds. First, ten Goffin’s cockatoos with access to two tools, a short, stiff stick with pointy ends and a longer flexible “fishing pole” straw, were presented with a puzzle, a plexiglass “tool-set” box. The front of the box had a round opening that gave access to a cashew nut on a platform leading to a ramp. But behind the hole a clear membrane blocked direct access to the treat (see figure above). Getting it required a bird to first use the stiff stick to pierce the membrane and then the longer, flexible straw to pull it onto the ramp where it slid down to a lower opening for retrieval.* Six birds solved the task, using both tools in the proper sequence. Two succeeded on their first trial, taking barely 30 seconds to solve the puzzle.

Next, the birds were challenged to get the nut from two different puzzle boxes. A tool-set box or a simpler, single-tool box that had no obstructing membrane and required only the flexible fishing pole to get the treat. More often than not the birds were able to choose the right tool(s) for either box.

The third and critical experiment required the birds to carry the tools while climbing a ladder or flying to a puzzle box that was now out of reach. Just like humans leaving the house and deciding what they need for the day, the birds had to decide which tools to bring on their trip. If faced with a single-tool box, they just brought along the fishing pole. But when confronted with the tool-set box, most carried both tools with them. “They were able to recognize that they would need both tools in the near future,” said Dr. Osuna-Mascaro.

For years scientists thought the avian brain was limited in function because it lacks the cerebral cortex grooves found in the mammalian brain that are correlated with greater cognitive ability. A bird’s brain appears simpler because the surface is smooth. But we now know the upper part of the cerebrum is covered in layers of grey and white matter, the “pallium,” which is analogous to our cerebral cortex.

Clearly, birds rival chimpanzees in intelligence and may even surpass them. Dr. Auersperg, says, “Bird brain should actually be a complement.”

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*Watch the video:<https://www.sciencedirect.com/science/article/pii/S096098222300057X#mmc2>