Study shows crows able to infer actions of hidden agent

18 September 2012, by Bob Yirka

Corvus brachyrhynchos or Corvus caurinus. Image: Wikipedia.

(Phys.org)—The more scientists study animals and their intellectual abilities, the more it appears that many of them have heretofore unknown abilities that can match some of our own. One such animal is the New Caledonian crow which has been found to not only make and use tools, but to fashion them depending on which bird "culture" it happens to live in. The unusually big brained bird has also been found to live in nuclear families and some observers have suggested they even have some degree of affection for one another. For these reasons, a team of researchers from several countries got together to study their inferential skills, and as they describe in their paper published in the *Proceedings of the National Academy of Sciences*, they found the birds had an ability that until now was thought limited exclusively to us humans.

To find out if the birds are able to infer that actions taken behind a screen are the result of some known agent; an inferential skill, the team set up an experiment where the birds first used a stick to get at some food in a box; an exercise that has been demonstrated many times before with New Caledonians. Next however, they threw in something new, a blue sheet of plastic that the birds could not see through. The researches put it near the side of the cage that held one bird at a time, near to where the food box sat. They then stationed a person behind the sheet who pushed a stick through a small slit in the plastic, disrupting and upsetting the bird, preventing it from eating. That set the stage.

To find out if the birds could understand that it was a person manipulating the stick, without actually showing them, they let them see a person first walk behind the screen, observe the stick suddenly poking through at them then stop and then the person reemerging from behind the screen. Turns out, they could. They found this out by adding new twists to the test, such as letting them watch a person simply walk behind the screen to see how they'd react, or by not letting them see the person go behind the screen before wiggling the stick. The crows demonstrated they understood what was going on by avoiding the food box if the stick wiggled in any scenario, until they saw the person get out from behind the screen and walk away, indicating that it was safe to proceed. This the researchers say, proves that the birds truly understood that it was a person behind that screen wiggling that stick even though they never actually saw them do it. They had to infer that information, and that is something, the team reports, that has never before been observed in any other animal, besides people.

More information: New Caledonian crows reason about hidden causal agents, *PNAS*, Published online before print September 17, 2012, doi: 10.1073/pnas.1208724109

Abstract

The ability to make inferences about hidden causal mechanisms underpins scientific and religious thought. It also facilitates the understanding of social interactions and the production of

sophisticated tool-using behaviors. However, although animals can reason about the outcomes of accidental interventions, only humans have been shown to make inferences about hidden causal mechanisms. Here, we show that tool-making New Caledonian crows react differently to an observable event when it is caused by a hidden causal agent. Eight crows watched two series of events in which a stick moved. In the first set of events, the crows observed a human enter a hide, a stick move, and the human then leave the hide. In the second, the stick moved without a human entering or exiting the hide. The crows inspected the hide and abandoned probing with a tool for food more often after the second, unexplained series of events. This difference shows that the crows can reason about a hidden causal agent. Comparative studies with the methodology outlined here could aid in elucidating the selective pressures that led to the evolution of this cognitive ability.

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