

Hyenas cooperate, problem-solve better than primates

September 28 2009, By DeLene Beeland



Hyenas. Image: Wikipedia.

(PhysOrg.com) -- Spotted hyenas may not be smarter than chimpanzees, but a new study shows that they outperform the primates on cooperative problem-solving tests.

Captive pairs of spotted hyenas (Crocuta crocuta) that needed to tug two ropes in unison to earn a food reward cooperated successfully and learned the maneuvers quickly with no training. Experienced hyenas even helped inexperienced partners do the trick.

When confronted with a similar task, <u>chimpanzees</u> and other <u>primates</u> often require extensive training and cooperation between individuals may not be easy, said Christine Drea, an evolutionary <u>anthropologist</u> at



Duke University.

Drea's research, published online in the October issue of *Animal Behavior*, shows that social carnivores like spotted hyenas that hunt in packs may be good models for investigating cooperative problem solving and the evolution of <u>social intelligence</u>. She performed these experiments in the mid-1990s but struggled to find a journal that was interested in non-primate social cognition.

"No one wanted anything but primate cognition studies back then," Drea said. "But what this study shows is that spotted hyenas are more adept at these sorts of cooperation and problem-solving studies in the lab than chimps are. There is a natural parallel of working together for food in the laboratory and group hunting in the wild."

Drea and co-author Allisa N. Carter of the Univ. of California at Berkeley, designed a series of food-reward tasks that modeled group hunting strategies in order to single out the <u>cognitive</u> aspects of cooperative problem solving. They selected spotted hyenas to see whether a species' performance in the tests might be linked to their feeding ecology in the wild.

Spotted hyena pairs at the Field Station for the Study of Behavior, Ecology and Reproduction in Berkeley, Calif. were brought into a large pen where they were confronted with a choice between two identical platforms 10 feet above the ground. Two ropes dangled from each platform. When both ropes on a platform were pulled down hard in unison -- a similar action to bringing down large prey -- a trap door opened and spilled bone chips and a sticky meatball. The double-rope design prevented a hyena from solving the task alone, and the choice between two platforms ensured that a pair would not solve either task by chance.



The first experiment sought to determine if three pairs of captive hyenas could solve the task without training. "The first pair walked in to the pen and figured it out in less than two minutes," Drea said. "My jaw literally dropped."

Drea and Carter studied the actions of 13 combinations of hyena pairs and found that they synchronized their timing on the ropes, revealing that the animals understood the ropes must be tugged in unison. They also showed that they understood both ropes had to be on the same platform. After an animal was experienced, the number of times it pulled on a rope without its partner present dropped sharply, indicating the animal understood its partner's role.

"One thing that was different about the captive hyena's behavior was that these problems were solved largely in silence," Drea said. Their nonverbal communication included matching gazes and following one another. "In the wild, they use a vocalization called a whoop when they are hunting together."

In the second and third experiments, Drea found that social factors affected the hyenas' performance in both positive and negative ways. When an audience of extra hyenas was present, experienced animals solved the task faster. But when dominant animals were paired, they performed poorly, even if they had been successful in previous trials with a subordinate partner.

"When the dominant females were paired, they didn't play nicely together," Drea said. "Their aggression toward each other led to a failure to cooperate."

When a nad've animal unfamiliar with the feeding platforms was paired with a dominant, experienced animal, the dominant animals switched social roles and submissively followed the lower-ranking, nad've animal.



Once the nad've animal became experienced, they switched back.

Both the audience and the role-switching trials revealed that spotted hyenas self-adjust their behavior based upon social context.

It was not a big surprise that the animals were strongly inclined to help each other obtain food, said Kay Holekamp, a professor of zoology at Michigan State University who studies the behavioral ecology of spotted hyenas.

"But I did find it somewhat surprising that the hyenas' performance was socially modulated by both party size and pair membership," Holekamp said. "And I found it particularly intriguing that the animals were sensitive to the nad'veté of their potential collaborators."

Researchers have focused on primates for decades with an assumption that higher cognitive functioning in large-brained animals should enable organized teamwork. But Drea's study demonstrates that social carnivores, including dogs, may be very good at cooperative problem solving, even though their brains are comparatively smaller.

"I'm not saying that spotted hyenas are smarter than chimps," Drea said. "I'm saying that these experiments show that they are more hard-wired for social cooperation than chimpanzees."

<u>More information</u>: Cooperative problem solving in a social carnivore, <u>doi:10.1016/j.anbehav.2009.06.030</u>

Source: Duke University (<u>news</u> : <u>web</u>)

Citation: Hyenas cooperate, problem-solve better than primates (2009, September 28) retrieved 7



May 2024 from https://phys.org/news/2009-09-hyenas-cooperate-problem-solve-primates.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.