

Study shows elephants capable of insight

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Elephants in Experimental Conditions. Image: PLoS ONE 6(8): e23251.
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(PhysOrg.com) -- Kandula, a seven year old Asian elephant living in Washington D.C.'s National Zoo, has proven that elephants are as smart as those that spend a lot of time around them have believed. In an experiment carried out by researchers at the zoo, the little elephant figured out all on his own, without resorting to trial and error, how to go get a cube to use as a footstool to help him reach some food that was just out of reach. The research team, led by Preston Foerder of the City University of New York, has published the results of their study on *PLoS*

ONE.

Other animals (besides humans) such as chimpanzees and dolphins have demonstrated in various ways that they are capable of dreaming up solutions to problems in their head and then carrying them out. Called “aha” moments by researchers, such thinking, a form of insight, is one of the hallmarks of higher intelligence. Most people who have ever worked with [elephants](#) will attest to the fact that they are indeed intelligent creatures; though no one (at least in the research community) had ever witnessed an elephant using insight to solve a problem. This has perplexed scientists for several years, and has caused them to study the seeming paradox. It appears now that the team working with Kandula has seen it in action, that previous research had been attacking the problem from the wrong angle.

In the new study, the team did what countless others before had done. They set some fruit up out of reach of the test subject elephants then lay some bamboo sticks about hoping one of them would get it in his or her head to use the stick to knock the fruit down so they could eat it. Every attempt at this failed. The next go round fared much better.

In the second experiment, the team set the fruit up out of reach as before, but this time, tossed a heavy duty cube into the enclosure. At first nothing happened; in fact, it took eight 20 minute sessions before Kandula, suddenly appeared to get an idea after studying the fruit for a few moments. He immediately ambled on over to where the cube lay, then rolled it over to a position just below the fruit, stepped up with his front feet so as to prop himself up, then very easily grabbed the fruit. It may be that Kandual is exceptionally bright however as the neither of the other two elephants came up with the solution to the problem.

The authors note in their posting that now that they have seen an elephant using insight, they themselves have had an “aha” moment of

their own. Expecting elephants to use a stick to help get food, they say, is akin to asking a person with eyeballs in his hands to look at something after handing them something to hold. Elephants use the tip of their trunk to both touch and smell while searching for food; filling it with a prop would essentially blind them in their search. Duh.

More information: Foerder P, Galloway M, Barthel T, Moore DE III, Reiss D (2011) Insightful Problem Solving in an Asian Elephant. PLoS ONE 6(8): e23251. [doi:10.1371/journal.pone.0023251](https://doi.org/10.1371/journal.pone.0023251)

Abstract

The “aha” moment or the sudden arrival of the solution to a problem is a common human experience. Spontaneous problem solving without evident trial and error behavior in humans and other animals has been referred to as insight. Surprisingly, elephants, thought to be highly intelligent, have failed to exhibit insightful problem solving in previous cognitive studies. We tested whether three Asian elephants (*Elephas maximus*) would use sticks or other objects to obtain food items placed out-of-reach and overhead. Without prior trial and error behavior, a 7-year-old male Asian elephant showed spontaneous problem solving by moving a large plastic cube, on which he then stood, to acquire the food. In further testing he showed behavioral flexibility, using this technique to reach other items and retrieving the cube from various locations to use as a tool to acquire food. In the cube's absence, he generalized this tool utilization technique to other objects and, when given smaller objects, stacked them in an attempt to reach the food. The elephant's overall behavior was consistent with the definition of insightful problem solving. Previous failures to demonstrate this ability in elephants may have resulted not from a lack of cognitive ability but from the presentation of tasks requiring trunk-held sticks as potential tools, thereby interfering with the trunk's use as a sensory organ to locate the targeted food.

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