# Monkeys can work out abstract properties of objects by looking at them

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(Phys.org) —Monkeys, much like young children, can work out abstract properties of objects by looking at them, according to the latest research.

In a new study by scientists at the University of St Andrews, it was found that non-human primates share the same basic knowledge as a three-year-old child in their understanding of objects.

The researchers behind the study, of capuchin monkeys, chimpanzees and bonobos, say that the results suggest that there is more to their world than meets the eye.

Dr Amanda Seed, a lecturer at the University's School of Psychology & Neuroscience, said, "We set out to find out how animals conceive the world around them. Do they have any idea that objects have abstract properties, like solidity and weight? Or do they rely on learning arbitrary relationships between what you see, what you do and what you get, in the same way that we learn to stop at a red light?"

The research, which involved a simple task using a piece of string, was a collaboration with scientists in Germany, Spain and Italy.

The team tested different species on two variants of a simple problem: both involved a box containing two pieces of string – one broken and one unbroken - that connected to food. Only pulling the unbroken piece of string resulted in the reward of food.

In one variant, the box was covered, with another pair of strings placed on top, while the other task involved the box being open, with the functionality – of the string connecting to the food – completely visible.

Both versions provided subjects with the same visual task: to avoid the broken white line and choose the unbroken one.

In the coveredversion, since the important part of the problem was covered up, the subjects had to use the visual pattern of the objects without being able to see their functional relevance.

Individuals of all species performed much better in the uncovered condition when the pattern 'made sense' - when they could see the connected line was a string connected to food - than when it was just a

rule to be learned.

Researchers say the study shows that monkeys, apes and young children find it difficult to learn what to do with an object, unless they can see its functionality in action.

Dr Seed said, "We set two tasks with the same outcome, both involved objects that could be seen, but in one the visible object caused the outcome and in the other it didn't; we found that the monkeys and apes were only able to solve when they could see the object's function.

"Our research shows that learning arbitrary patterns is not actually that easy for primates, and even five-year-old children find it hard. In comparison: choosing a connected string in a functional context is easy. This suggests that these species do have object knowledge and that there is more to their world than meets the eye.

The paper "Abstract Knowledge in the Broken-String Problem: Evidence from Nonhuman Primates and Pre-Schoolers" is published by *PLOS One*.

**More information:** Mayer C, Call J, Albiach-Serrano A, Visalberghi E, Sabbatini G, et al. (2014) "Abstract Knowledge in the Broken-String Problem: Evidence from Nonhuman Primates and Pre-Schoolers." *PLoS ONE* 9(10): e108597. DOI: 10.1371/journal.pone.0108597