

Wild capuchin monkeys found able to remember where and when their food was hidden

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Credit: © Charles Janson

(Phys.org)—Charles Janson, a professor of biological anthropology, zoology and evolutionary biology at the University of Montana, has found that capuchin monkeys have memory abilities that are far more

complex than has been realized. In his paper published in *Proceedings of the Royal Society B*, he describes experiments he designed and carried out with monkeys in the wild, what he observed and why he now believes that the monkeys have integrated memories regarding food sites including where they are located, how much food is likely to be at a particular site and an awareness of how much time has passed since they last visited each site.

Janson notes that prior research showed that [capuchin monkeys](#) were able to remember the location and amount of food at patches they had previously visited—in this new effort, he sought to discover if they remembered other things about the places where they get their food. To learn more, he set up eight feeding sites in Iguazu Falls National Park in northeastern Argentina, which allowed him to vary the amount of food the monkeys would find at a given site. He simulated the maturing process that fruit goes through naturally by putting more food at sites that had been there longer and observed the behavior of the monkeys visiting the sites and eating what they found there.

He found that over a period of 68 days, which corresponded to two fruit maturation cycles, a group of monkeys that visited his test patches had to make 212 choices regarding where to eat. He then compared their choice making with simulated movements and against statistical models to provide a means for judging whether the choices were random or were made intentionally by the monkeys. He reports that the choices made by the monkeys indicated they were using dynamic memory to keep track of elapsed time specific to each of the feeding sites. What this meant was that the [monkeys](#) were able to keep track of not only where the [food](#) would be, but how much to expect at each patch based on how much time had passed. And this means that they possess memory skills that up till now, only humans were believed to have.

More information: Charles H. Janson. Capuchins, space, time and

memory: an experimental test of what-where-when memory in wild monkeys, *Proceedings of the Royal Society B: Biological Sciences* (2016).
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Abstract

There is considerable controversy about the existence, extent and adaptive value of integrated multimodal memory in non-human animals. Building on prior results showing that wild capuchin monkeys in Argentina appear to recall both the location and amount of food at patches they had previously visited, I tested whether they also track and use elapsed time as a basis for decisions about which feeding patches to visit. I presented them with an experimental array of eight feeding sites, at each of which food rewards increased with increasing elapsed time since the previous visit, similar to the pattern of ripe fruit accumulation in natural feeding trees. Over the course of 68 days, comprising two distinct renewal rate treatments, one group repeatedly visited sites in the feeding array, generating 212 valid choices between sites. Comparison of observations against simulated movements and multinomial statistical models shows that the monkeys' choices were most consistent with dynamic memory for elapsed time specific to each of the eight sites. Thus, it appears that capuchin monkeys possess and use integrated memories of prior food patch use, including where the patch is relative to their current location, how productive the patch is and how long it has been since they last visited the patch. Natural selection to use such integrated memories in foraging tasks may provide an ecologically relevant basis for the evolution of complex intelligence in primates.

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