



Press Release

Orangutans spontaneously use wooden hammers to crack nuts

University of Tübingen researchers show that orangutans do not need to be taught how to use a hammer

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Using an object to crack nuts is considered one of the most complex tool-using behaviors in the animal kingdom. So far, only chimpanzees, capuchins and macaques have been observed cracking nuts with such tools in the wild. In a new study, Dr. Elisa Bandini and Dr. Claudio Tennie from Early Prehistory and Quaternary Ecology at the University of Tübingen investigated whether other primate species such as orangutans also crack nuts with tools and how the animals can learn to do so. Of twelve orangutans living in zoos, four spontaneously and successfully used the proffered wooden hammers for this purpose even though they were not able to copy the behavior from others. The study is published in the *American Journal of Primatology*.

“Among the great apes, and after chimpanzees, orangutans are the ones known to have the second largest repertoire of tool use. However, wild animals have not previously been observed cracking nuts,” says Claudio Tennie. In the new study, four orangutans at Leipzig Zoo who had not been shown this behavior were given hard nuts, sections of branch to use as hammers, and a block of wood that could serve as an anvil.

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One orangutan initially used the anvil as a hammer. In later experiments the anvil was fixed to the ground, whereupon the animal spontaneously used the wooden hammer to crack the nuts. The other three older orangutans, however, tried using their hands or teeth. “For those three larger animals, biting the nuts got them what they wanted,” Tennie reports.

In their analysis, the researchers included a similar, previously unpublished study from Zürich Zoo with eight orangutans. Of the twelve orangutans tested across both locations, four individuals, one in Leipzig and three in Zurich, spontaneously began cracking nuts with wooden

hammers. “So the orangutans themselves can develop this complex behavior purely through individual learning,” says Elisa Bandini. Nut-cracking with tools is thus – at least in orangutans – a behavior that does not require cultural transmission – it does not require models. “In the research, the opposite assumption had previously been made and it had even been posited that the skill would die out in great apes if it could not be passed on culturally,” she adds.



Padana, a female orangutan at Leipzig Zoo, continued to use wooden hammers to crack nuts for some time after the end of the study. Photo: Claudio Tennie

Publication:

Elisa Bandini, Johannes Grossmann; Martina Funk, Anna Albiach Serrano & Claudio Tennie: Naïve orangutans (*Pongo abelii* & *Pongo pygmaeus*) individually acquire nut-cracking using hammer tools. *American Journal of Primatology*, <https://doi.org/10.1002/ajp.23304>

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