

Chimpanzees successfully play the 'ultimatum game': Confirmation of apes' sense of fairness

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Image: Wikipedia.

Researchers at the Yerkes National Primate Research Center, Emory University, are the first to show chimpanzees possess a sense of fairness that has previously been attributed as uniquely human. Working with colleagues from Georgia State University, the researchers played the Ultimatum Game with the chimpanzees to determine how sensitive the animals are to the reward distribution between two individuals if both

need to agree on the outcome.

The researchers say the findings, available in an early online edition of the [Proceedings of the National Academy of Sciences](#) (*PNAS*) available this week, suggest a long [evolutionary history](#) of the human aversion to inequity as well as a shared preference for fair outcomes by the [common ancestor](#) of humans and apes.

According to first author Darby Proctor, PhD, "We used the [Ultimatum Game](#) because it is the gold standard to determine the human sense of fairness. In the game, one individual needs to propose a reward division to another individual and then have that individual accept the proposition before both can obtain the rewards. Humans typically offer generous portions, such as 50 percent of the reward, to their partners, and that's exactly what we recorded in our study with [chimpanzees](#)."

Co-author Frans de Waal, PhD, adds, "Until our study, the [behavioral economics](#) community assumed the Ultimatum Game could not be played with animals or that animals would choose only the most selfish option while playing. We've concluded that chimpanzees not only get very close to the human [sense of fairness](#), but the animals may actually have exactly the same preferences as our own species." For purposes of direct comparison, the study was also conducted separately with human children.

In the study, researchers tested six adult chimpanzees (*Pan troglodytes*) and 20 human children (ages 2 – 7 years) on a modified Ultimatum Game. One individual chose between two differently colored tokens that, with his or her partner's cooperation, could be exchanged for rewards (small food rewards for chimpanzees and stickers for children). One token offered equal rewards to both players, whereas the other token favored the individual making the choice at the expense of his or her partner. The chooser then needed to hand the token to the partner,

who needed to exchange it with the experimenter for food. This way, both individuals needed to be in agreement.

Both the chimpanzees and the children responded like adult humans typically do. If the partner's cooperation was required, the chimpanzees and children split the rewards equally. However, with a passive partner, who had no chance to reject the offer, chimpanzees and children chose the selfish option.

Chimpanzees, who are highly cooperative in the wild, likely need to be sensitive to reward distributions in order to reap the benefits of cooperation. Thus, this study opens the door for further explorations into the mechanisms behind this human-like behavior.

For eight decades, the Yerkes National Primate Research Center, Emory University, has been dedicated to conducting essential basic science and translational research to advance scientific understanding and to improve the health and well-being of humans and nonhuman primates. Today, the center, as one of only eight National Institutes of Health–funded national primate research centers, provides leadership, training and resources to foster scientific creativity, collaboration and discoveries. Yerkes-based research is grounded in scientific integrity, expert knowledge, respect for colleagues, an open exchange of ideas and compassionate quality animal care.

Within the fields of microbiology and immunology, neurologic diseases, neuropharmacology, behavioral, cognitive and developmental neuroscience, and psychiatric disorders, the center's research programs are seeking ways to: develop vaccines for infectious and noninfectious diseases; treat drug addiction; interpret brain activity through imaging; increase understanding of progressive illnesses such as Alzheimer's and Parkinson's diseases; unlock the secrets of memory; determine how the interaction between genetics and society shape who we are; and advance

knowledge about the evolutionary links between biology and behavior.

More information: "Monkeys are perceptually tuned to facial expressions that exhibit a theta-like speech rhythm," by Asif A. Ghazanfar, Ryan J. Morrill, and Christoph Kayser, *PNAS*, 2013.

Provided by Emory University

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