

Chimpanzees learn rock-paper-scissors

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Credit: Springer

Chimpanzees of all ages and all sexes can learn the simple circular relationship between the three different hand signals used in the well-known game rock-paper-scissors. Even though it might take them longer, they are indeed able to learn the game as well as a young child. Jie Gao of Kyoto University in Japan and Peking University in China is lead author of a study in the journal *Primates*, which is the official journal of the Japan Monkey Centre, and is published by Springer. The research compares the ability of chimpanzees and children to learn the rock-paper-scissors game.

Gao's research team wanted to find out whether chimpanzees (*Pan troglodytes*) can grasp extended patterns. They used the rock-paper-scissors [game](#), a popular [children's](#) game in which the hand signal for "paper" always beats "rock", while "rock" trumps "scissors", and "scissors" defeats "paper". The [relationship](#) between the signals are non-linear and must be understood within the context of how the pairs are grouped. Learning such transverse patterns requires enhanced mental capacity and it is useful when forming complex relationship networks, solving problems, or updating what you already know about a subject.

Seven chimpanzees of different ages and sexes living in the Primate Research Institute at Kyoto University were part of the experiment. They sat in a booth housing a computer-based touchscreen and were trained to choose the stronger of two options (based on the rules of the game) they saw on screen. They first learnt the paper-rock sequence, then the rock-scissors one and finally the scissors-paper combination. Once they knew how the pairs fitted together, all the different pairs were randomly presented to them on screen. Five of the seven chimpanzees completed the training after an average of 307 sessions.

The findings show that chimpanzees can learn the circular pattern at the heart of the game. However, it took them significantly longer to learn the third scissors-paper pair than it did to grasp the others, which indicates that they had difficulty finalizing the circular nature of the pattern.

The research team then also taught the game to 38 preschool children to compare the learning process of chimpanzees with that of humans aged three to six. The children had little difficulty grasping the game, and on average did so within five sessions. Their performance was, however, subject to age. The older the children were, the more accurate they became when all three pairs were randomly presented to them. Participants older than 50 months (about four years) played the game with more skill rather than luck.

"This suggests that children acquire the ability to learn a circular relationship and to solve a transverse patterning problem around the age of four years," says Gao. "The [chimpanzees'](#) performance during the mixed-pair sessions was similar to that of four-year-old children," adds Gao, who hopes the findings will inspire future studies into how age and sex influence the ability of members of various species to learn circular relationships.

More information: Jie Gao et al, Learning the rules of the rock–paper–scissors game:

chimpanzees versus children, *Primates* (2017). DOI:
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