Translated paper: Learning the rules of the rock–paper–scissors game: chimpanzees Versus children

Zhixuan Chen (u830797)
z.chen_1@tilburguniversity.edu
Visual Thinking and Composition
Master Communication and Information Sciences
Business Communication and Digital Media
Faculty of Humanities
Tilburg University, Tilburg

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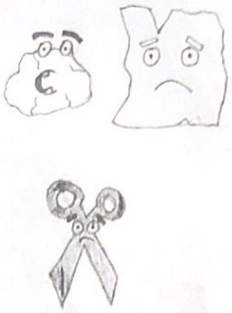
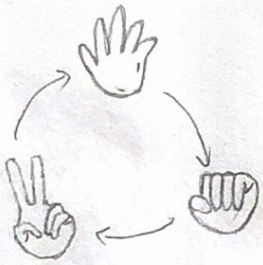
Instructor: Neil Cohn, neilcohn@visuallanguagelab.com,
www.visuallanguagelab.com

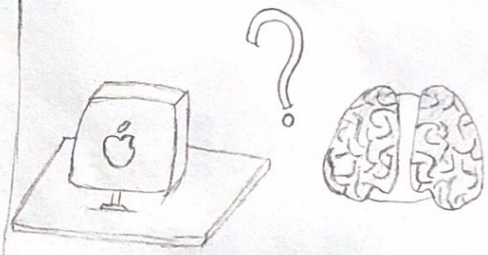
Learning the rules of the rock–paper–scissors game: chimpanzees versus children

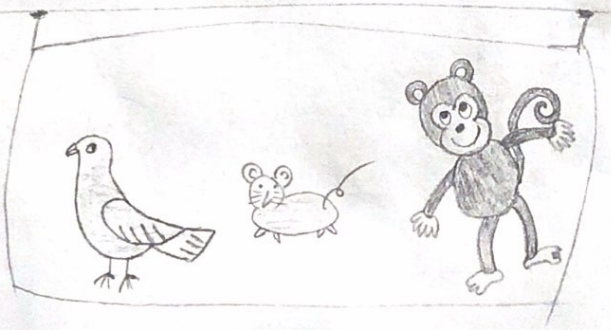


Paper-rock-scissors game is a kind of transverse pattern. Transverse patterning task represents the simplest circular relationship.



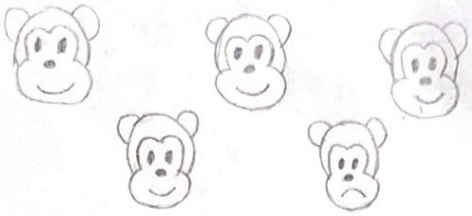
This type of mental process can be used in complex relationship network building, knowledge updating and problem solving.

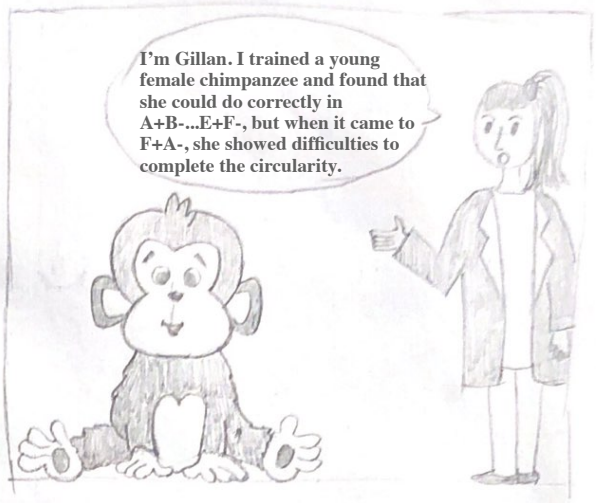




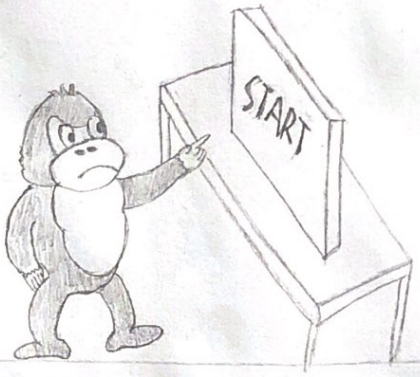
Previous research found that some animals that monkeys, rats, pigeons have the ability to grasp transverse patterning task, while rats and pigeons have difficulties on the third pair than the first and second pairs.

Thompson conducted a study on 5 chimpanzees. Four of them were able to complete transverse patterning task.

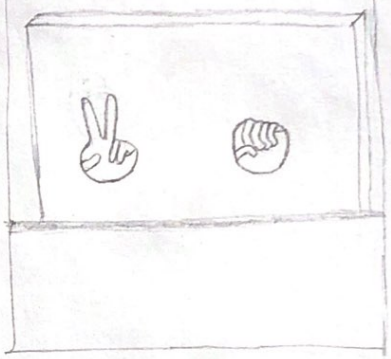




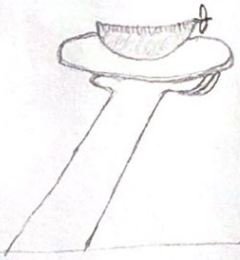
In current study, researchers conducted the experiment in 7 chimpanzees. They were taught by a touch screen. When they click the circle, it would start.



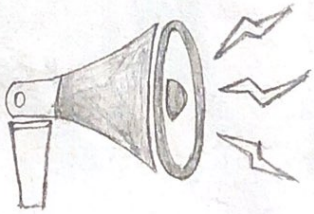
Each time, two gestures appeared on the screen and they need to choose either one.



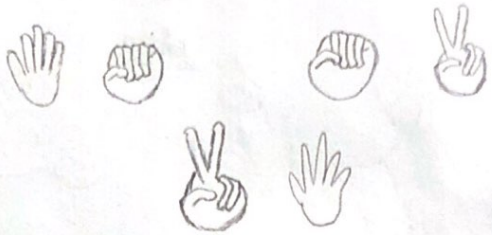
When chimpanzees made right choices, they could get a piece of apple from a feeder.

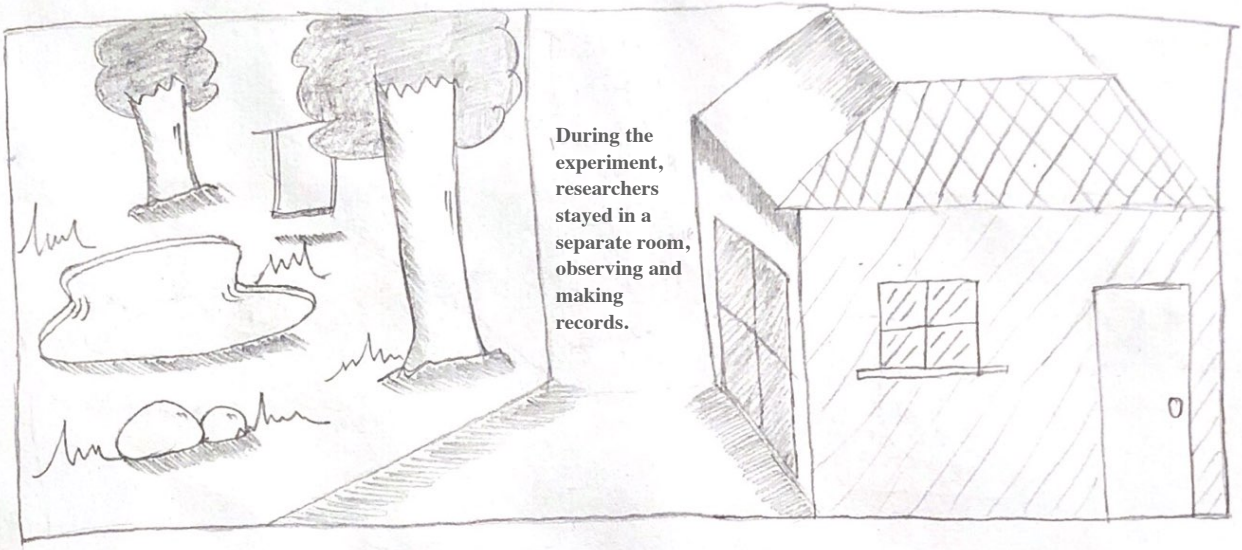


When they did wrongly, an error buzzer sounded and no food provided.

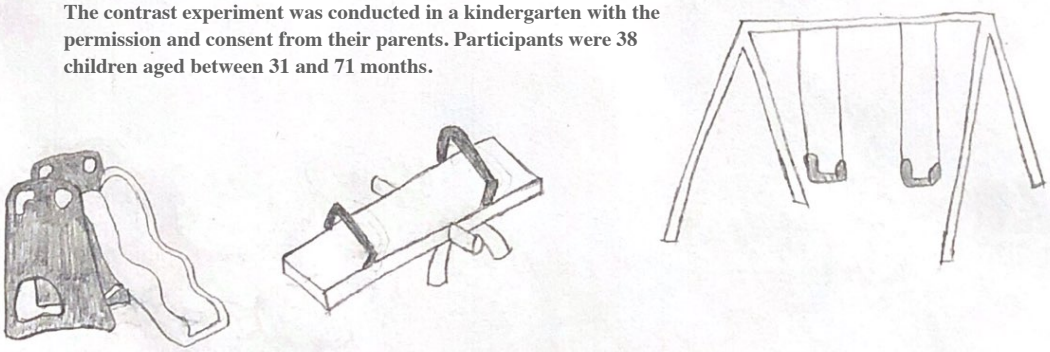


When they reached 90% accuracy in each session, they could participated in mixed-pair session.

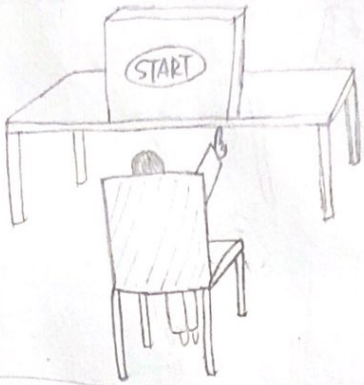




The contrast experiment was conducted in a kindergarten with the permission and consent from their parents. Participants were 38 children aged between 31 and 71 months.

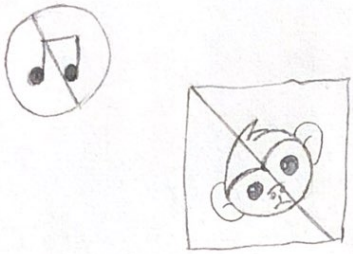


Similar to the chimpanzee experiment, participants performed the task on a touch screen laptop.



When they gave correct answer the laptop would present a chime sound with a positive picture of infant chimpanzees playing.

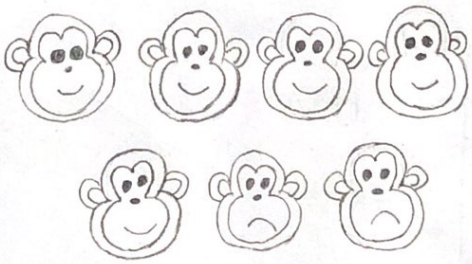
When they chose wrongly, no sound or picture would present.

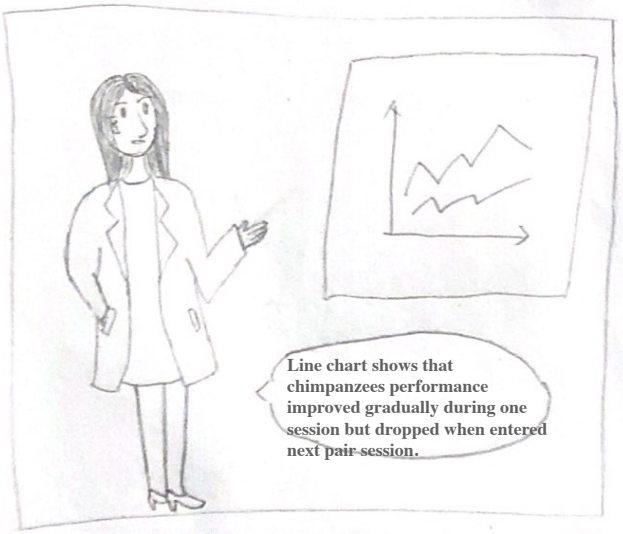


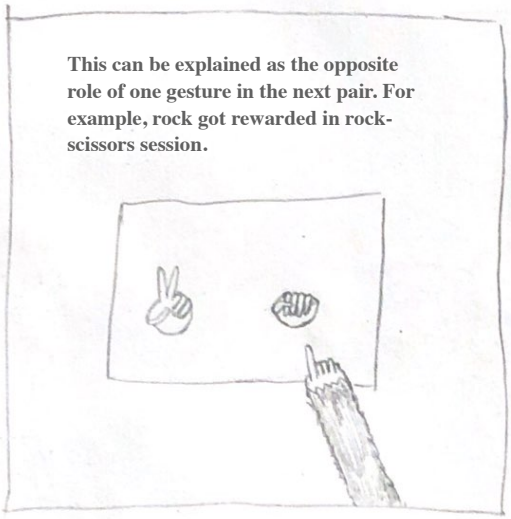
When they made four continuous correct choices, they could turn to next session.

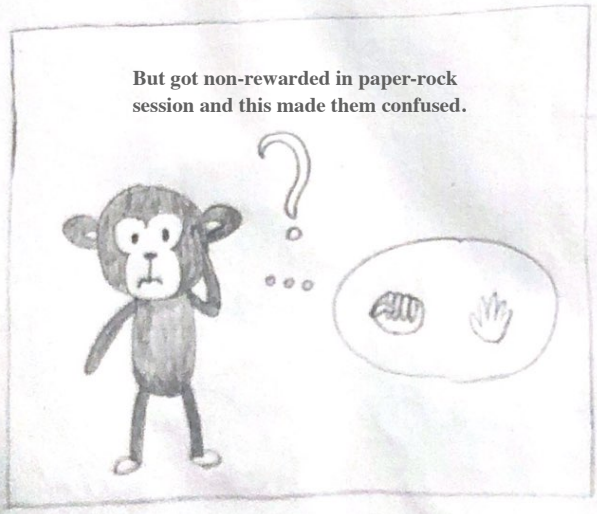
They were given suggestions as 'try again' if they made errors.

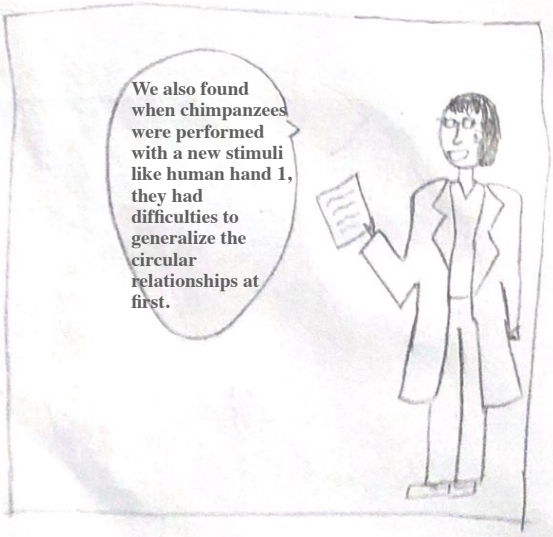
Five of the seven chimpanzees completed the training phase, which showed that chimpanzees had the ability to learn the circular relationship.

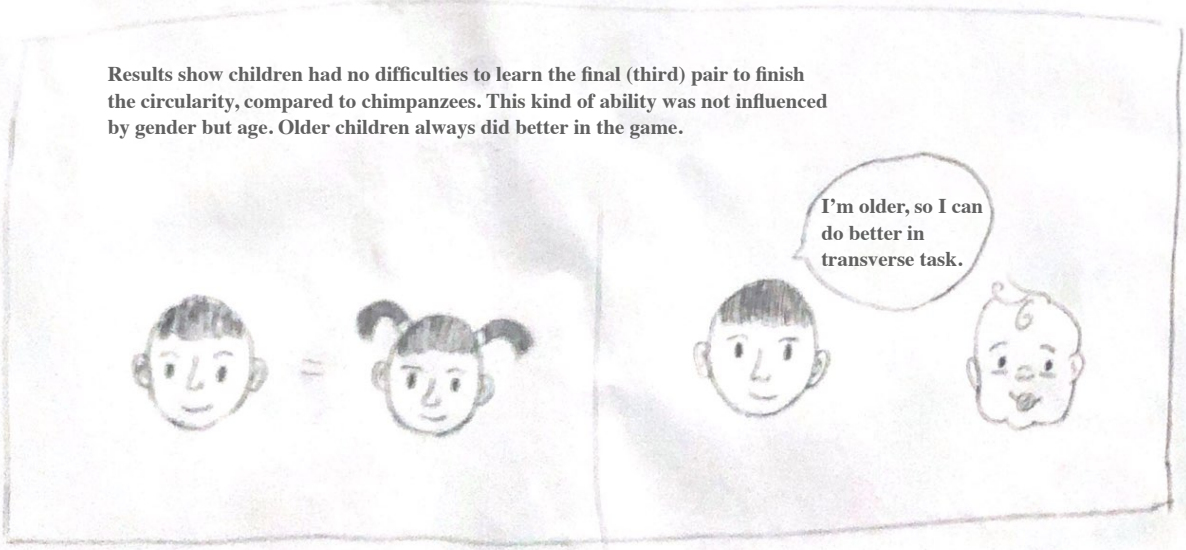



Line chart shows that chimpanzees performance improved gradually during one session but dropped when entered next pair session.

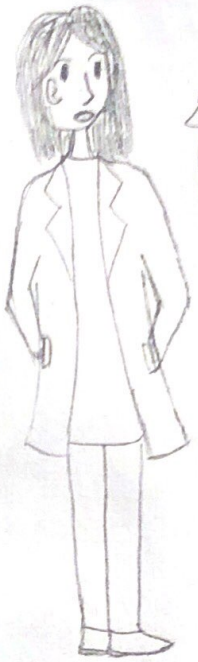

This can be explained as the opposite role of one gesture in the next pair. For example, rock got rewarded in rock-scissors session.


But got non-rewarded in paper-rock session and this made them confused.


We also found when chimpanzees were performed with a new stimuli like human hand 1, they had difficulties to generalize the circular relationships at first.


Results show children had no difficulties to learn the final (third) pair to finish the circularity, compared to chimpanzees. This kind of ability was not influenced by gender but age. Older children always did better in the game.
I'm older, so I can do better in transverse task.

The accuracy of chimpanzees in random sessions was similar to the performances of children that were in approximately 4 years old.



However, there were some limitation in our study. The chimpanzee participates included male and female, young and old adult, so the effect of age and sex was still unclear.

Future study could explore how age and sex influence the ability of various species to learn a circular relationship and figure out the inner reason that chimpanzees and other animals have difficulties in learning circular relationship.