

## CORE STUDY #3: YAMAMOTO 2012 (CHIMPANZEE HELPING)

### Aim:

To investigate helping behavior in chimpanzees:

- To investigate whether chimpanzees can understand the needs of conspecifics.
- To investigate whether chimpanzees can respond to those needs with targeted help.
- **Conspecific - a member of the same species. In this study, 'conspecifics' refers to other chimpanzees.**
- **Targeted helping - targeted helping is considered to be linked to the cognitive capacity for empathy. Among nonhuman animals, only some great ape, cetacean, and elephant species demonstrate this form of helping behavior. By definition, animals are expected to understand others' needs.**

### Background:

Based on the knowledge that humans can display altruistic behaviors, and to see whether animal species, specifically chimpanzees, can do the same. The ability to offer targeted help stems directly from the theory of mind (ToM).

- **Altruism - acting helpfully towards others without obvious benefit to oneself. An example of this might be chasing after a stranger to return their wallet, which involves no guarantee of reward.**
- **Theory of Mind (ToM) - the ability to recognize that others have distinct feelings, beliefs, knowledge, and desires from our own is known as having a theory of mind. Theory of mind is often linked to empathy (the ability to sense other people's emotions, coupled with the ability to imagine what someone else might be thinking or feeling.**

### Method:

#### *Participants*

- 6 chimpanzees (of which 5 were used) were housed socially at the Primate Research Institute at Kyoto University, Japan
- These chimpanzees were put in mother-juvenile pairs:
  - Ai (mother) & Ayumu (juvenile)
  - Pan (mother) & Pal (juvenile)
  - Chloe (mother) & Cleo (juvenile)
- Each chimpanzee had previously been a part of other studies investigating behavior in a similar setting to the current study.

#### *Design*

- Laboratory experiment at the Primate Research Institute at Kyoto University
- Independent variable: the ability of the chimpanzee to give targeted helping in two conditions: the can see and cannot see conditions.
- Repeated measures design
- The dependent variable was operationally defined as the items offered by the participants to conspecifics.
- The entire procedure for each condition and each chimpanzee was recorded on camera and was used to produce quantitative data: the number of correct targeted offers per condition

#### *Procedure*

- The helper chimpanzee had to offer the recipient chimpanzee the correct tool.
- One task required a stick and the other straw.
- The recipient chimpanzee obtained a reward: a juice box.
- There were 7 objects in the helping chimpanzee's tray:
  1. Stick
  2. Straw
  3. Belt
  4. Chain
  5. Brush
  6. Hose
  7. String.
- First, the chimpanzee did condition 1 (can see).
- Next, the chimpanzee did condition 2 (cannot see).
- Then, they repeated condition 1 (can see) to check for order effects.
- There were 48 trials carried out in each condition of a random order of 24 stick and 24 straw use conditions.
- There were 2-4 trials per day.
- A trial started when the tray was presented to the helper chimpanzee.
- The trial ended when the recipient succeeded in obtaining the juice box or when 5 minutes had passed without receiving an object.

## Results:

### *Can see condition*

- Object offer = 90% of trials. In the familiarisation phase, the object offer was 5%.
- 'Upon request offer' accounted for 90% of all offers.
- Except for Pan, sticks, and straws were significantly more frequently offered than the non-tools (78% - 97.4%).
  - Pan most frequently offered the brush, which may be due to experience.
- Chimpanzees were able to offer targeted helping based on their partner's needs
- Cannot see condition
- Object offer = 90% of trials. Upon request offers accounted for 71.7% of all offers.
- Cleo showed a significant increase in offering help in the 'cannot see condition' and this may be due to a carryover effect. This increased voluntary offer as the helper learned that they are expected to offer an object to their partner.
- Stick/straw was not offered more than the non-tools except for Ayumu who kept peeking through the hole. This shows that chimpanzees understood their partner's goals only when they could see.
- Second can see condition
- 3 chimpanzees who had shown a significant decrease in tool selection in the first condition and a non-significant decrease in the cannot see condition were used.
- Object offer observed for 98% of trials. Upon request offers accounted for 79% of all offers.
- Significant decrease in the offer of stick/straw depending on the partner's situation. This confirms that flexible targeted helping with an understanding of the tool needed to complete the task was possible when chimpanzees could see the task for themselves.

## Conclusions:

- Chimpanzees will offer help to conspecifics who require it in the majority of cases, but usually as a response to a direct request rather than as a spontaneous act
- Chimpanzees rely on visual confirmation of conspecific needs to offer targeted helping.

## Evaluation:

**A strength of this study is that it is highly replicable.** This is because it was done in a controlled laboratory environment with standardized procedures at the Primate Research Institute at Kyoto University, Japan. This means that another researcher can simply get another group of mother-juvenile chimpanzees and repeat the procedure. This allows the findings to be tested for accuracy, increasing the validity of the study,

**Another strength of this study is that it is highly reliable.** This is because of the strict standardized procedures that were used, for example using the same 7 tools for all the chimpanzees, repeating the can-see conditions to eliminate order effects, and using a video camera to record data. This increases the reliability of this study.

**A weakness of this study however is that it lacks ecological validity.** This is because it was conducted in a standardized laboratory environment at Kyoto University, which is not a natural environment for chimpanzees to carry out targeted helping and communication. This reduces the validity of this study.

**Another weakness of this study is that it lacks generalisability.** This is because the study only used 6 chimpanzees for this study that were born and bred in captivity and socially housed at Kyoto University. The results can therefore not be generalized to the wider population of chimpanzees in the wild. This reduces the validity of the study.

## Issues and debates:

- **Application to daily life:** the findings of this study may be generalized to children in terms of development and education about helping others. If children and chimpanzees take the same developmental path, we could educate children about helping behaviors.
- **The use of animals:** there were 5 pairings and so the researchers used the minimum amount of animals they could for this study. They were socially housed at Kyoto University, an acceptable choice because of the chimpanzees' social nature. None of the chimpanzees were deprived of any necessary items, and none of them underwent aversive stimuli.