

Comparative Cognitive Science

"We had so many things we wanted to know! By introducing eye tracking, the team can even search for, and identify, "unknown" questions to be addressed in addition to those already known, which will be a great contribution to the research."

Associate Professor Dr. Masaki Tomonaga
Primate Research Institute, Kyoto University

Eye tracking is used as a method in comparative cognitive science to understand the mind of animals other than human beings. The Primate Research Institute at Kyoto University successfully uses Tobii Eye Trackers in research on chimpanzees.

The Primate Research Institute at Kyoto University conducts research to understand the minds of chimpanzees from the standpoint of comparative cognitive science and to clarify aspects of the developmental trajectories of the chimpanzee mind.

The research is quite closely connected with human developmental studies, and the extensive use of Tobii Eye Trackers in infant research was what first caught Dr. Tomonaga's interest in eye tracking.

Dr. Tomonaga and the team had the Tobii eye tracker set up and tested and were surprised and amazed at how well it worked on the chimpanzee. Now they are conducting several studies, which include eye tracking.

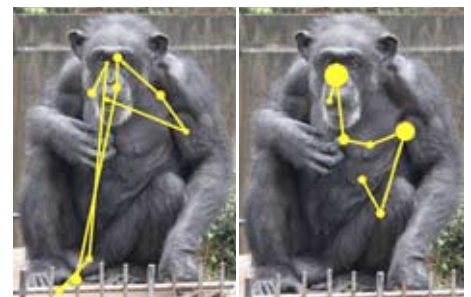


A chimpanzee is being eye tracked at a research station, while performing a task.

Research questions

Questions that the team are interested in researching are, for example; how chimpanzees look at informational areas versus backgrounds, how they scan the faces, torso, legs, genitals, etc. of humans, chimpanzees and other animals, and how they scan faces with different expressions on humans, chimpanzees and other animals. They not only study differences between human eye gaze and chimpanzee eye gaze but also individual characteristics among the chimpanzees.

Access to information such as looking behavior, duration, focus points, etc., in these areas provide drastic changes in great ape cognition studies.



Scan path of chimpanzee. Scan path of human.

Study sessions

The team invites the chimpanzees to participate in study sessions in the morning at 9 and in the afternoon at 2. The duration of each session is about 10 to 15 minutes. Participation is voluntary and depends on the individual's wish to cooperate on that day.

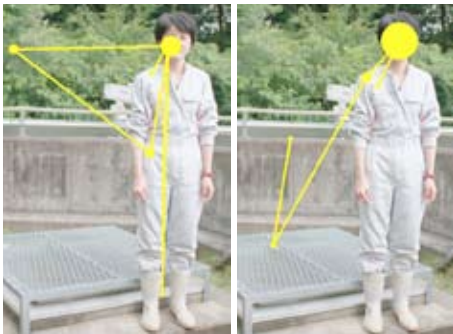
The institute has 6 research cells for the projects and the studies are conducted with two chimpanzees in each study cell. Each cell has two workstations and the chimpanzees are occupied with their respective task. One of the tasks may include eye tracking. During the task they get rewarded with small pieces of cut fruit for each correct action carried out. After a while they take turns and switch tasks.

Preliminary findings

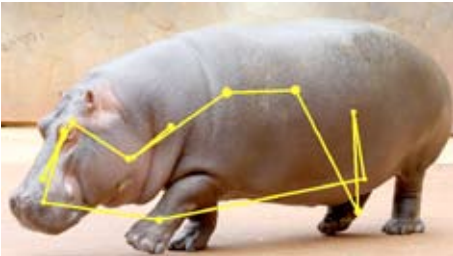
The research team is still in the phase of collecting preliminary data on how the chimpanzees scan still images of humans, chimpanzees and other animals. Above and below are typical examples of scan paths by chimpanzees and humans, superimposed on pictures of chimpanzees, humans and

other mammals. By comparing these eye movements, the researchers try to find similarities and differences in scene and body viewing of the two closely-related primates.

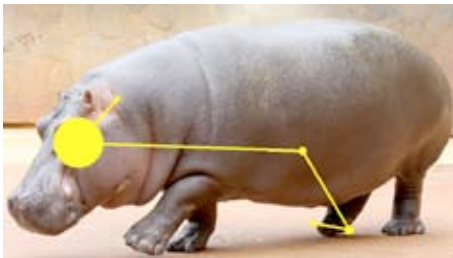
With the results of the initial studies in place the team will start to address the many various questions they have. Hopefully, they will find many interesting approaches to new and innovative research with eye tracking that will further contribute to the institute's renowned reputation within primate research!



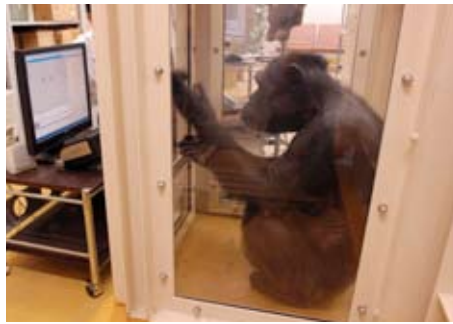
Scan path of chimpanzee. Scan path of human.



Scan path of chimpanzee.



Scan path of human.



A Tobii X120 Eye Tracker is calibrating the eyes of the chimpanzee.

Why Tobii?

The team is using Tobii X120 Eye Trackers together with Tobii SDK, ClearView, and Tobii Studio and have developed their own way of analyzing the data.

For the eye tracker to work in their research environment, Dr. Tomonaga and the team needed a system that was unobtrusive and, of course, non-invasive for the chimpanzees. The eye tracker also had to be quick and easy to calibrate as well as stable during the task. It had to be easy to connect and set up and compatible with the system they were already using. Tobii's eye tracker seemed to be the most hopeful and possible solution.

About Primate Research Institute, Kyoto University

The institute works toward understanding the biological, behavioral and socio-ecological aspects of primates and the origin and evolution of man. The Language and Intelligence Section aims to understand the higher cognitive functions in the great apes, especially in the chimpanzee, the closest relative of humans. Both experimental and observational approaches illuminate the similarities and the differences between human cognition and ape cognition.

All chimpanzee research at the Primate Institute at Kyoto University is non-invasive. The research team have been conducting development research of chimpanzees for more than 30 years! They have 14 chimpanzees at the institute right now: three young chimpanzees, eight adults and three elderly chimpanzees.



Many thanks to the Primate Research Institute at Kyoto University.

To find out how
Eye Tracking
can improve your
research, please visit
www.tobii.com or contact
one of our offices.

EMEA
Tobii Technology AB
Karlavägen 2D
S-182 53 Danderyd
Sweden
+46 8 663 69 90 Phone
+46 8 30 14 00 Fax
sales@tobii.com

NORTH AMERICA
Tobii Technology, Inc.
510 N. Washington Street
Suite 200 - Falls Church,
VA 22046 - USA
+1-703-738-1300 Phone
+1-888-898-6244 Phone
+1-703-738-1313 Fax
sales.us@tobii.com

ASIA
Tobii Technology, Ltd.
3-4-13 Takanawa, Minato-ku
Tokyo 108-0074
Japan
+81-3-5793-3316 Phone
+81-3-5793-3317 Fax
sales.jp@tobii.com

CENTRAL EUROPE
Tobii Technology GmbH
Niedenau 45
D-60325 Frankfurt am Main
Germany
+49 69 24 75 03 40 Phone
+49 69 24 75 03 429 Fax
sales.de@tobii.com