PRESS RELEASE

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Sweet memories: What chimpanzees remember from past feeding experiences

Positive emotional experiences may trigger spontaneous prospective memory retrievals in foraging chimpanzees

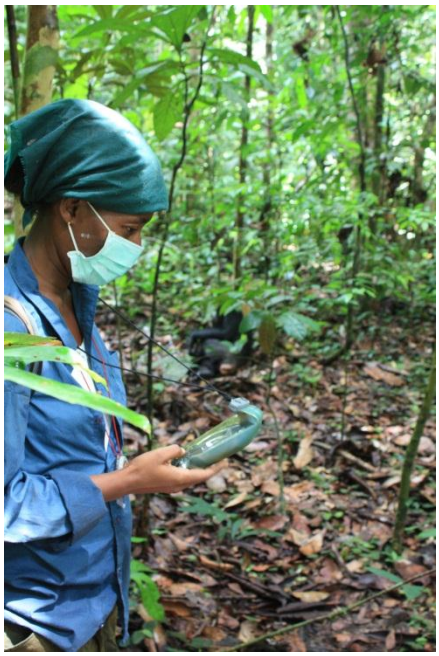
An international team of researchers from the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and the Félix Houphouët Boigny University in Abidjan, Ivory Coast were the first to study which specific information from previous feeding visits wild chimpanzees take into account when they revisit the same fruit trees. To this end the researchers followed five female chimpanzees from Taï National Park, Côte d'Ivoire, for extended periods of time. They found that chimpanzees direct their travels from longer distances towards trees that carried the best fruit in the past. The study further suggests that these revisits are triggered by positive emotions experienced during previous visits.

Fig. 1: Female chimpanzees feeding on rainforest fruit (Credit: K. Janmaat, MPI-EVA)

Wild chimpanzees can feed on up to 21 fruit trees per day and revisit feeding trees on average every three days. However, sometimes revisit intervals can be as long as 26 days or more. So, what do chimpanzees still remember about past feeding experiences after such long intervals, and how do they decide at which moment it is best to direct their travels towards these feeding trees?

Simone Ban of the Félix Houphouët Boigny University and Karline Janmaat of the Max Planck Institute for Evolutionary Anthropology followed five adult females for exceptionally long periods of up to 44 consecutive days, for a total of 275 days, and obtained a unique consecutive record of these chimpanzees' feeding experiences. They recorded the distance at which these chimpanzees directed their travels towards previously visited feeding trees and analyzed how previous feeding experiences and fruit tree properties influenced this distance in a comparative analysis. To exclude the influence of sensory cues, the researchers measured the females' approach distance from their last significant change in travel direction until the moment they entered the tree's maximum olfactory and visual detection field.

Simone Ban found that chimpanzees travelled longer distances to high-valued trees at which they had previously made food grunts and had rejected fewer fruits as compared to other trees. In addition, the results suggest that the chimpanzees were able to anticipate the amount of fruit that they would find in the trees.



Overall, the findings suggest that chimpanzees act upon a retrieved memory of previous feeding experiences that took place a long time before they revisited the trees. The results furthermore propose that positive emotional experiences, such as those experienced during food grunting, help to trigger spontaneous prospective memory retrieval in forest areas that are further away and have fewer cues associated with revisited feeding trees.

"The daily changes in travel direction towards the feeding trees that the chimpanzees revisited occurred on average 80 minutes before the actual feeding took place. This suggests a daily use of an exceptionally long-term prospective memory", says Simone Ban of the Félix Houphouët Boigny University.

Fig. 2: Simone Ban recording data in the Taï National Park, Côte d'Ivoire (Credit: K. Janmaat, MPI-EVA)

"Our study provides an encouraging first step in investigations on the role of emotional salience on memory retrieval in wild foraging animals", says Karline Janmaat of the Max Planck Institute for Evolutionary Anthropology.

[KJ, SJ]

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