

Have we met? Research finds 'missing social knowledge'

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(PhysOrg.com) -- The face looks familiar but... Just as humans don't always know their neighbors, new research at the University of Michigan shows even the most social of animals don't always recognize individuals they regularly encounter, the first known evidence of "missing social knowledge" in non-human primates.

University of Michigan researcher Thore Bergman, an assistant professor of psychology and ecology and [evolutionary biology](#), details his findings in the journal *Proceedings of the Royal Society B*, a flagship journal in the biological sciences.

The study looked at individual recognition in male geladas (*Theropithecus gelada*, close relatives of baboons) that live in fluid, multilevel groups that can number more than 1,200 individuals—10 times larger than baboon groups.

Most primates live in stable groups of individuals that are always together. But geladas society is more complicated. Just as humans have varying levels of associations with different people, geladas have different degrees of overlap with other geladas. At one end is the harem, a cohesive group of 10-20 geladas that is always together. At the other end is the herd, extremely large aggregations of harems that may only rarely come together.

In between, are bands, groups of three to 20 harems, that are together the majority of the time. What Bergman wanted to know was, "what are the

limits of recognition in this fluid social system?"

Among humans, social scientists have developed an axiom known as "the Rule of 150" arguing that it is difficult for the average human to retain a great deal of information on more than 150 people, leading to a tendency for large organizations to subdivide into smaller and smaller sub-groups.

But studying the evolution of this phenomenon has been difficult because most of our primate relatives live in relatively small, stable groups (well under 150 individuals) where everyone knows each other. This is where geladas come in.

By observing how geladas responded to playbacks of different calls, Bergman found recognition only among geladas with the very highest levels of overlap. This finding "suggests that geladas are either unable or unmotivated to keep track of the individual identities of other males in their multi-level society—even males with whom they have a high degree of social overlap," Bergman writes.

For years, scientists have pursued the social intelligence hypothesis, the idea that solving social problems has driven the evolution of intelligence, not only in humans but also in other big-brained species.

The missing social knowledge of geladas actually supports this hypothesis.

"This finding is potentially significant because if sociality drives cognitive evolution, then we would expect to see evidence that sociality is cognitively challenging," he said.

Keeping track of other individuals is one aspect of living in large, complex societies that might be difficult, Bergman said. However, it has yet to be demonstrated that keeping track of social information is, in

fact, challenging for primates.

"Whenever people have looked for social knowledge among primates, they have found it," Bergman said. "Think of the following analogy. A cheetah's fast speed has evolved to catch its prey. But if every time you watched a cheetah hunt, they indeed caught the prey, you would have no reason to think the task difficult enough to push evolution in a certain direction.

"It is not until you have evidence that the animal can fail at the task that you begin to see evolution at play. With geladas, we have the first evidence that primates can 'fail' at a social knowledge task. Of course, the geladas may simply choose to ignore those around them, but even that suggests that keeping track of this information has some costs."

Bergman has spent more than a decade studying the social skills of primates in the wild, including social cognition, mating strategies, social status and mate choice.

Bergman also studies gelada signaling and vocal communication patterns, which include about 30 distinctly different calls ranging from friendly vocalizations to warning calls given to predators. Living in large groups may have favored the evolution of more vocalization types in geladas, as compared to baboons.

Male geladas overseeing harems of females are incredibly responsive to bachelor geladas who represent a potential threat, monitoring their location just as they monitor predators but otherwise, Bergman reports, "geladas have ample opportunities to learn to recognize other animals in their band, yet they do not."

More information: Proceedings of the Royal Society B - rspb.royalsocietypublishing.org/

Provided by University of Michigan

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