

Owl monkeys don't cheat, study shows

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An infant owl monkey rides securely on the back of its biological father. A Penn study showed that owl monkeys are faithful mates, and that intensive parenting by the biological father likely plays a role in this loyalty. Credit: V. Davalos/Owl Monkey Project, Formosa-Argentina

True monogamy is rare in the animal kingdom. Even in species that appear to "mate for life," genetic maternity and paternity tests have

revealed that philandering often takes place.

Yet a new study by University of Pennsylvania researchers shows that Azara's [owl monkeys](#) (*Aotus azarae*) are unusually faithful. The investigation of 35 offspring born to 17 owl monkey pairs turned up no evidence of cheating; the male and female monkeys that cared for the young were the infants' true biological parents.

An additional analysis of 15 pair-living mammals by the Penn team found a strong connection between a [species'](#) faithfulness and significant involvement of males in caring for their young.

"Our study is the first of any primate species, and only the fourth for a pair-living mammal, to show genetic monogamy, or real faithfulness, between partners," said study author Eduardo Fernandez-Duque, an associate professor in Penn Arts and Sciences' Department of Anthropology. "Paternal care in owl monkeys now makes sense. The males are making a huge investment in their own offspring."

Fernandez-Duque collaborated on the work with lead author Maren Huck, who completed a postdoctoral fellowship in his lab and is now a lecturer at the University of Derby, as well as professor Theodore Schurr of Penn's Department of Anthropology and Paul Babb, who completed his Ph.D. with Fernandez-Duque and Schurr and is now a postdoctoral research at Penn's Perelman School of Medicine. The study will be published in *Proceedings of the Royal Society B: Biological Sciences*.

As part of the Owl Monkey Project, the Penn evolutionary anthropologists have been studying a population of these primates in Argentina's Chaco region for 18 years. Previous work had shown that male and female owl monkeys form strong pair-bonds and that males contribute significantly to raising young by carrying them on their bodies, playing with them and feeding them solid foods.

Though the species was known to be socially monogamous, no one had tested whether the species was genetically monogamous—in other words, whether there were any cases of females reproducing with a male other than her mate, a behavior known as extra-pair paternity.

To test this, the researchers paired behavioral field observations with genetic tests to see whether the "social" mothers and fathers of infant monkeys were the [biological parents](#). They collected samples from 128 individual monkeys living in 29 groups or as solitary "floaters." This set included genetic samples from 35 infants born to 17 reproducing pairs.

By examining 14 different regions of the genome, the research team's analysis strongly suggested that owl monkeys were completely faithful. They found no evidence of extra-pair paternity.

"In the 18 years of the Owl Monkey Project, we never witnessed a little sneaky copulation with a neighbor, or that one partner dashed off for some time," Fernandez-Duque said. "So in that sense we were not very much surprised by our results. But true genetic monogamy is very rare. We would not have been surprised if there had been at least one non-pair infant, but there were none."

Indeed, no other robust study of primates has demonstrated genetic monogamy. It has been shown in only four other mammal species, including coyotes and the California mouse.

Because the researchers were interested in how genetic monogamy has evolved and the conditions under which it occurs, they went on to perform an analysis of 15 mammal species that have been shown to live in socially monogamous pairs and for which paternity studies have been conducted. In addition to the owl monkeys, this group included birds, rodents and canines.

The results of this broader investigation showed that species in which males contribute significantly to infant care were more likely to be genetically monogamous. They also found an association between the strength of the bond between mates—that is, the percentage of time the male and female spent together—and low levels of extra-pair paternity, but this connection was not as strong.

Though their results underline the presence of a connection between intense male care for young and faithfulness, the researchers say they cannot yet tell which condition gives rise to the other. They also note that other factors, including the ecological conditions in which a species dwell, play a role.

"Male care is surely not the only factor explaining genetic monogamy," Huck said. "Some of the species that show male care have, due for example to their foraging habits, much more opportunities for seeking extra-pair copulations than owl monkeys."

The team also noted that being a good dad can also be a mating strategy in and of itself; females might be attracted to males that appear to be good dads.

These findings in the owl monkey and other species can begin to help explain the evolution of pair-bonds in another primate species: human beings.

"Pair bonding, love if you want, is prevalent in all human societies, whereas fathering is much more variable," Fernandez-Duque said. "The owl monkey story is suggesting that, under very specific ecological settings, this preference for each other leads to the pair spending a lot of time in close proximity, thus facilitating paternal care and increasing paternity certainty. Genetic monogamy is the result."

More information: Correlates of genetic monogamy in socially monogamous mammals, [rspb.royalsocietypublishing.org ...
.1098/rspb.2014.0195](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2014.0195)

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