

Baboon dads have surprising influence on daughters' fitness

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Polygamous baboon fathers get more grandchildren if they spend a little time with their children during their juvenile years, according to research directed by scientists at Duke and Princeton universities.

The findings, in well-studied social groupings of yellow baboons living at the foot of Africa's Mt. Kilimanjaro, were unexpected in "multi-male" animal societies where both genders have multiple partners and mature males were thought to focus their energies almost solely on mating.

"In such societies, the scientific dogma has very much been that males do not contribute to their offspring's fitness," said Susan Alberts, a Duke associate professor of biology. "They're not supposed to be engaged in a level of care that would make any difference."

Scientists have long known that mothers have major effects on daughters' fitness in these kinds of animal societies. But dads have previously been invisible in the fitness stories because paternity information was unavailable until recent genetic research was included in a few studies such as this one.

In a report appearing in the online edition of the *Proceedings of the National Academy of Sciences* on Feb. 4, 2008, Alberts and her colleagues found that the more time fathers spent living with their young daughters, the earlier the daughters reached menarche, the onset of menstruation.

"A female who can start earlier has a longer reproductive life," said Alberts, the report's senior author. "So starting out early is good."

Alberts' post-doctoral associate Marie Carpentier -- the first author -- and Jeanne Altmann of Princeton -- the corresponding author -- collaborated with her at a research site in Kenya's Amboseli basin, where the wild baboon population has been under meticulous observation since 1971.

Their new study, funded by the National Science Foundation in the United States and a Marie-Curie Outgoing Fellowship in France, follows up on a previous report by Altmann, Alberts and others in the Sept. 11, 2003, edition of the research journal *Nature*.

That *Nature* report described evidence that yellow baboon males at the Amboseli site could recognize their own offspring and also exhibit paternal care by supporting their own sons and daughters in disputes with other juveniles.

The 2008 PNAS report, also co-authored by Russ van Horn of the Zoological Society of San Diego, used 30 years of field observations and genetic data on 118 youthful yellow baboons and their known fathers to assess how paternal presence affected offspring fitness.

As the most easily accessible measure of long-term fitness, the researchers investigated how soon a father's offspring reached sexual maturity.

After separating-out confounding factors -- such as the natural fitness advantages children of high ranking mothers gain in matriarchal baboon societies -- the authors found that fatherly presence itself gives offspring a jump-start on reproduction -- most strikingly among females.

The authors added that "sons also experienced accelerated maturation if their father was present during their immature period, but only if their father was high-ranking at the time of their birth."

They acknowledged that the finding for sons was a "puzzle." However, one likely answer lies in the difference in size and dominance of adult male and female baboons. While mature males dominate females, being twice as large, "it's a matriarchal society in the sense that females are the stable members of social groups and their daughters remain with them," Alberts said.

"For young females, because their major opponents in life are adult females and fellow juveniles, the presence of any adult male may be helpful," she said.

"But for maturing sons, it may be that it's not really the females they're dealing with; it's the adult males they have to worry about. And in that case, only the presence of a high-ranking dad would be helpful."

The researchers were able to assess adult male pecking orders by looking for gestures of dominance or submission.

Baboons of either gender do not share food after their mothers cease nursing. "But ties between fatherly presence and early maturity may still stem from enhanced nutrition if fathers reduce any harassment their offspring experience while gathering food," she added. "It may also help reduce the stress of everyday life in a baboon group."

The paternal assistance her research group documented in yellow baboons may also be at work in other types of monkeys, she added. "I think our data make a strong case that should be looked at," she said.

Source: Duke University

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