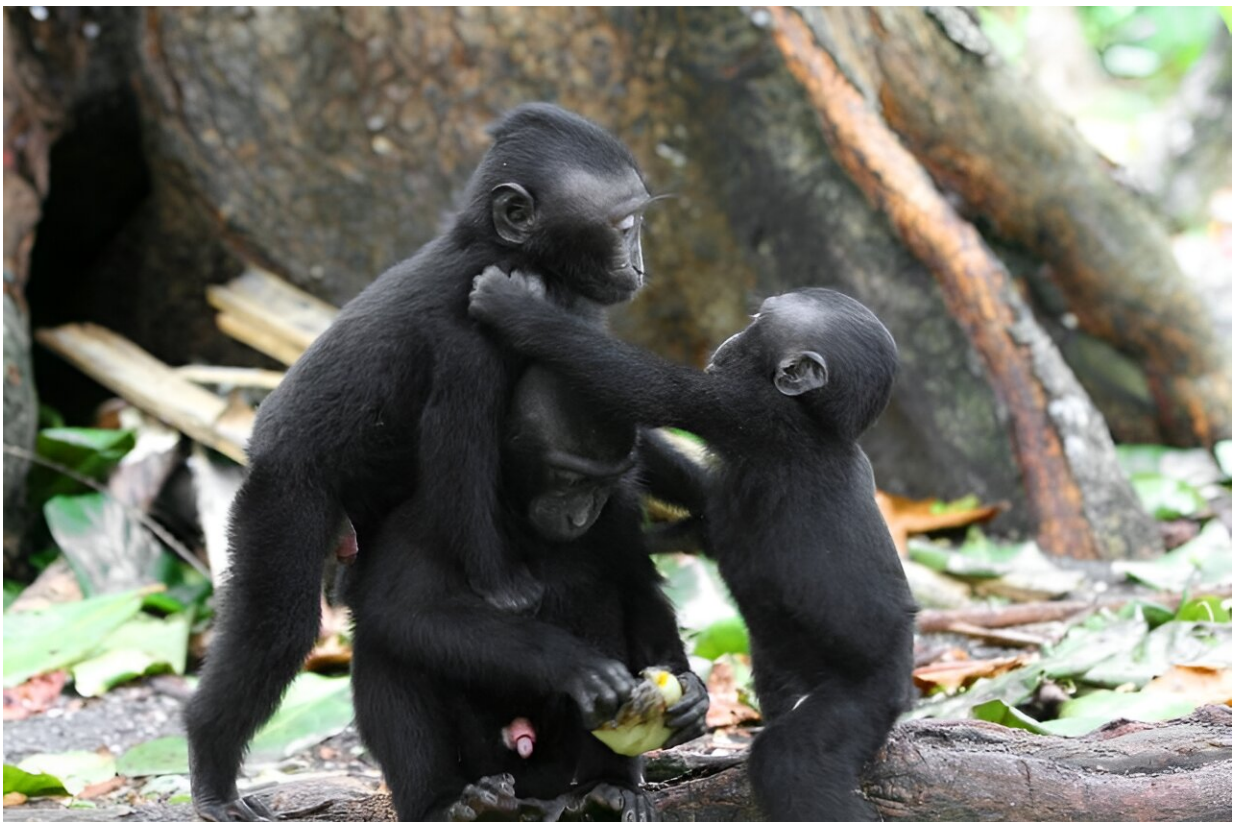


Male crested macaques more likely to respond to screams from their own offspring, study finds

August 29 2023, by Susann Sika



Crested macaque infants learn many of their species-specific behavioral patterns through play with their peers. Credit: Jerome Micheletta, Macaca Nigra Project (MNP)

When infants are involved in agonistic conflicts, male crested macaques (*Macaca nigra*) are more likely to respond to screams from their own offspring. This is the conclusion of a recent study led by behavioral ecologist Professor Anja Widdig from Leipzig University and the Max Planck Institute for Evolutionary Anthropology in Leipzig as part of the Macaca Nigra Project (MNP). The researchers studied the behavior of crested macaques in the Tangkoko Nature Reserve on Sulawesi, Indonesia, over a 24-month period (2008 to 2010).

A special issue of the *International Journal of Primatology* dedicated to these endangered animals has just been published. It marks the 17th anniversary of the Macaca Nigra Project.

Primate infants face many dangers. They are dependent on help to survive, especially in the first year of life. Mothers take on the main burden of parental care in primates. Because the survival of their offspring is essential for males too in order to pass on their genes, fathers can, for example, protect their offspring during conflicts.

"Many [primate species](#) live in groups of several males and females. Promiscuous mating raises the question of whether males can even recognize their genetic offspring. The aim of this behavioral study was therefore to investigate how males respond when infants scream for help," says Professor Widdig.

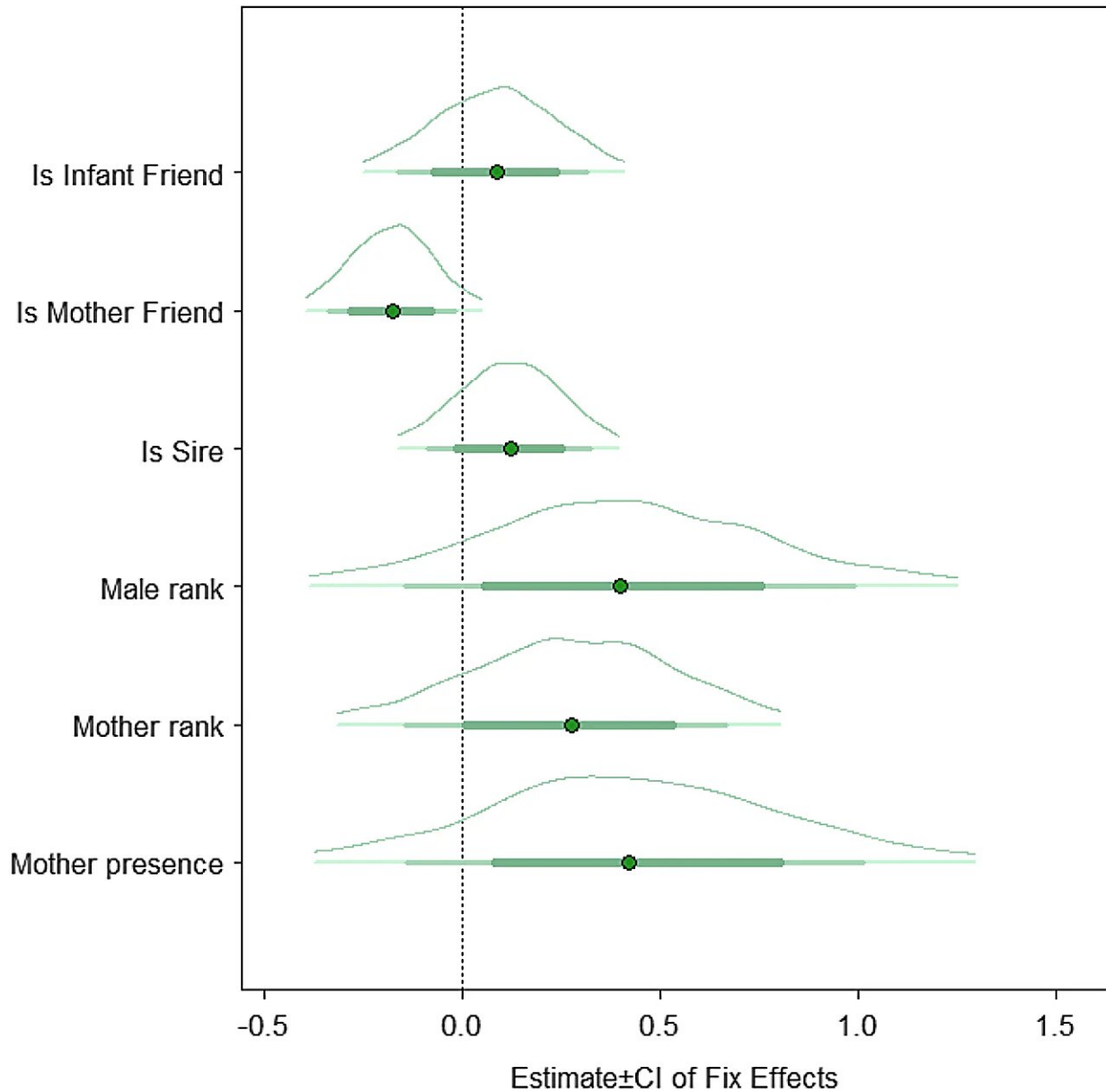
Her team observed conflicts involving infant crested macaques. The youngsters often scream in order to get support. In over 3,600 hours of observation in three study groups, the researchers registered over 2,600 infant screams for help. They then analyzed the male crested macaques' responses to the infants' screams.

The researchers found that males were more likely to respond to an infant's screams if they were the infant's father, the infant's friend and/or

the mother's friend. In addition, males were more likely to react to the screaming offspring if they themselves were of high dominance rank, i.e. likely sired many of these infants themselves, or if the screaming infant and its mother were of low dominance rank, i.e. particularly dependent on help. In contrast, whether males responded to infants' screams did not depend on the presence of the mother at the conflict site.

The scientists concluded that male crested macaques may have some cues available to assess which infants they have sired. Despite this, males generally seem to intervene infrequently and even help unrelated infants. The data collected showed, for example, that infants who screamed for help were mainly involved in conflicts with adult males or females from their [social group](#) (42% and 46% respectively). Males may therefore assess the risk of their intervention in order to avoid potential conflicts with male rivals.

"Although previous studies on this primate species have found that fathers do not specifically establish [social relationships](#) with their offspring, this study shows that fathers do invest in supporting their offspring, albeit in a very limited way," says Professor Widdig. She adds that this confirms the findings of other studies that males form social bonds with their offspring or tolerate their young at feeding sites, but rarely actively support their offspring in conflict situations.



Model estimates for all predictors of male responses to infant screams in crested macaques at Tangkoko Nature Reserve (Sulawesi) between 2008 and 2010. Plot shows the estimates (dots; mean of the posterior distribution) and the 65%, 85%, and 95% credible intervals (green lines) for all six predictors tested. The density of the posterior distribution is shown as curved line above the horizontal credibility intervals. Credit: *International Journal of Primatology* (2023). DOI: 10.1007/s10764-023-00381-8

Based on their observations, the researchers believe that any form of paternal care is subtle and limited to certain situations, but may have evolved due to the high infant mortality in crested macaques.

There are several possible explanations for the paternal restraint: the simplest may be that crested macaque offspring just do not benefit from spatial associations and social bonds with their fathers, so neither fathers nor offspring invest in such relationships on a daily basis. Another explanation could be a lack of time.

Although potentially beneficial, fathers might simply be unable to spend much time with their offspring. The time available for males to interact with their [offspring](#) appears to be severely limited, which the researchers attribute to the fact that crested macaques can only defend their alpha status for an average of twelve months. The males therefore probably invest all this time in mating with as many fertile females as possible before migrating to another group.

"It is still unclear whether the support of young macaques by unrelated males is actually an active male strategy or a misjudgment of paternity by the male," says the behavioral ecologist.

The Macaca Nigra Project (MNP) is an international collaboration established in 2006. Today, the MNP is led by scientists from Indonesia (Bogor Agricultural University), France (National Centre for Scientific Research and National Museum of Natural History, Paris), the United Kingdom (University of Portsmouth) and Germany (Leipzig University and Max Planck Institute for Evolutionary Anthropology, Leipzig).

The MNP operates a field station on Sulawesi, Indonesia, an island known as a biodiversity hotspot. The fieldwork is carried out in the Tangkoko Nature Reserve, which is located at the northernmost tip of Sulawesi and covers more than 8,700 hectares. Here, one of the largest

remaining populations of the critically endangered crested macaques is being studied in its natural environment. The MNP focuses on research, environmental education and conservation.

As well as studying the behavior, physiology and ecology of this species, the project works with local authorities and non-governmental organizations to promote the conservation of these primates. Long-term data from around 500 animals in their natural environment, from birth to death, provides important insights into primate social evolution and behavioral ecology, as well as genetic diversity and inbreeding depression, ecology and climate change, highlighting the project's interdisciplinary research approach.

The MNP has also attracted attention for its environmental education programs. Since 2011, it has been organizing activities to provide schoolchildren, teachers and adults from the villages around the Tangkoko Nature Reserve with information and resources about the rainforest, climate, water cycle, fauna, flora and crested macaques, in order to increase their knowledge about the protection of indigenous nature and biodiversity.

The researchers have reached more than 5,000 people since the project began. The program is part of the official school curriculum in two villages near the Tangkoko Nature Reserve. The Leipzig team also led the first quantitative analysis of the success of the [environmental education](#) program, which is also featured in the special issue.

More information: Daphne Kerhoas et al, Do Wild, Male, Crested Macaques (*Macaca nigra*) Respond to the Screams of Infants Involved in Agonistic Interactions?, *International Journal of Primatology* (2023).
[DOI: 10.1007/s10764-023-00381-8](https://doi.org/10.1007/s10764-023-00381-8)

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