Close social ties make baboons better mothers

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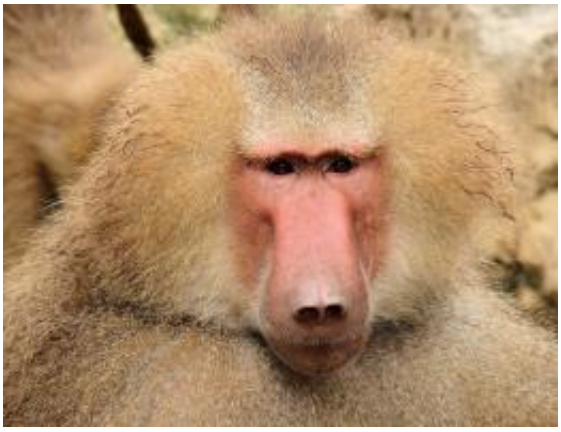

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Baboons whose mothers have strong relationships with other females are much more likely to survive to adulthood than baboons reared by less social mothers, according to a new study by researchers at UCLA, the University of Pennsylvania and other institutions.

"If you're a baboon, the strength of your mother's relationship with other females is the best predictor of whether you'll live to have children yourself," said Joan Silk, the study's lead author and a UCLA professor of anthropology. "The study adds to mounting evidence of the biological benefits of close relationships among females."

The findings are significant because "survivorship to reproduction is the

gold standard in evolutionary biology," said co-author Dorothy Cheney, a professor of biology at the University of Pennsylvania. "Females who raise offspring to a reproductive age are more likely see their genes pass along, so these findings demonstrate an evolutionary advantage to strong relationships with other females. In evolutionary terms, social moms are the fittest moms — at least when it comes to baboons."

The study appears online in the *Proceedings of the Royal Society B,* a peer-reviewed journal published by the national academy of science of the United Kingdom and the Commonwealth.

Silk, Cheney and seven other researchers from the University of Pennsylvania, the University of Michigan and the University of St. Andrews in Kenya analyzed 17 years worth of records on more than 66 adult female baboons in the Moremi Game Reserve, a 2,000-square-mile national park in Botswana that teems with wildlife.

Collected on the ground by primatologists who tracked the baboons six days a week, 12 months a year, the records reflected the sex and survival rates of baboon offspring, as well as telling details of the mothers' social lives, including their ranking within the group, as measured by the direction of approach/retreat interactions, and the amount of social interactions they had with each of the group's other females.

In addition to showing how often one animal approached another, the records of social interactions included details of grooming, which is known to be the primary form of social interaction in Old World monkeys. The researchers noted how much time — frequency and duration — the females spent grooming each other and how often they solicited grooming from other females.

Of all the factors studied, the strength of a mother's social bonds with

another female had the most significant effect on the survival rates of offspring. A mother's dominance rank proved to have no affect on the survival rate of her offspring.

"We really expected dominance status to be more influential than it proved to be," Silk said.

Offspring from the most social mothers turned out to be about one-and-a-half times more likely to survive to adulthood than offspring from the least social mothers.

The strongest social bonds were measured between mothers and adult daughters, followed by sisters and all other potential relationships, including aunts, nieces, cousins and baboons with no familial ties. Bonds between mothers and adult daughters proved to be three times stronger than those between sisters and 10 times stronger than relationships with other females.

"What really matter to these girls are mother-daughter bonds," Silk said. "They're really strong, and they last forever. If your mom is alive, she's one of your top partners, always. But more importantly, it's the strength of these bonds, because females whose bonds with their mothers and daughters were strong had higher offspring survival than females whose bonds with these relatives were weak."

Silk's past research with Jeanne Altmann, the Eugene Higgins Professor of Ecology and Evolutionary Biology at Princeton University, and Susan C. Alberts, a professor of biology at Duke University, on baboons in the Amboseli Basin of Kenya had found a higher survival rate for baboons with social mothers, but the research only tracked offspring through the first year of life.

For the new study, researchers followed offspring from 1 year of age

through sexual maturity — roughly 5 years of age. The new study also differs from past baboon research by focusing on the strength and duration of relationships between pairs of females rather than on the amount of social interactions in general.

"The benefit comes not from being wildly social — it's about having close social bonds," said Cheney, who runs the Moremi baboon-tracking project with University of Pennsylvania psychology professor Robert M. Seyfarth.

"These females form strong relationships with particular partners," Silk said. "They don't treat everyone the same. They spend a lot more time with — and a lot more time grooming — some females than others, and these relationships tend to be very long-lasting."

Additional research is needed to determine how the female bonds improve infant survival, but it may have to do with such stress hormones as cortisol, Silk said. Research has shown that prolonged elevations of stress hormones in primates can lead to cardiovascular disease and other serious health problems. Research has also shown that grooming tends to lower these stress hormones in baboons.

"Our research suggests that somehow there is a link between the kind of social relationships you form and the natural, normal stresses that occur in everyday life, and that seems to have — at least in baboons — a long-term effect on reproductive success," Silk said.

Said to share 92 percent of their DNA with humans, baboons are close relatives of humans. Baboons and humans last shared a common ancestor about 18 million years ago. The new findings on social interactions among mothers parallel recent research that has shown health benefits for humans who enjoy particularly close social networks.

"Our findings suggest benefits from forming close relationships are built into us from a long way back," Silk said.

Source: University of California - Los Angeles