

Scientists connect baboon personalities to social success, health benefits

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This shows baboons grooming. Credit: Anne Engh, University of Pennsylvania

Whether human or baboon, it helps to have friends. For both species, studies have shown that robust social networks lead to better health and longer lives. Now, a team of University of Pennsylvania researchers has helped show that baboon personality plays a role in these outcomes, and, like people, some baboons' personalities are better suited to making and keeping friends than others.

The research was conducted by psychology professor Robert Seyfarth and biology professor Dorothy Cheney, both of Penn's School of Arts and Sciences. They collaborated with the Arizona State University's Joan Silk.

Their work was published in the [Proceedings of the National Academy of Sciences](#).

Seyfarth and Cheney, along with their colleagues and students, have spent the last 17 years observing a group of baboons living in the Moremi Game Reserve in Botswana, studying the biological roots of their [social dynamics](#). As with many other primates, baboon societies are strongly hierarchical. Females "inherit" their dominance ranks from their mothers and enjoy priority of access to food and mates. But high-ranking females do not always have greater [reproductive success](#) than low-ranking females. This suggests that, when it comes to [evolutionary success](#), the inherited advantage of high rank can't explain everything.

"If you look at a baboon society," Seyfarth said, "and see the ranked, matrilineal families, you would think that whatever traits put an individual at the top of the hierarchy, that's what natural selection is going to favor. But that turns out not to be the case.

"In fact, dominance rank is not as good a predictor of reproductive outcomes as a close network of [social relationships](#) and [stable relationships](#) over time. So our question became 'What predicts having a strong network?'"

Baboon females actively work to maintain close social bonds, but, like humans, some baboons seemed to be better at it than others. With such traits closely tied to fitness and reproductive success, the Penn researchers wanted to get at the root of this variation.

During seven years of observations in the animals' natural habitat, the researchers measured individual female baboons on their sociability. They measured the number of grooming partners a baboon had, as well her tendency to be friendly or aggressive toward others. They also measured reproductive and fitness benefits they accrued: how long

individuals and their offspring lived, as well as their stress levels, as determined by the presence of certain hormones in their droppings.

The researchers found that strength of an individual's social bonds was not fully predicted by seemingly obvious factors, such as the female's rank or the size of the family she was born into.

"Even when a female has a lot of relatives," Cheney said, "sometimes she's a loner, but some females who have no relatives do just fine. It suggests that you have to be both lucky and skilled to have these networks."



This shows baboons grooming. Credit: Anne Engh, University of Pennsylvania

And, again like humans, these skills came down to individual personality traits. To determine a female's personality, the researchers paid close attention to grunting behavior. For baboons, grunting greases the social wheels. If a lower-ranking female grunts when approaching a higher-ranking female, the grunt acts as a kind of appeasement, reducing the chance of receiving aggression. Conversely, if a higher-ranking female grunts to a lower-ranking female, the grunt puts her at ease, increasing

the chance of a friendly social interaction. And females of all ranks grunt when approaching a mother with an infant, because grunts increase the likelihood that the mother will allow the grunter to interact with her child.

Working bottom up from the trends they found in the baboon's behavior, the researchers grouped the [baboons](#) into three distinct personality profiles: "nice," "aloof" and "loner."

Nice females were friendly to all others and often grunted to lower-ranking females to signal reassurance. They formed strong and enduring social bonds with fairly consistent partner preferences over time.

Aloof females were more aggressive and less friendly, and they grunted primarily to higher-ranking females who had infants. They formed weaker bonds but had very consistent partner preferences.

Loner females were often alone and relatively unfriendly; they grunted primarily to appease higher-ranking females without infants. They formed weak bonds with changing partners.

Of the three, the loners had the highest stress levels, the weakest social bonds and the least stable social partners over time. Both of these measures were correlated with lower offspring survival and shorter lifespans. Both nice and aloof [females](#) showed the health and reproductive benefits associated with strong social bonds.

"This belies the idea that everything is competition and conflict," Cheney said.

While the mechanisms that make both "nice" and "aloof" effective strategies remains unclear, the study shows that cooperative personalities are adaptive.

"These results have allowed us to, for the first time in a wild primate, link personality characteristics, social skill and reproductive success," Seyfarth said. "By being a nice baboon, you increase the likelihood of having strong [social bonds](#), which in turn translates to a better chance of passing on your genes."

More information: "Variation in personality and fitness in wild female baboons," by Robert M. Seyfarth, Joan B. Silk, and Dorothy L. Cheney, *PNAS*, 2012.

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