

## It's best to make friends of friends—even the spotted hyena knows that

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Spotted hyenas are affected by the structure of their social network when forming and maintaining social bonds, according to a new study of the long-term dynamics of hyena social networks, according to a new study. Credit: Amiyaal Ilany



Bonding with a friend of a friend is something most humans gravitate toward naturally, or at least Facebook likes to think so every time it suggests friends for you to "friend."

But a certain four-legged predator, the <u>spotted hyena</u>, seems to know the benefits of this type of social bonding instinctively, according to a new study from the National Institute for Mathematical and Biological Synthesis (NIMBioS) that considers the structural factors affecting the social network of these animals.

Researchers collected more than 55,000 observations of social interactions of spotted <u>hyenas</u> over a 20 year period in Kenya, making this one of the largest to date of social network dynamics in any non-human species.

They found that cohesive clustering of the kind where an individual bonds with friends of friends, something scientists call "triadic closure," was the most consistent factor influencing the long-term dynamics of the social structure of spotted hyenas.

Individual traits, such as sex and social rank, and environmental effects, such as the amount of rainfall and the abundance of prey, also matter, but the ability of individuals to form and maintain social bonds in triads was key, according to the study, which appears today in the journal *Ecology Letters*.

"Cohesive clusters can facilitate efficient cooperation and hence maximize fitness, and so our study shows that hyenas exploit this advantage. Interestingly, clustering is something done in human societies, from hunter-gatherers to Facebook users," explained lead author Amiyaal Ilany, who conducted the research as a NIMBioS postdoctoral fellow. Ilany is currently a postdoctoral fellow at the University of Pennsylvania.



Hyenas, which can live up to 22 years, typically live in large, stable groups known as clans, which can comprise more than 100 individuals. Socially sophisticated animals, these predators can discriminate maternal and paternal kin from unrelated hyenas and are selective in their social choices, tending to not form bonds with every hyena in the clan, rather preferring the friends of their <u>friends</u>, the study found.

The study found that hyenas follow a complex set of rules when making social decisions. Males follow rigid rules in forming bonds, whereas females tend to change their preferences over time. For example, a female might care about <u>social rank</u> at one time, but then later choose based on rainfall amounts.

"In spotted hyenas, females are the dominant sex and so they can be very flexible in their social preferences. Females also remain in the same clan all their lives, so they may know the social environment better. In contrast, males disperse to new clans after reaching puberty, and after they disperse they have virtually no social control because they are the lowest ranking individuals in the new clan, so we can speculate that perhaps this is why they are obliged to follow stricter social rules," said co-author Kay Holekamp, a zoologist from Michigan State University.

Knowing why and how these animals form lasting relationships can help scientists better understand cooperation patterns and the consequences of sociality in other species.

The researchers used a new, more comprehensive method than those used in earlier studies, a type of mathematical modeling typically found in sociology, to arrive at their findings about the social world of the spotted hyena.

This more dynamic approach allowed the researchers to evaluate the simultaneous effects of multiple factors—environmental, individual,



genetic and structural—on network dynamics. It also gave the researchers a peek into how or why the social structure changes over time and to isolate the factors that shape the structure. The method represents a major advance over methods used in previous studies of animal social networks where more static approaches have typically been applied.

**More information:** Ilany A, Booms A, Holekamp K. 2015. Topological effects of network structure on long-term social network dynamics in a wild mammal. *Ecology Letters*. [Online]. <u>doi.wiley.com/10.1111/ele.12447</u>

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