



Research Experiences for Undergraduates (REU) 2013

Abstract

BECKMANN, C., BLOOM, J., LAMBERT, J., WARD, R., ILANY, A. and J. JIANG. Social structure and rank predict fitness in spotted hyenas. National Institute for Mathematical and Biological Synthesis, Knoxville, TN; University of Vermont, Burlington, VT; Eastern Connecticut State University, Willimantec, CT; University of Tennessee, Knoxville, TN; Rhodes College, Memphis, TN.

Social networks are effective tools for analyzing relationships within populations. Higher connectivity between actors in the network can lead to individual benefits, such as information exchange, higher social rank, and access to resources. Spotted hyenas (*Crocuta crocuta*) live in large clans and maintain a complex social structure, making them an ideal study population when analyzing social networks. They have well-defined social ranks determined by maternal kinship. Cubs inherit social rank from their mothers, resulting in subgroups of female descendants with the same social rank, called matriline. We examined the Talek clan in Kenya's Maasai Mara National Reserve using observational data collected over a 22-year study. Our study focuses on adult female hyenas because of their dominant role in the social hierarchy. Modeling the hyena population as a social network allows us to show relationships between the connectivity, social rank, and reproductive fitness of matriline. Previous studies indicate that social rank influences fitness, but chance also plays a significant role in the success of low-ranking matriline. Our results indicate that a model including social interactions between matriline and within matriline predict fitness more accurately than a model involving rank alone. Future studies might test such a model on similarly structured species.