Progress Report for National Commission for Science, Technology, & Innovation

Project: Adolescent behavioral contributions to reproduction in female baboons.
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Progress report for research conducted in August-December 2022: Adolescent behavioral contributions to reproduction in female baboons.

Background

Adolescent female primates demonstrate a striking degree of interest in infants, pursuing social interactions and physical contact with them (Quiatt 1979). Many hypotheses have been proposed to explain adolescent female-infant interactions, with mixed support across species and contexts, and a striking lack of data on the functional consequences predicted by these hypotheses (Boose *et al*. 2018, Dunayer & Berman 2018). In addition, in humans, early life experiences are well known drivers of adolescent behavior (Bolton *et al*. 2017, Belsky 2019), but whether these patterns also occur in our closest relatives is largely unknown. In this project, Ms. Southworth tests several established and new hypotheses to explain interindividual variation in adolescent female-infant interactions in wild baboons and their functional consequences both for infants and for adolescent females.

This study is among the most comprehensive test of hypotheses explaining adolescent female interactions with infants to date, in both the number of hypotheses Ms. Southworth will be able to explicitly find support or lack of support for, and in the amount of detailed and functional data Ms. Southworth will have to test the hypotheses. This research will move the field of behavioral ecology towards a more integrative framework that incorporates early life experiences and social factors as potential drivers of interindividual variation. This work is closely related to her advisor Dr. Elizabeth Archie's ongoing research on the functional consequences of early-life adversity over an animal's lifespan.

Progress to date

From August to December of 2022, Ms. Southworth worked with the ABRP's field team to collect pilot behavioral data for this project. Her observations focused on 18 adolescent female baboons between ages 3 and 6 who had not yet conceived across three social groups in Amboseli. Ms. Southworth collected activity data for these adolescent females in continuous 30-minute focal samples each day. Focal data included all social interactions, approaches, and proximity breaks with infants under 9 months old, as well as the activities in which the focal animals were engaged (e.g., moving, resting, socializing, or feeding) and their neighbors. In total, 314 focal samples were collected for a total of 148 hours of observation.

To date, Ms. Southworth has used these pilot data to conduct preliminary analyses investigating interindividual variation in adolescent female baboons' interactions with infants. She analyzed the proportion of time focal animals spent with infants in proximity; rates of approaches to and from infants; and rates of social interactions with infants. These preliminary data reveal interindividual variation in how adolescent females spend time near and interact with infants. Indeed, for all data types, except the approach data, the standard deviation of the mean proportions or rates across all females is greater than the mean itself, indicating high levels of between-subject spread. Future mixed effects modeling will disentangle how early adversity and other covariates impact these and other metrics of adolescent female social development. These results have been presented at public scientific conferences, specifically as a podium presentation at the Center for the Integrative Study of Animal Behavior Conference and a poster at the Animal Behavior Society Conference. Ms. Southworth has also presented this research to undergraduate students in an invited lecture as part of the University of Notre Dame's Mammalogy course.

Future plans

Ms. Southworth proposes to continue her behavioral observations on the Amboseli baboons beginning in January 2024. This additional field season will significantly expand the dataset both in terms of focal individuals and in variation of potential explanatory variables of interest (e.g. experience of early life adversity, relatedness to infants, dominance rank, age). Additionally, this field season will allow Ms. Southworth to resample focal females from the original 2022 data set, enabling longitudinal analyses on the development of infant interaction behaviors. Over the 10-month study period, Ms. Southworth expects to sample approximately 30 female baboons who are at least three years old and have not yet reached their first conception for a minimum of 15 observation hours per female. Of these focal females, 13 will be older females who were previously sampled in 2022, and the remaining 17 will be younger females being sampled for the first time.

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