Play partner preferences in spotted hyenas (*Crocuta crocuta*)

Julie Javorka, Tracy Montgomery, Kay Holekamp
Michigan State University

Background

- Age 0-1 months: Cubs at natal den, where they only interact with their mother and littermate[3]
  - Intense aggression decreases and social play increases over time[1-2]
  - Both cubs initiate play, regardless of within-litter rank[1-2]
- Age 1-9 months: Cubs at communal den, where they interact with all other cubs in the clan[3]
  - No sex difference in social play[4]
  - High-ranking cubs play more than low-ranking cubs[4]

Question

What factors influence play partner preferences in spotted hyena cubs while at the communal den?

Hypothesis and predictions

- Play partner preferences at the communal den will maximize socialization benefits and minimize costs.
  - Cubs will play more frequently with unrelated individuals, since they previously played with littermates at the natal den.
  - Cubs will play more frequently with cubs of a similar age to avoid the costs of potential injury.
  - Cubs will play more frequently with cubs of the same sex, since male hyenas disperse to other clans while females are philopatric.
  - Cubs will play more frequently with cubs of ranks similar to their own, since attempts to initiate play may be less likely to elicit aggression.

Methods

- Observational data collected on three spotted hyena clans in the Maasai Mara National Reserve, Kenya from May 2015 to September 2017
- Used scan data taken every 20 minutes to determine who was playing and who was not playing
- Social play is defined as play between 2 or more individuals that is reciprocated and does not include aggression
- Mixed effects logistic regression models were fitted in R using package lme4

Results

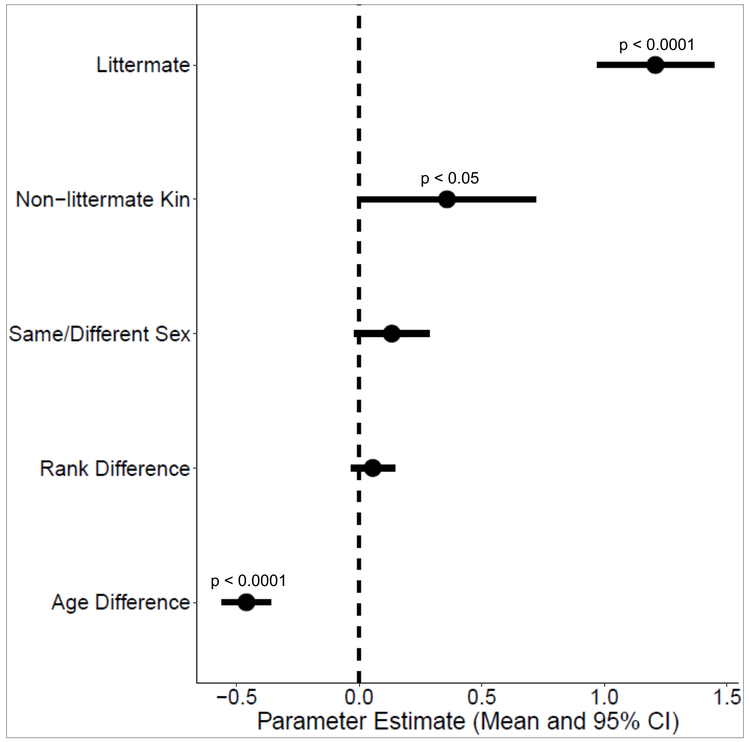


Figure 1. Parameter estimates (mean and 95% CI) of logistic mixed effects model of the probability of a dyad playing together.

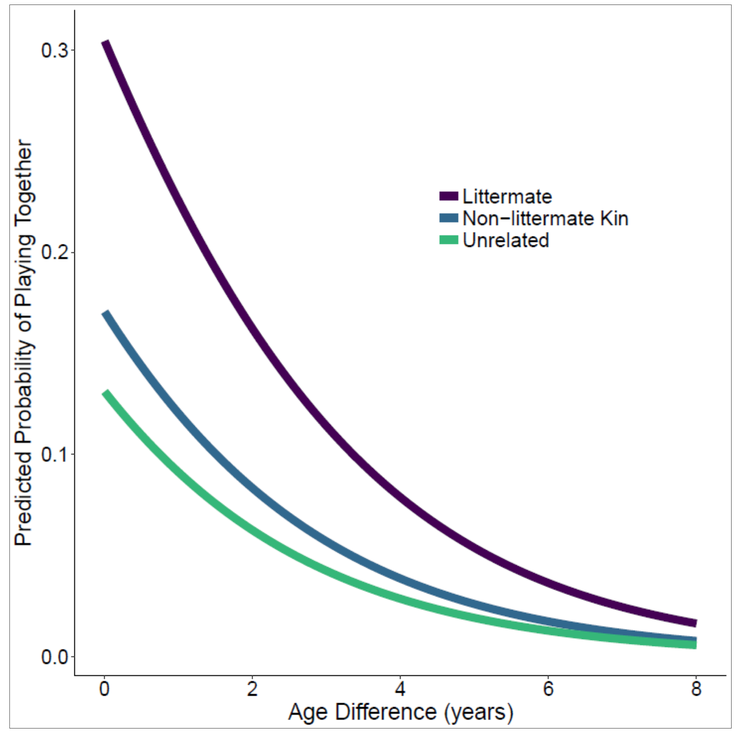
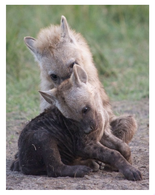


Figure 2. Predicted probability of a dyad playing together, based on relatedness and difference in age.

Discussion

- Cubs that are related are more likely to play.
  - May allow for bonding between non-littermate kin
- Cubs that are littermates are more likely to play.
  - Littermates are similar in age and size, possibly reducing the costs of play
  - Littermates receive food at the same time, and thus may have the energy to play at the same time as well
- Cubs closer in age are more likely to play.
  - Probability of injury may be reduced by choosing similarly sized partners, decreasing the cost of play
- Sex does not affect play partner choice.
  - Perhaps hyena cubs cannot discriminate between sexes until individuals get old enough to start smelling differently
- Rank does not affect play partner choice.
  - The importance of rank may depend on which cub initiates play. High ranking cubs may prefer to play with similarly ranked cubs, while low ranking cubs may prefer to play with high ranking cubs; however, we cannot test this hypothesis with this dataset.

Acknowledgements



We thank the research assistants who collected the data for the MSU Mara Hyena Project, and the MSU Honors College for their support through the Professorial Assistant program.

References

[1]Drea CM, Hawk JE, Glickman SE. 1996. Aggression decreases as play emerges in infant spotted hyenas: preparation for joining the clan. Anim Behavior 51:1323-1336.
[2]Drea CM, Hawk JE, Glickman SE. 1997. The emergence of affiliative behavior in infant spotted hyenas (*Crocuta crocuta*). Annals NY Academy of Sciences 807:498-500.
[3]Smith JE, Holekamp KE. 2010. Landmark studies: Spotted hyenas. In: Encycl Anim Behav, Elsevier: pp. 335-349.
[4]Tanner JB, Smale L, Holekamp KE. 2007. Ontogenetic variation in the play behavior of spotted hyenas. J Dev Process 2:5-30.

MICHIGAN STATE UNIVERSITY | Honors College

MICHIGAN STATE UNIVERSITY HYENA PROJECT