

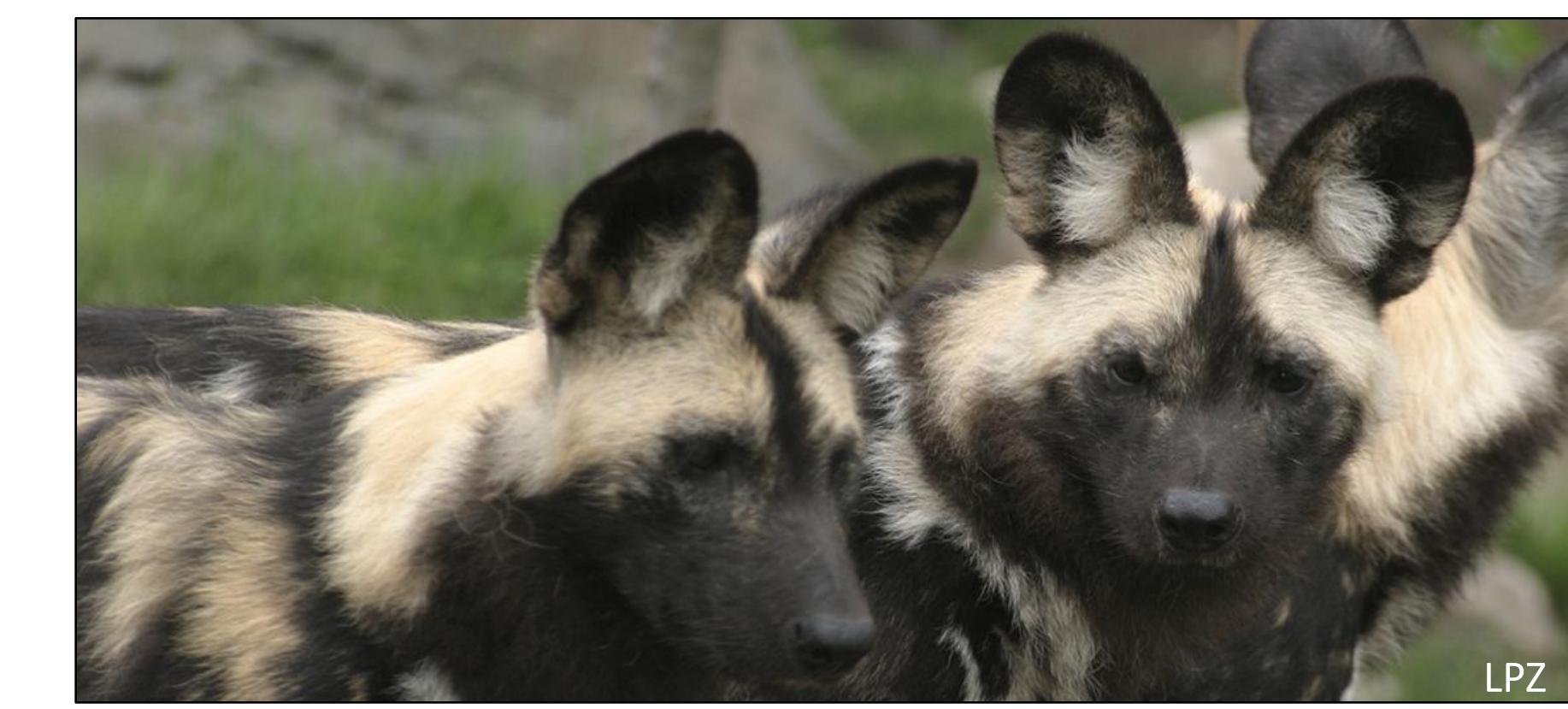
Environmental effects on behavior of African wild dogs

DEPAUL UNIVERSITY

Lincoln Park Zoo

Michael W. Wade¹ & Jason D. Wark²

1. Department of Biological Sciences, DePaul University
2. Animal Care Department, Lincoln Park Zoo

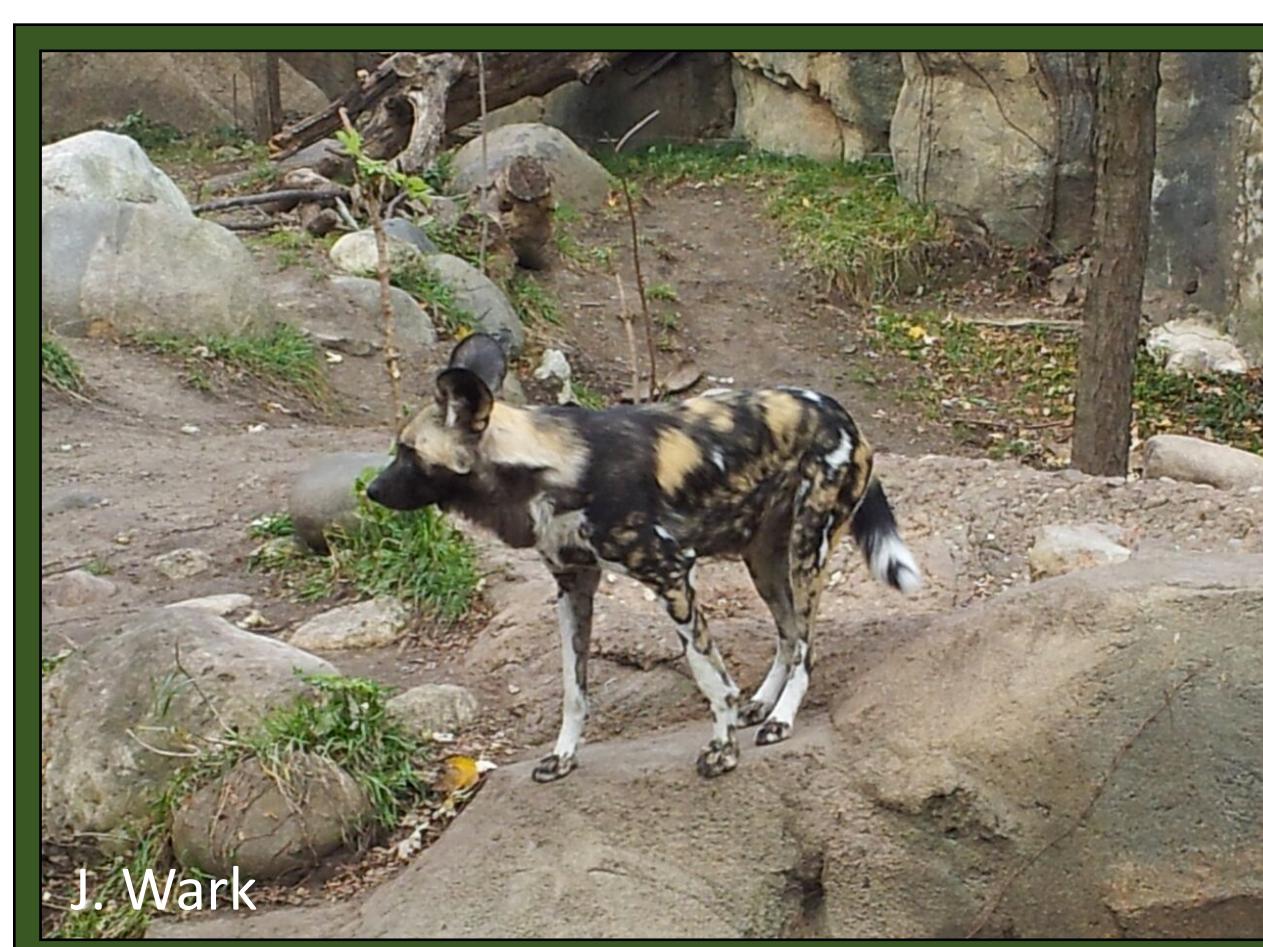


Background

- African Wild Dogs (*Lycaon pictus*) are a highly social, endangered canid species native to central and eastern Africa¹.
- Wild populations are largely diurnal, and are easily outcompeted by healthy adult lions and hyenas².
- When not searching for food or resources, individuals are primarily inactive, but consistently observe strict social hierarchies within populations³.
- For individuals in captivity, behavioral variation is an important consideration for welfare standards, and may be influenced by a number of factors, such as temperature, sound levels, crowd size, and weather.

Research Questions:

- Q1.** What environmental variables, if any, most substantially influence behavioral variation of African Wild Dogs?
Q2. Is one individual more or less prone to engage in certain behaviors than the other individual?



Lulu has darker spots and a black tail



Ola has white spots and a lighter tail

Methods

- Ten-minute observations were performed twice an hour within a six hour period over a seven day span at Lincoln Park Zoo
- Before each observation, temperature, weather, crowd size, and exhibit access data were recorded.
- During the observation, behavior & location data were recorded for each individual every 60 seconds. Additionally, sound levels were measured using the Sound Meter Pro app.
 - After the observation, mean, minimum, and maximum decibel (dB) levels were recorded.
- Behavioral richness was calculated for each observation, accounting for individual variation.
- Akaike Information Criterion (AIC) analysis was used to determine which combinations of explanatory variables best explained the observed variation in behavioral richness.

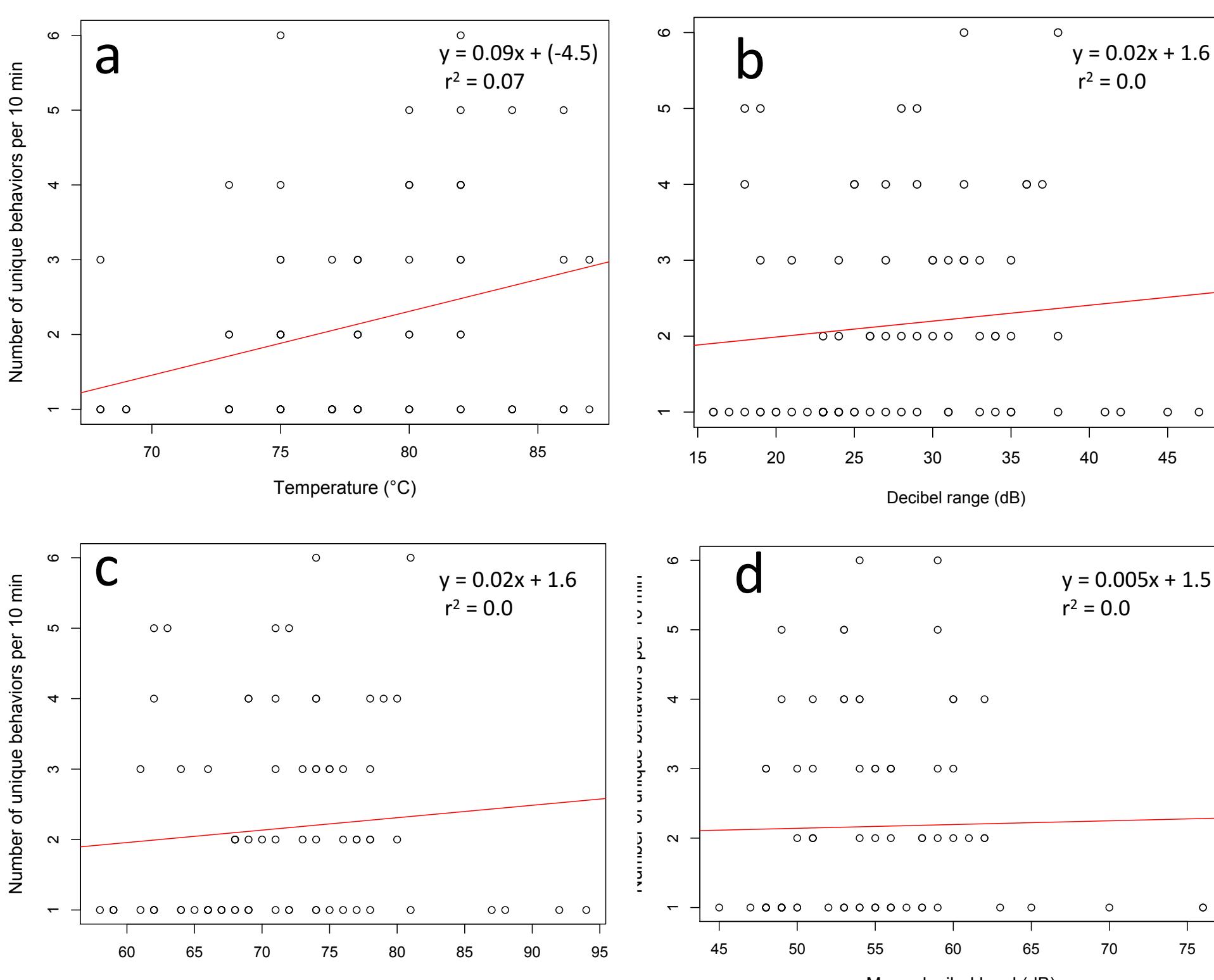
Results – Environmental Factors

- Variation in behavioral richness was best explained by the ambient temperature.
- There was a 15.1% probability that variation in behavioral richness is explained by changes in temperature alone (Table 1).

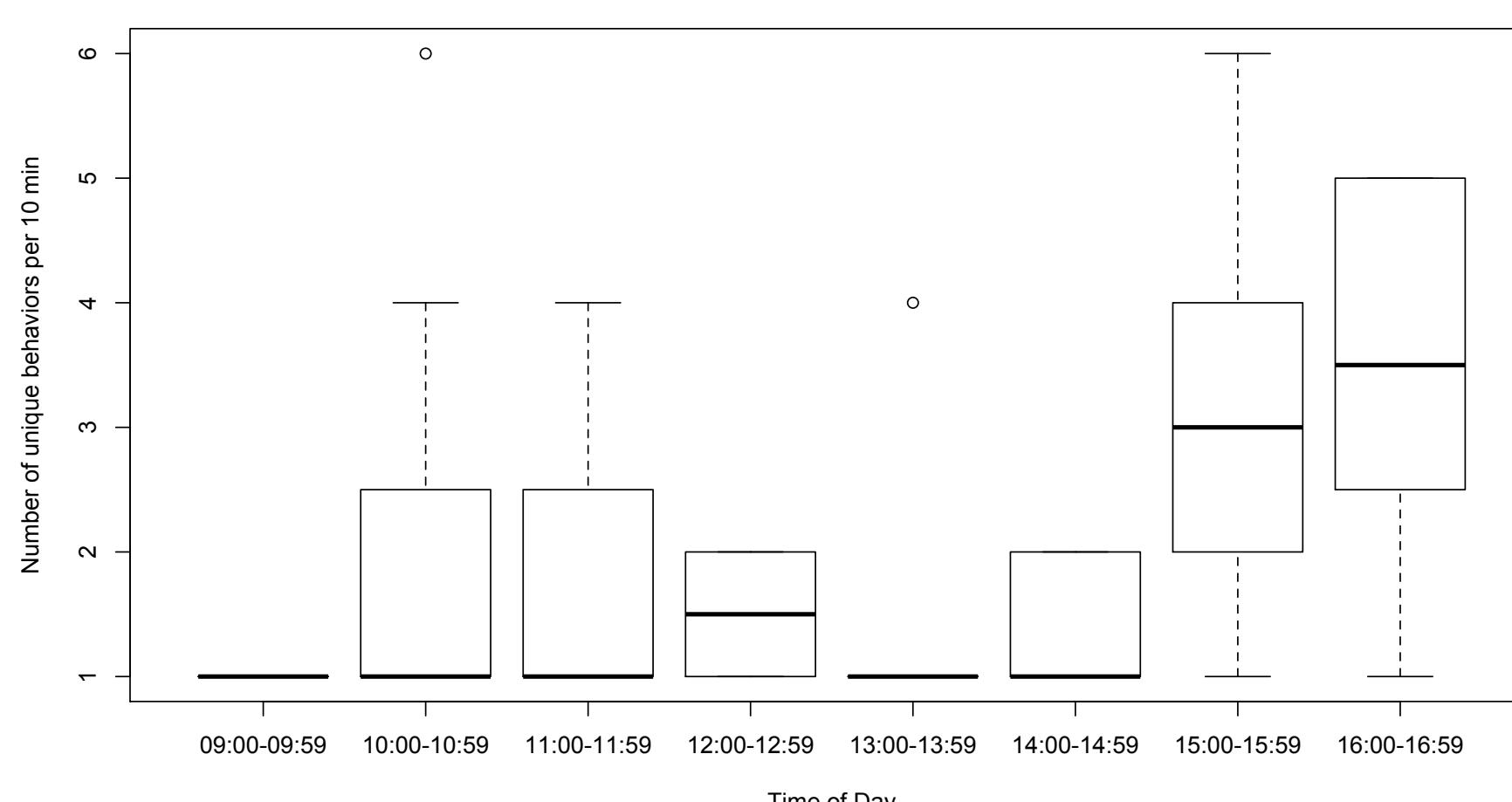
Table 1. AIC results for environmental effects on behavioral richness; top 5 models.

Model Terms	K	log lik.	ΔAICc	Weight
Temperature	3	-82.1	0	0.151
dB Range, Max. dB, Temperature	6	-79.8	0.24	0.134
Mean dB, Temperature	4	-81.2	0.53	0.116
dB Range, Mean dB, Temperature	5	-80.4	1.59	0.068
Max. dB, Temperature	4	-81.7	1.67	0.065

- Behavioral richness exhibits a positive relationship with temperature, as well as the dB range, maximum dB, and mean dB (Fig. 1)

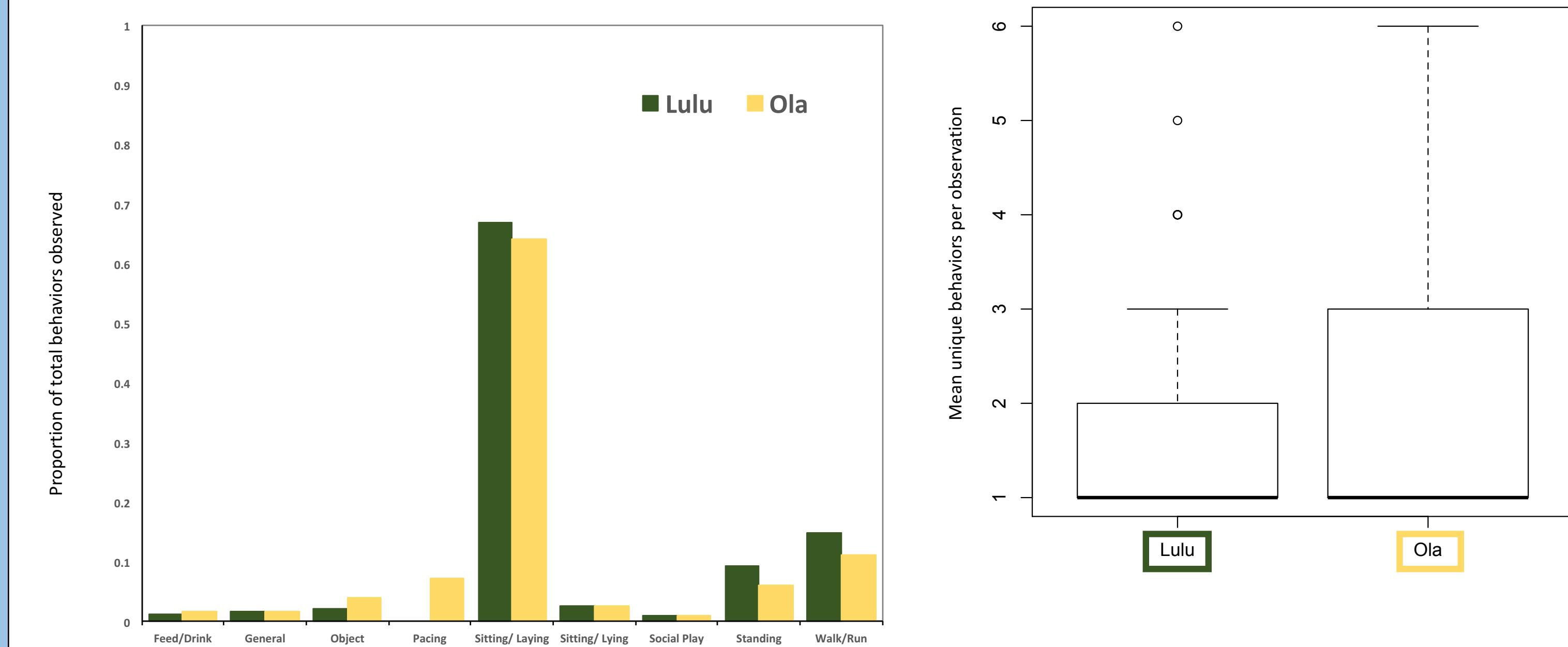


- The number of unique behaviors observed was significantly different at different times of the day (ANOVA, $F(7, 152) = 4.59$, $p = 0.0003$) (Fig. 2).



Results – Variation Between Individuals

- During observations, individuals were regularly inactive, with “sitting/lying (solitary)” behavior observed over 60% of the time during all observations for both individuals (Fig. 3).
- Ola engaged in a mean of 1.80 unique behaviors per observation, compared to Lulu's 1.78, but the difference was not significant (2-sample t-test, $t(158) = -0.11$, $p = 0.9$) (Fig. 4).



Conclusions

- Ambient temperature alone was shown to have the greatest probability of explaining behavioral variation, but not at a substantially higher likelihood than the other models
- Behavioral richness was shown to vary significantly at different times of the day, suggesting behavior is influenced by daily schedule.
- Minimal behavioral variation was observed between individuals, with the exception of pacing (a stereotypic behavior), which was only exhibited by Ola.

Acknowledgments

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