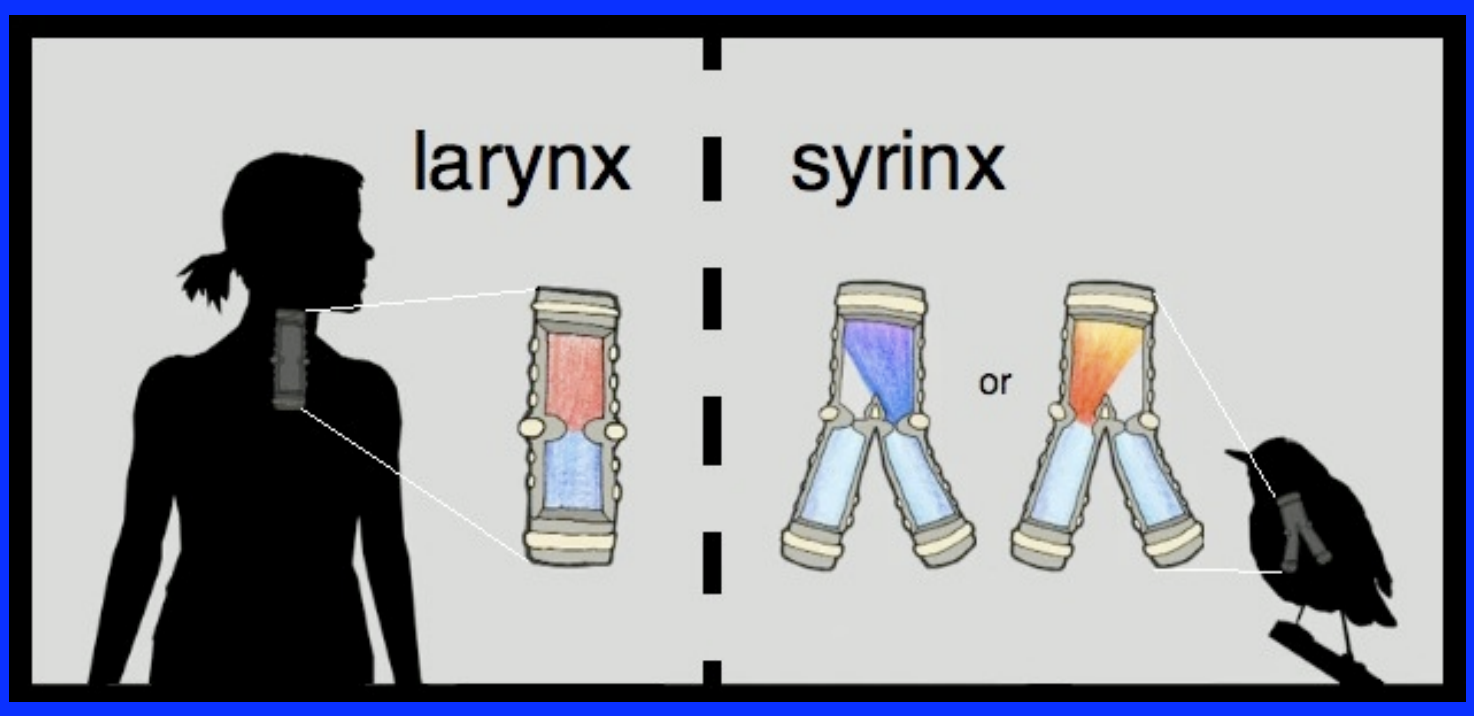
Caw of the Wild

Vocalizations of Reed College American Crows

Rachel Baden, Nathaniel Raley Bio 342

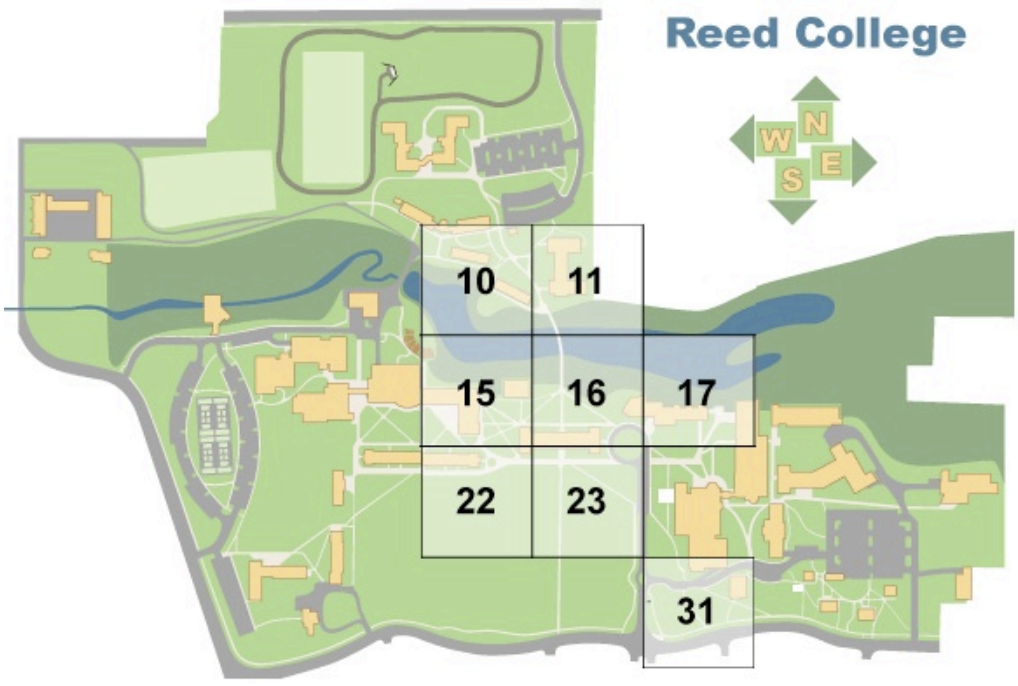
This experiment was conducted to investigate acoustic patterns in the intraspecific vocalizations of a wild population of American Crows (*Corvus brachyrhynchos*) on Reed College campus. We explored whether the environmental, social and behavioral contexts of the call had any effect on its acoustic properties.

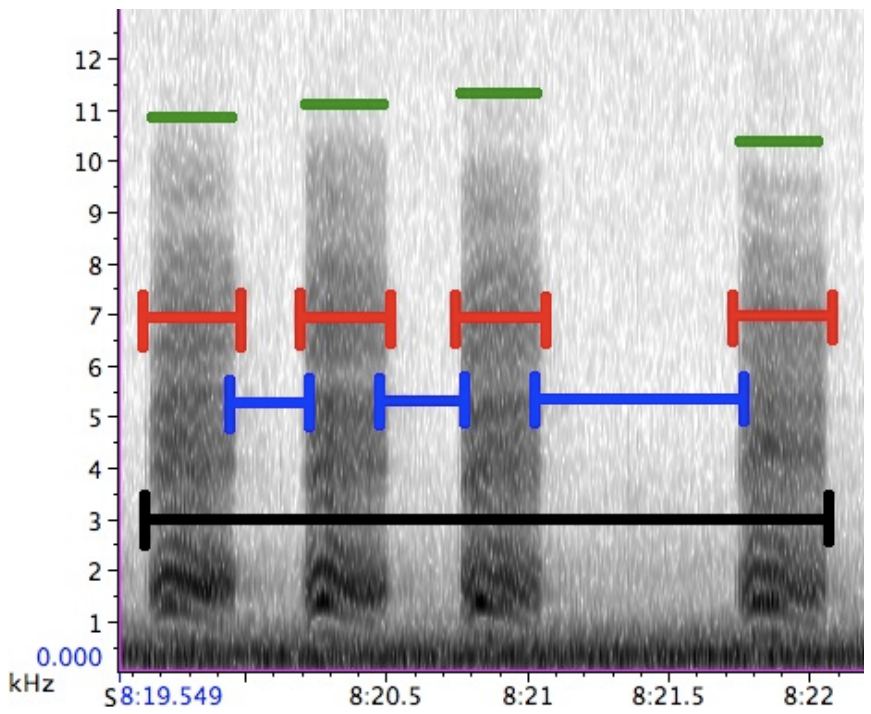
Crows are familiar over much of the continent: large, intelligent, all-black birds with hoarse, cawing voices, usually heard in unison.



Above is a comparison of the sound production systems of a human and a bird.

Experimental Design



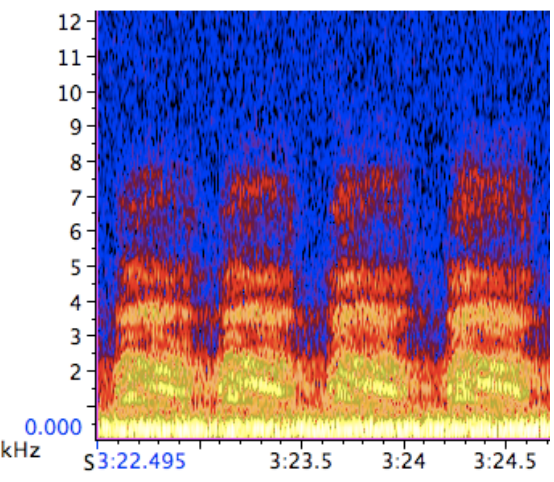


Left: map of eight sample sites. Right: illustration of acoustic variables measured (frequency, green; pulse, red; interval, blue; duration, black).

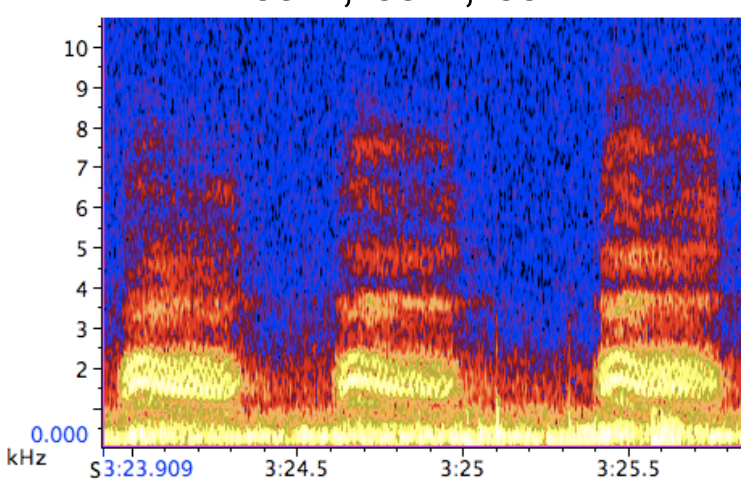
Hypothesis: The acoustic qualities of a call will vary depending on behavioral, social, and environmental context

Several hours of recording were collected using a digital audio recorder and a parabolic microphone over eight different days. Raw data yielded 188 usable crow calls which were analyzed using the free software Raven Lite. Six different acoustic properties were noted for each call (see above), in addition to contextual variables. The data showed several characteristic call patterns:

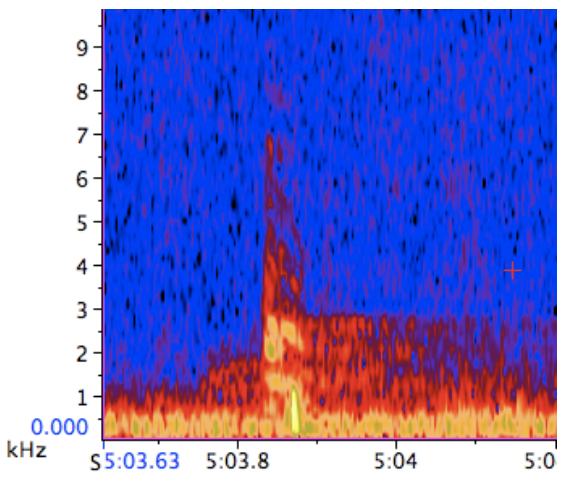
caw-caw-caw



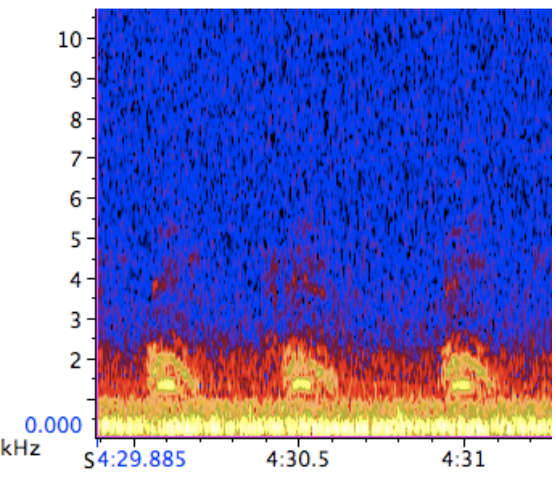
caw, caw, caw



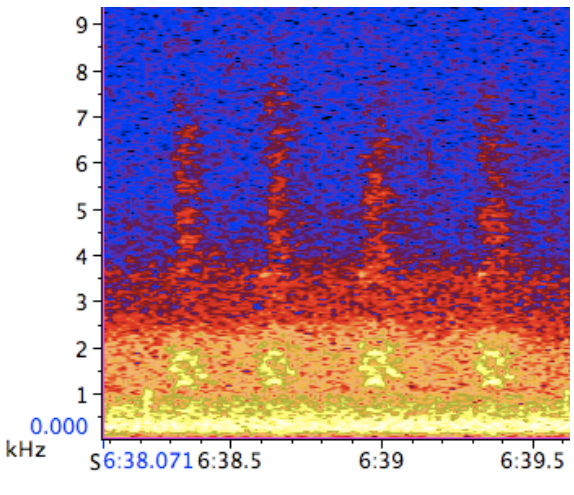
chirp



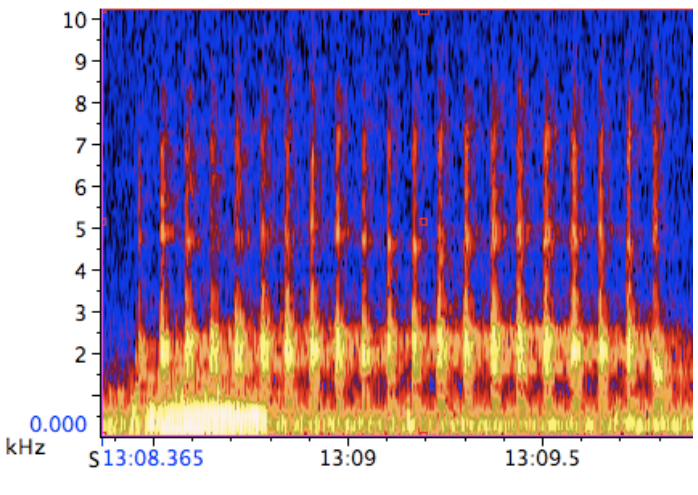
ca, ca, ca



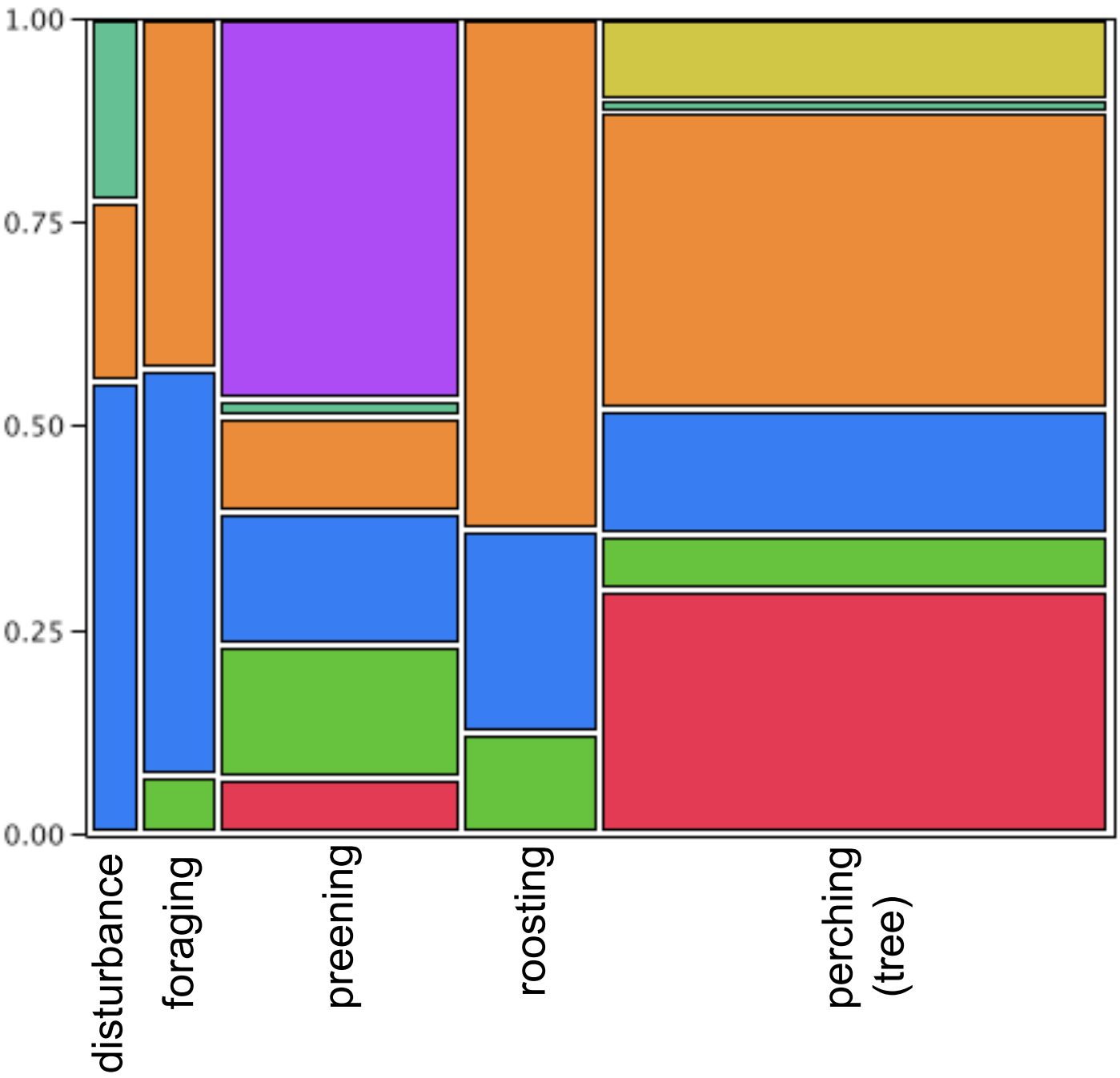
ca-ca-ca



staccato

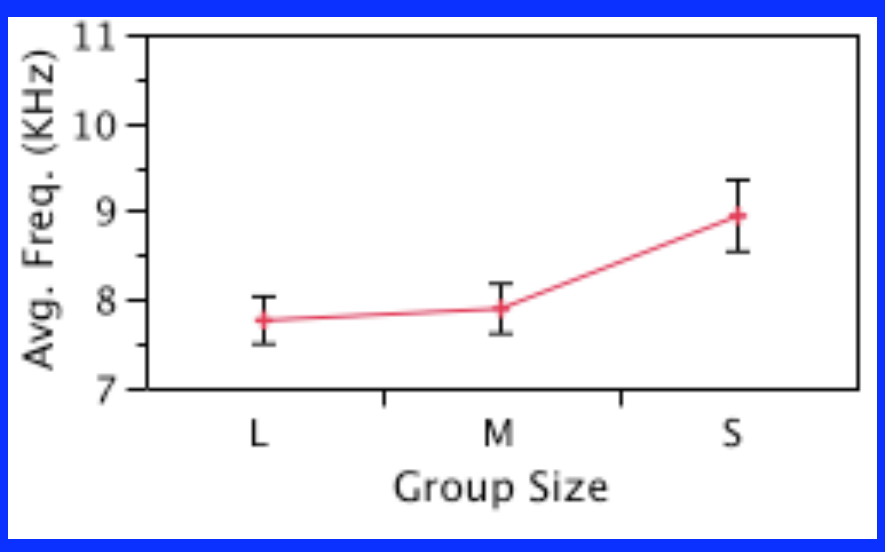


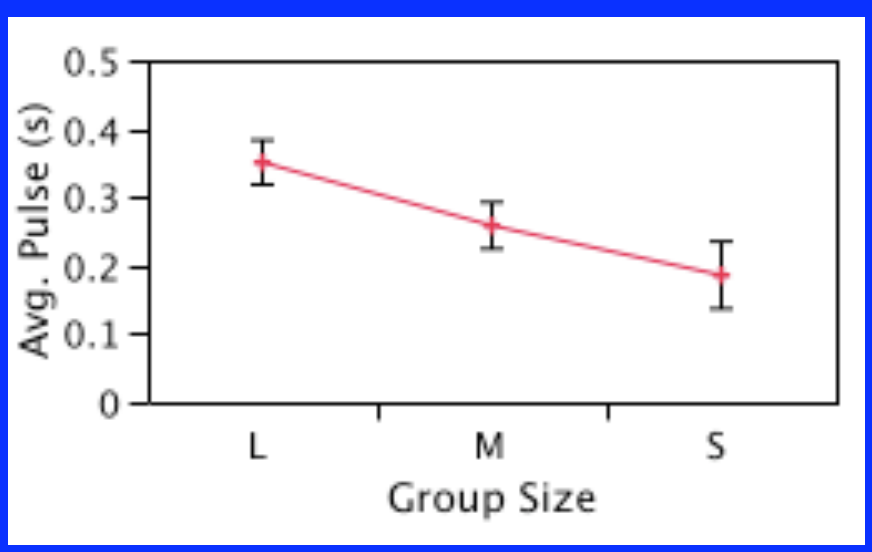
Results

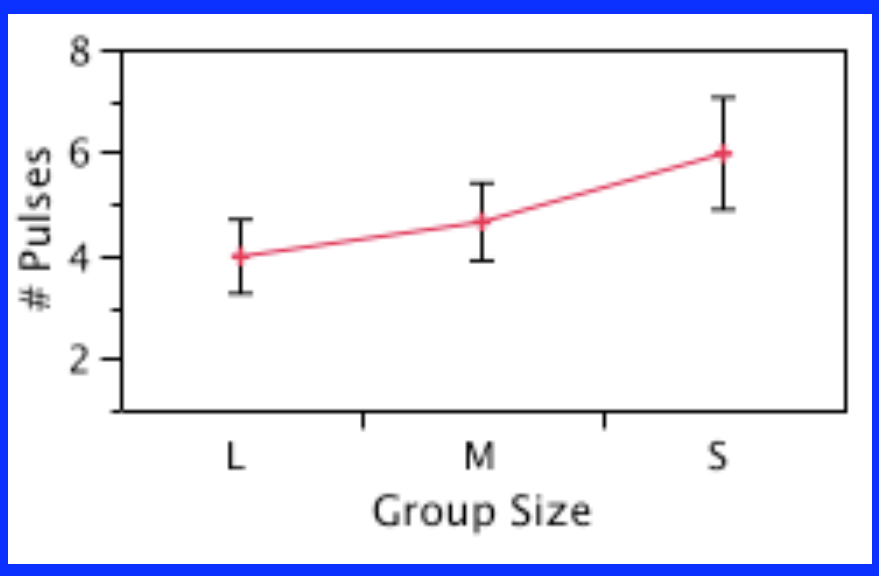


Mosaic plot of each call type made during each activity

(N=179, df 24, p<.0001, X^2 =133)







Group size was significantly correlated with average frequency ($p<0.0001$), average pulse ($p<0.0001$), and number of pulses ($p<0.0115$).

We also found correlations between the environmental factors (e.g., location, time of day), but we doubt their significance because we generally observed only one activity during any given recording session.

Conclusions

The population of Reed College crows make different calls depending on their behavior and group size

Future Directions

To more fully understand the link between vocalization and behavior, many other behavioral contexts should be considered, such as mating, nesting, feeding young, and aggression. Other environmental contexts, such as seasons, should be considered as well. A more thorough and long-term vocalization study along the same lines as this one would produce more comprehensive results.

References:

Pictures: http://commons.wikimedia.org

1. Chamberlain, D.R., and Cornwell, G.W. (1971) Selected Vocalizations of the Common Crow. The Auk. 88, 613-634
2. Marler, P., and Tamura, M. (1964) Culturally Transmitted Patterns of Vocal Behavior in Sparrows. Science. 146, 1483-1486
3. Brenowitz, E.A., Margoliash, D., and Nordeen, K.W. (1997) An Introduction to Birdsong and the Avian Song System. Journal of Neurobiology. 33, 495- 500

Acknowledgements:

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