



Endangered saiga antelope (*Saiga tatarica*) neonate vocalisation in the wild: encoding of distress, individuality and sex

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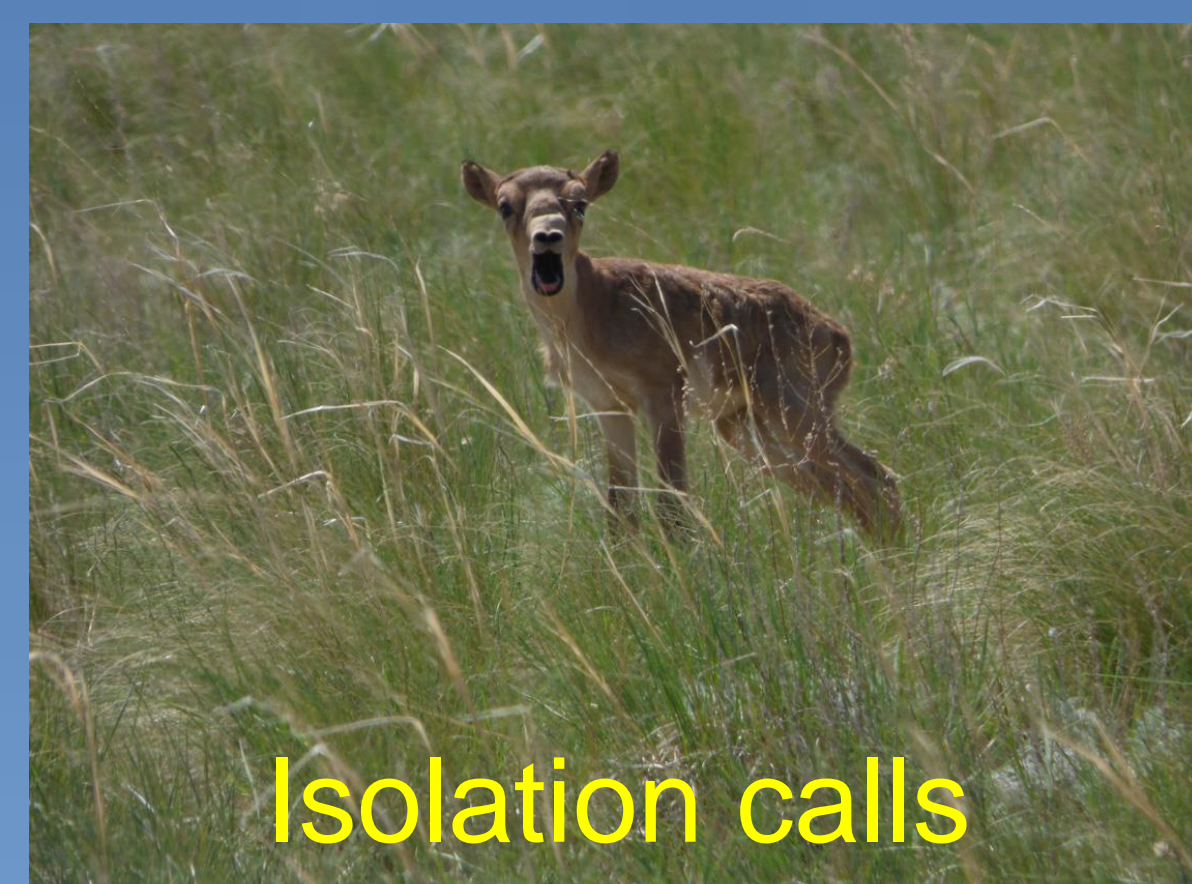
² Moscow Zoo, Russia

<http://www.bioacoustica.org>

³ IZW-Berlin, Germany

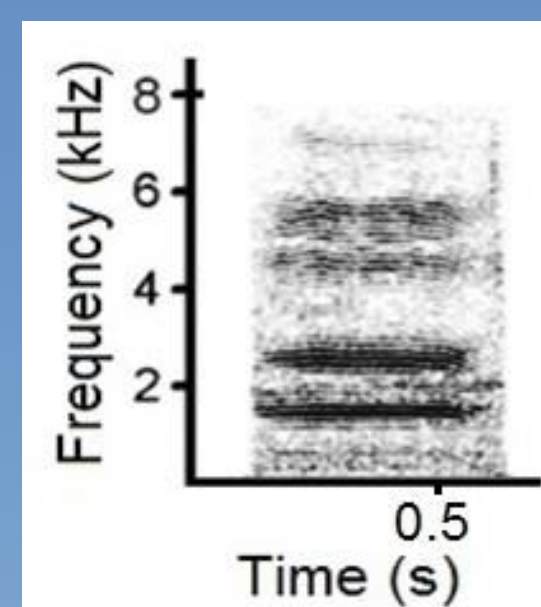
⁴ Association for the Conservation of Biodiversity of Kazakhstan (ACBK), Kazakhstan

⁵ Frankfurt Zoological Society, Germany

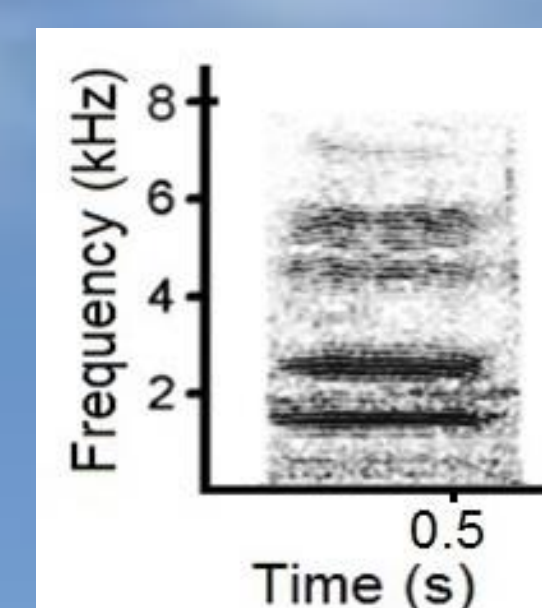


Isolation calls

when nursing by their mother is delayed



Neonate mammals often produce calls:



Capture calls

when they are captured by a predator (or humans)

Do capture calls reflect a state of higher arousal and are they less individualised than the isolation calls, as they need a more urgent response of a mother?

Materials and Methods:

Northern Kazakhstan, May 2014
1-2 day neonate saiga antelope
Open mouth calls

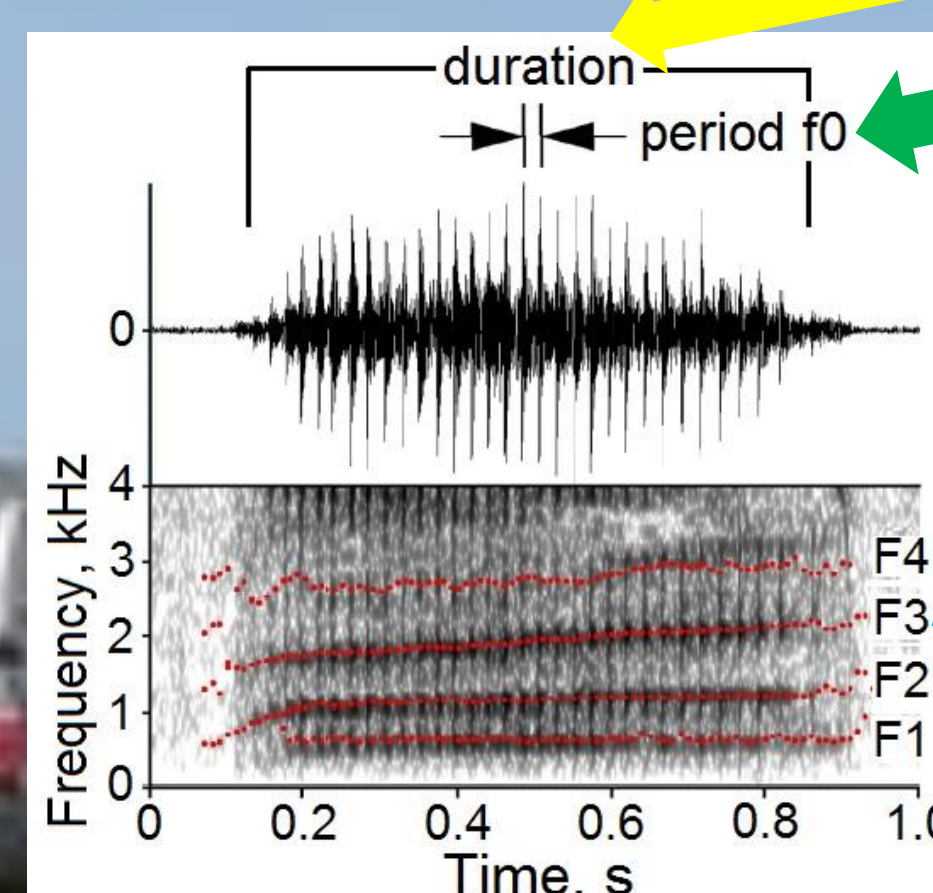


196 isolation calls of 22 neonates
Recorded by automatic recording system

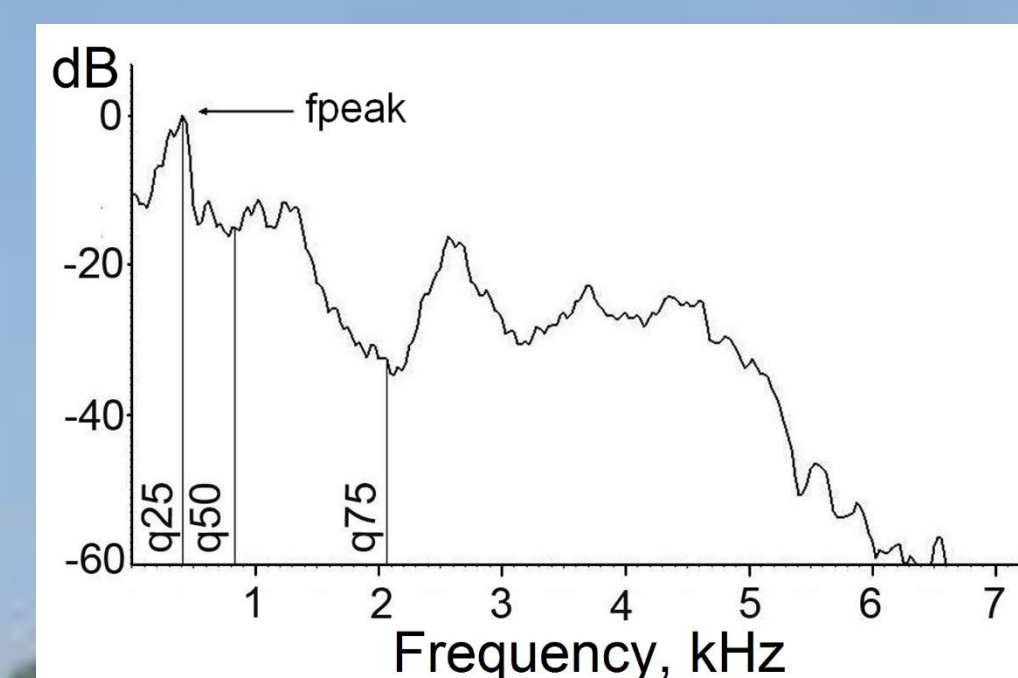


236 capture calls of 25 other neonates
Recorded manually

Acoustic analysis:



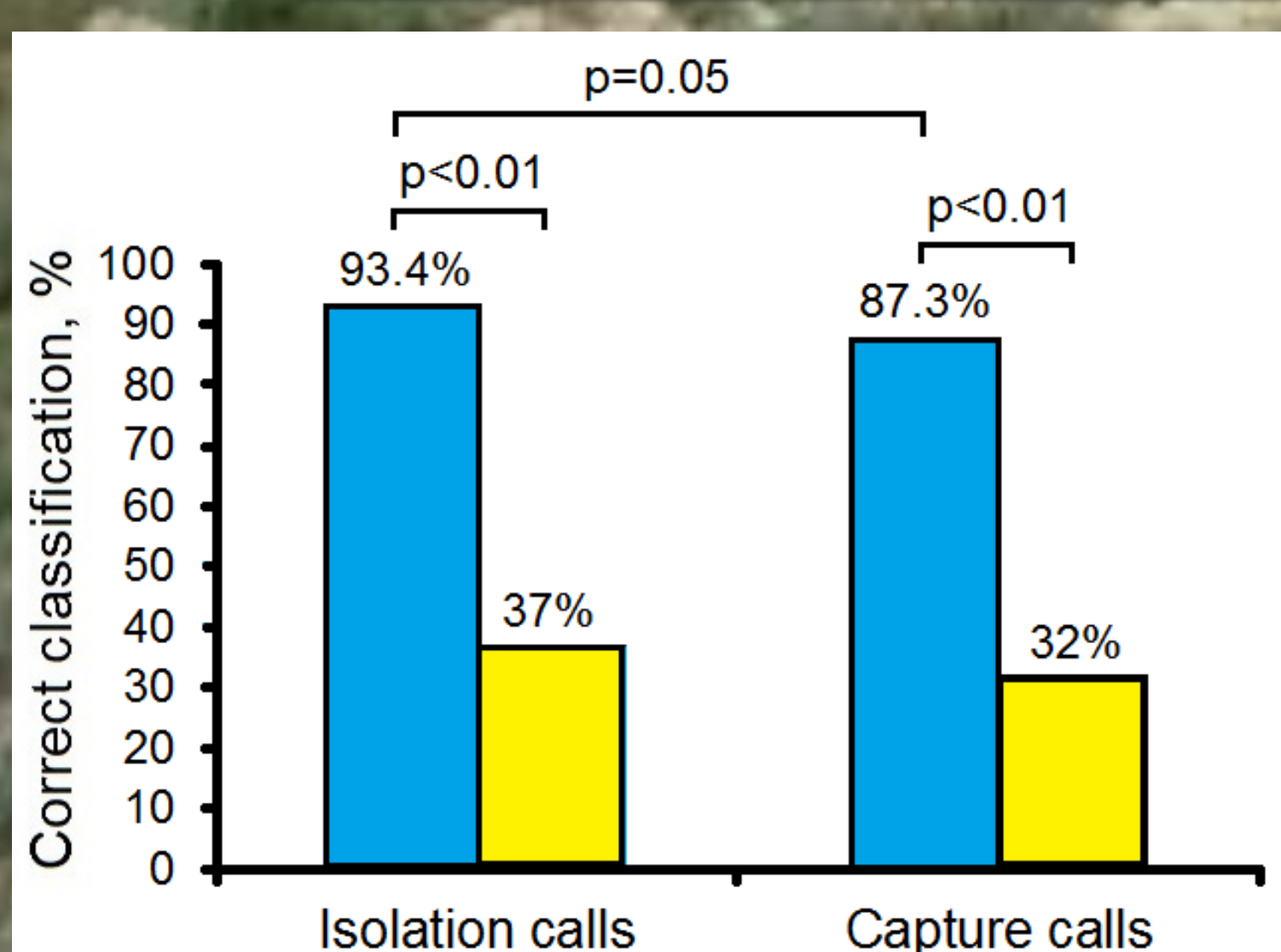
- Duration
- Fundamental frequency (f_0)
- Formant frequencies ($F1 - F4$)



- Power variables:
 - peak frequency
 - 3 quartiles

Results:

Individual vocal identity



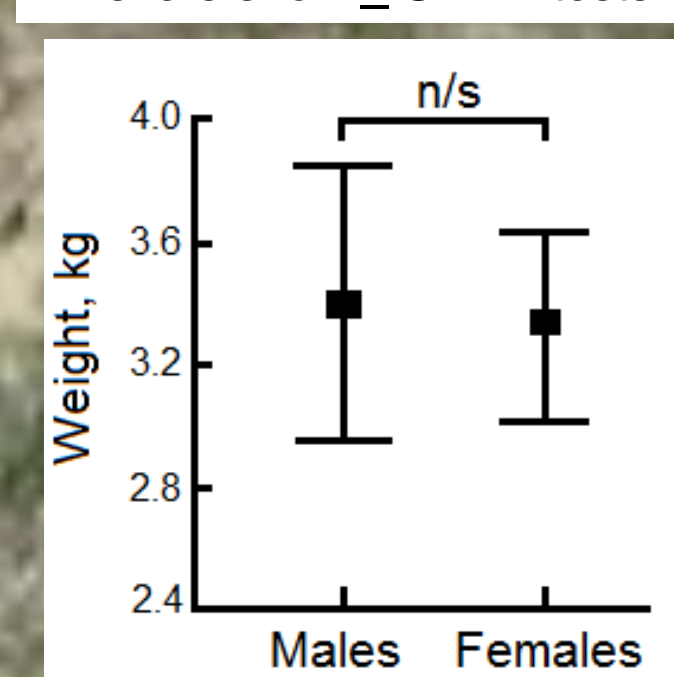
Individual discrimination based on isolation and capture open mouth calls

Blue bars indicate values of correct classification with discriminant function analysis (DFA) and yellow bars indicate random values, calculated with a randomization procedure. Comparisons between observed and random values and between isolation and capture calls with χ^2 tests are shown by brackets above.

- Neonate Saiga antelope calls have very high individuality
- As we expected, individuality of isolation calls was significantly higher than capture calls
- In both call types individuality was coded in many variables
- The fundamental frequency and 2nd and 3rd formants mainly accounted for individuality

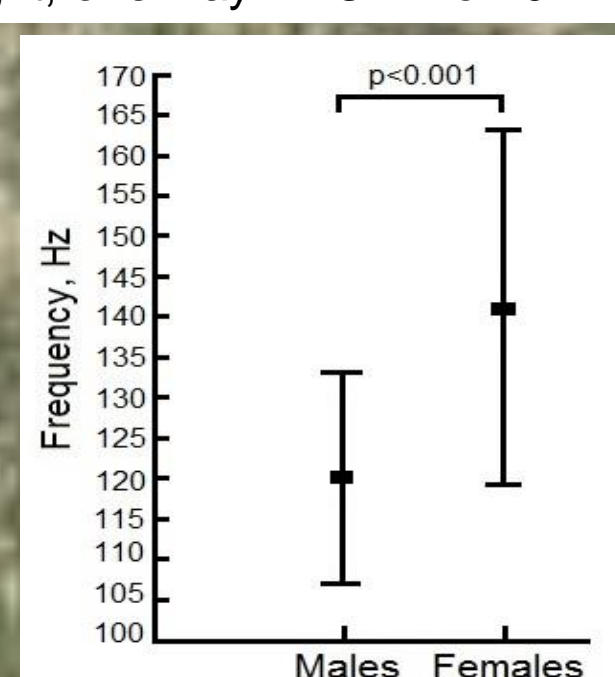
Capture calls

Comparison of weight and fundamental frequency (f_0) between males and females. Central points indicate mean values; whiskers show \pm SD. T-tests for weight, one-way ANOVA for f_0 .



Weight

No differences



Fundamental frequency

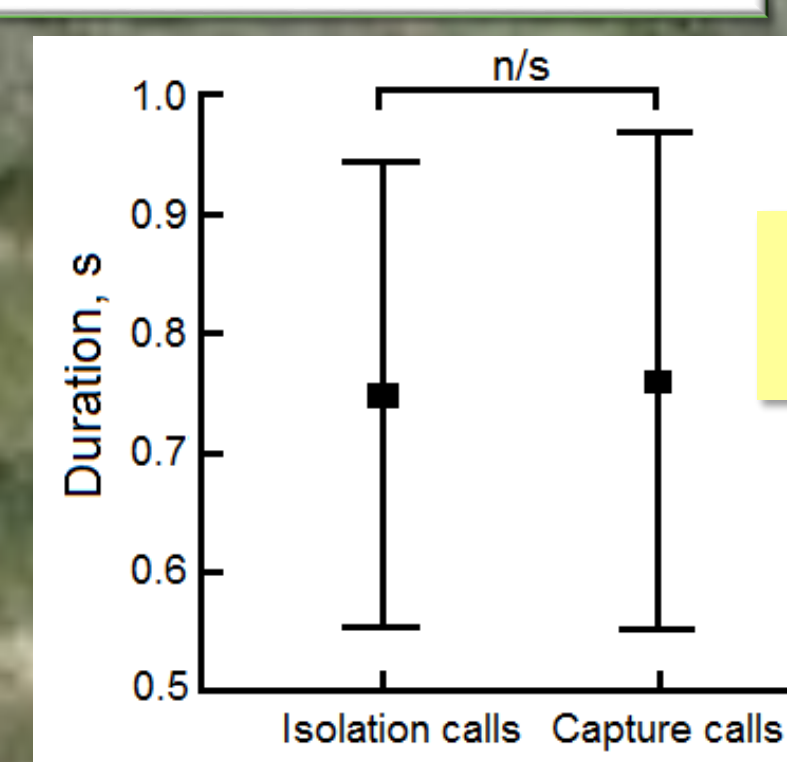
Differences

These results suggest that just after birth male have larger vocal folds (determining the fundamental frequency) than females

- Further study should investigate sex-related differences of the vocal anatomy, e. g. vocal tract based the head-and-neck photos of individual neonate saigas.

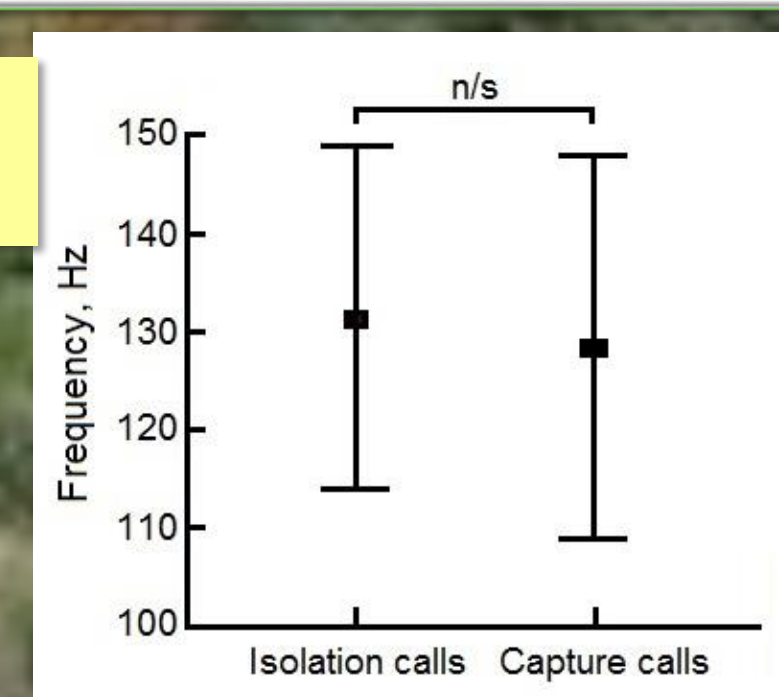
Acoustical variables

Duration

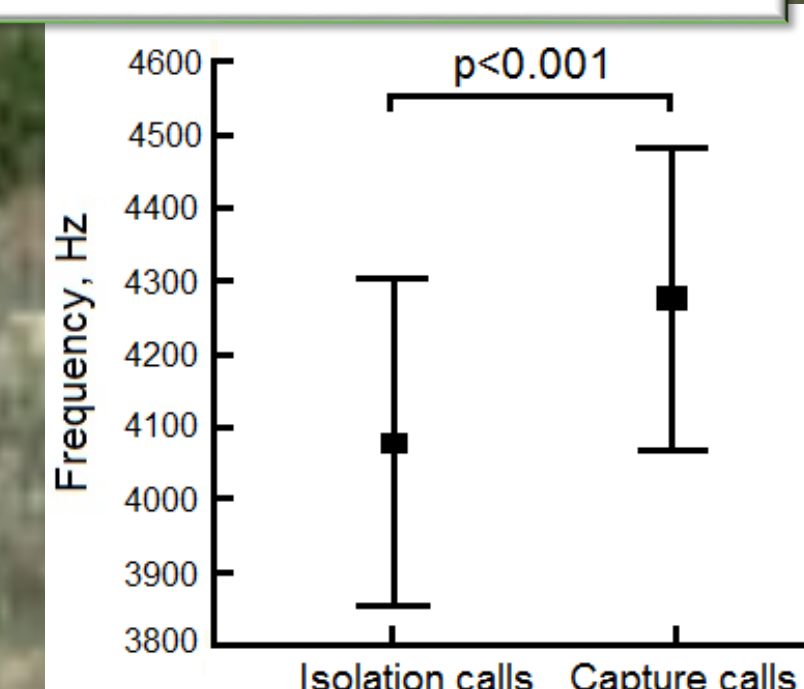


No differences

The fundamental frequency

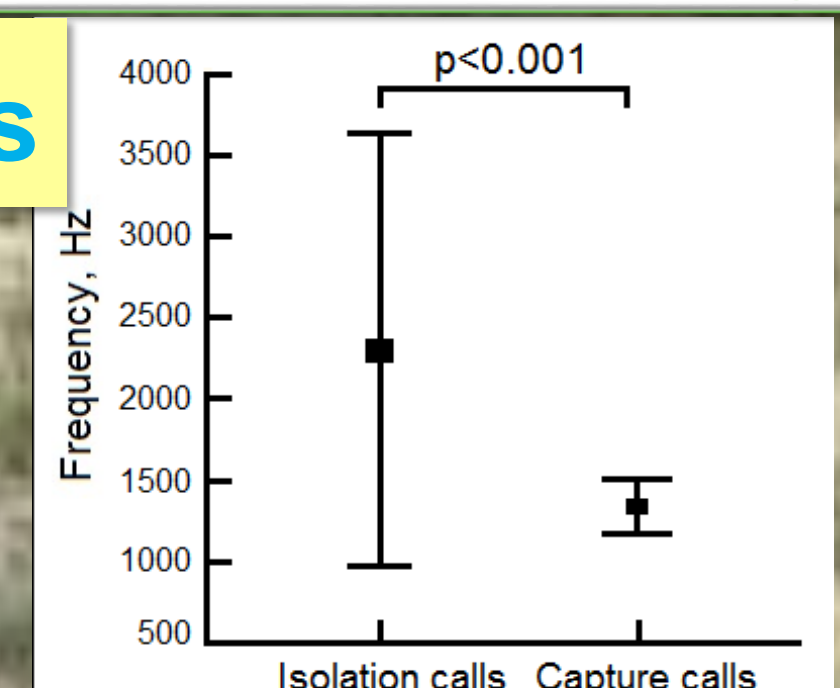


3rd formant



Differences

Peak frequency



Acoustic variables of isolation and capture calls

Central points indicate mean values; whiskers show \pm SD. T-tests.

- Isolation and capture calls have significant differences only in values of 3rd formant and power variables (peak frequency and all 3 quartiles)
- Against expectations, the peak frequency and all quartiles were higher in isolation than in capture calls

