Humans assess the emotional content of conspecific and dog vocalizations on similar acoustical base

Tamás Faragó[1,*], Attila Andics[1], Viktor Devecseri[1], Anna Kis[2, 3], Márta Gácsi[1], Ádám Miklósi[1,2]

[1]MTA-ELTE Comparative Ethology Research Group
[2]Department of Ethology, Eötvös Loránd University
[3]Research Centre for Natural Sciences, Institute of Cognitive Neuroscience and Psychology, Hungarian Academy of Sciences

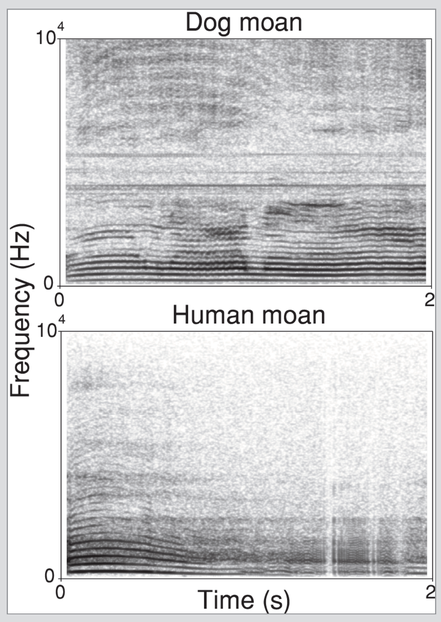
Department of Ethology

mta ttk INSTITUTE OF COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

Family Dog Project

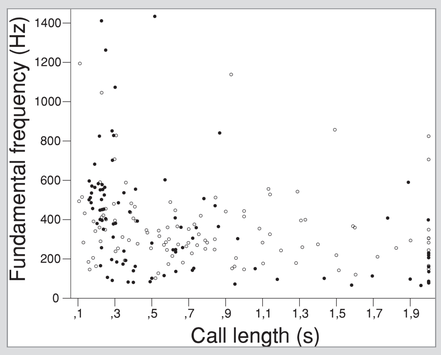
Sound samples

- 100-100 dog and human calls
- nonverbal vocalizations
- diverse social contexts



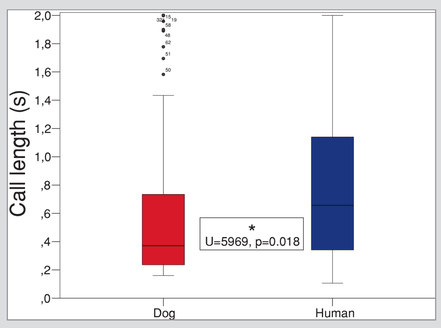
Acoustics measures

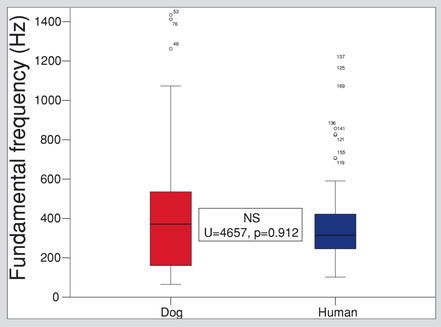
- Average Call length
- Fundamental frequency
- Harmonic-to-Noise ratio

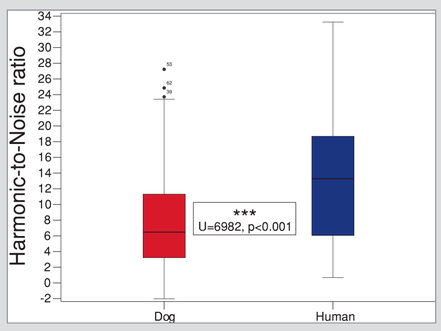


Acoustic differences

Mann-Whitney U test







Background

Emotions: specialized states of an organism, shaped by natural selection, facilitating adaptive physiological, cognitive and behavioural responses in certain contexts (1).

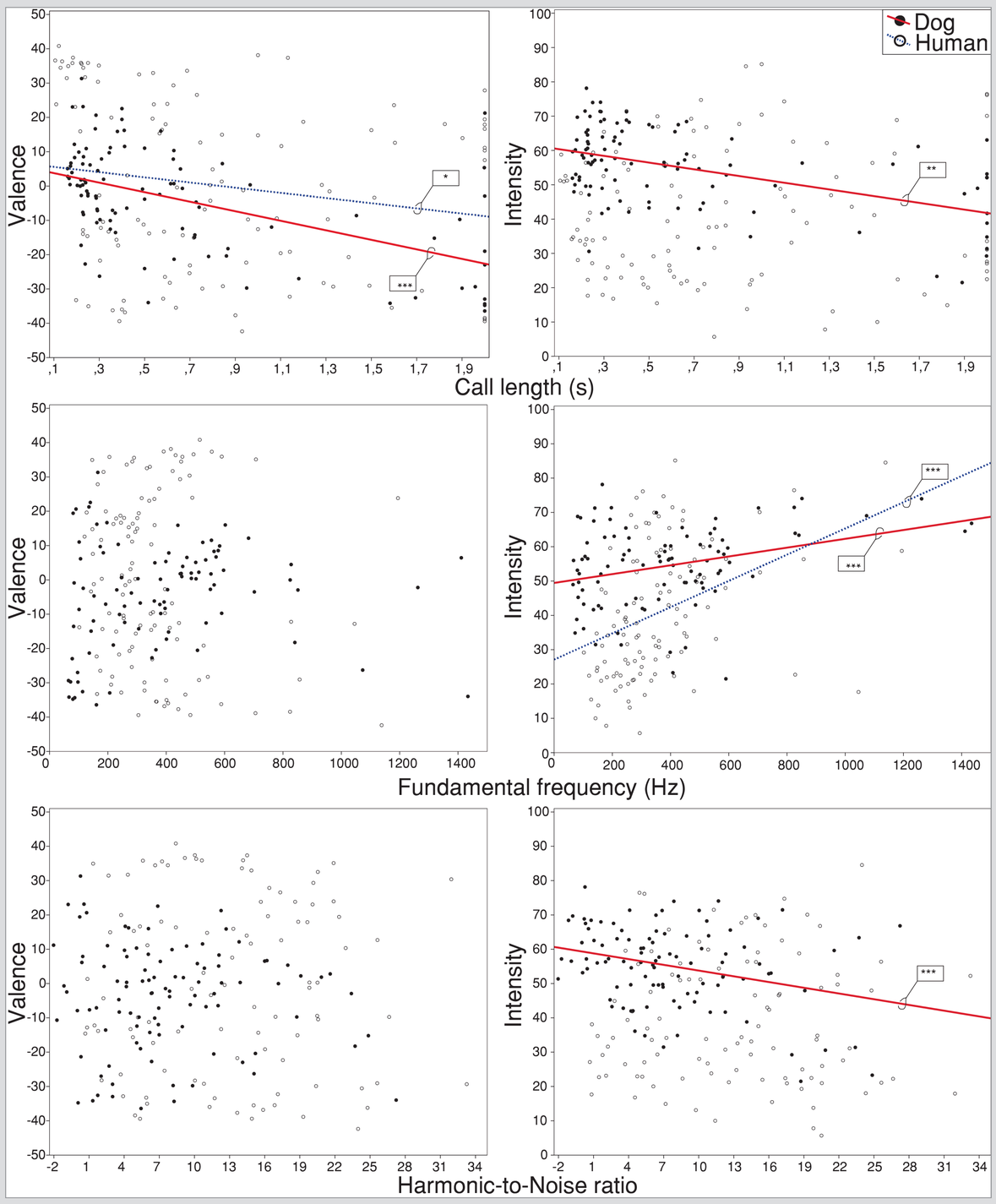
Human nonlinguistic vocal emotional expressions: ancient, evolutionarily conservative, easily recognized by others, less affected by cultural differences than linguistic emotional expressions (2).

Humans are also good at assessing the inner state of some non-human animals by their vocalizations or discriminating them by context (3).

Dogs have a special status in human society. They have a rich vocal repertoire (4) containing numerous call types which can be linked to various social contexts, their acoustical structure can reflect the possible inner state of the caller, following Morton's motivation-structural rules (5).

Little is known about how humans perceive the wide variety of dog vocalizations. Still an open question: do humans use similar features of conspecific and dog calls to assess the inner state of the caller.

Influence of acoustics on emotional ratings



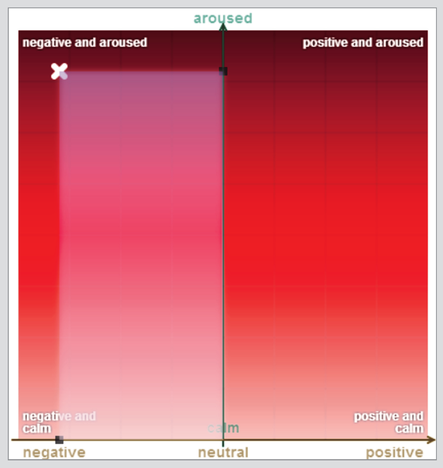
Humans use the same acoustical parameters to attribute emotional valence and intensity to both human and dog vocalizations:

Higher pitched and longer calls were rated high on intensity and negative on valence scale,and lower pitched and short calls were rated less intense and more positive.

In humans similar underlying mechanisms might be involved in the perception of human and dog vocal emotions.

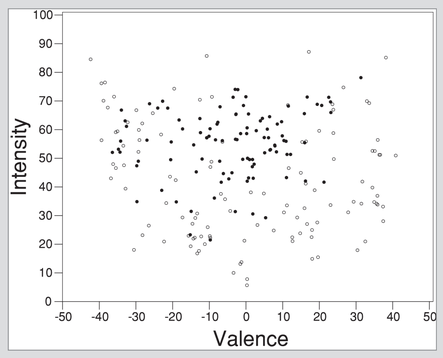
Online survey

- Based on Russel's 2D circumplex model
- Valence and Intensity scales
- Participants: 6♂ 33♀
- Mean age: 30.69±8.87



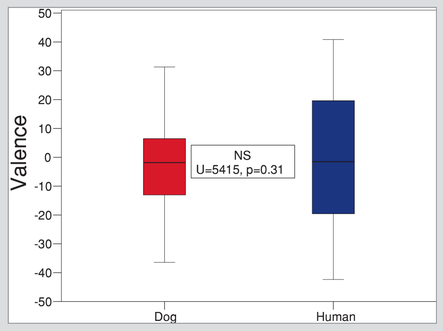
Emotion assessment

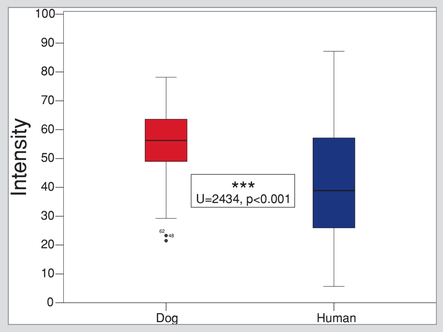
- Average Valence and Intensity scores per sample
- Responses with >11.3 s reaction time excluded

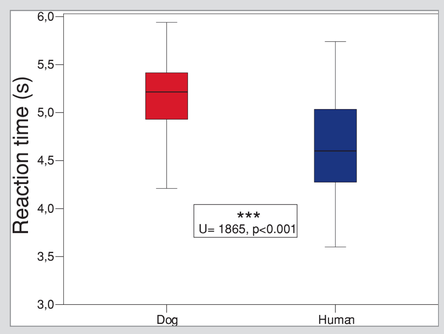


Response differences

Mann-Whitney U test







References

1. Nesse, R. M. 1990 Hum. Nat. 1, 261-289.
2. Simon-Thomas, E. R., et al. 2009 Emotion 9, 838-46.
3. Sauter, D. A., et al. 2010 Proc. Natl. Acad. Sci. U.S.A. 107, 2408-12.
4. Cohen, J. A. & Fox, M. W. 1976 . Behav. Processes 1, 77–92.
5. Morton, E. S. 1977 Am. Nat. 111, 855–869.

Acknowledgement The study was supported by The Hungarian Academy of Sciences (F01/031).