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Dogs React To Conspecific Vocalizations According To Their Basic Biological Meaning

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Due to simple general rules of acoustic valence and arousal encoding, emotion communication is possible not just within but across species too. However, less is known about the third, so called social dimension of emotion in this regard. This social dimension shows whether the adaptive reaction of listeners would be approaching or avoiding the caller.

As valence acts as an egocentric feature during communication indicating the inner state of the caller, it can be easily in conflict with the social dimension. For example, in case of agonistic calls both valence and the social dimensions are negative thus are expected to evoke withdrawal while distress calls are linked with negative inner state, but based on their function they expected to evoke an approach reaction from the conspecifics.

To test how this social dimension might work in case of dogs, in a playback study, we tested the reactions of 18 dogs to agonistic (food guarding growls) and distress (separation whines) calls. The calls were played back from a hidden speaker when the dog approached a nearby food mat ensuring that all dogs were in a given distance (approx. 2m) from the sound source, to evoke clear approach or avoidance reactions. Besides these we also coded the dogs' looking behaviour, proximity, stress indicators and owner directed behaviours.

We found that dogs that heard whines reacted more likely (binom glm, g-w: o.r.=6.25; p=0.02) and sooner (Cox reg, g-w: OR.=3.08; p=0.03) with approach, while those which heard growls reacted more likely (binom glm, g-w: OR.=0.10; p=0.01) and sooner (Cox reg, g-w: OR.=0.23; p=0.06) with withdrawal.

These results suggest that indeed, dogs reacted according to the basic biological meaning of the calls apart from the fact that both the agonistic and distress calls had negative valence.