

**Project: Acoustic cues of caller identity and affect intensity in communication calls of tree shrews (*Tupaia belangeri*)**

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Comparative studies on the vocalisation of humans and animals have shown that structural and temporal variations in communication sounds serve several functions, such as to reliably transmit the affective state and individuality of the sender. These variations within a call type are named acoustic cues and are thought to be important factors in the communication process of social living animals. In the present study, we have examined attention calls of tree shrews (*Tupaia belangeri*) for acoustic cues conveying the affective state and/or individuality of the sender. Any general physiological activation of the nervous system in a tree shrew leads to defined changes in its behavioural patterns. When aroused, it raises its tail/ruffles its tail hair and sometimes utters attention calls (von Holst, 1977). Tree shrews utter these calls in their natural habitat, when they are confronted with new environmental stimuli (Emmons, 2000).

*Experimental set-up:*

Experimental subjects were eight male tree shrews (*Tupaia belangeri*), aged from 2½ to 4 years. To evoke attention calls in the animals a disturbance paradigm was used. For an experiment a subject was removed from its respective home cage and placed in a new environment for the duration of at least 30 min. The chatter calls were recorded by a microphone and the behaviour of the subjects were videotaped simultaneously. We assumed that the excitement and therefore the affect intensity of the animals can be operationalized by the time they spent in the new environment. We supposed that the tree shrews were in a state of high affect intensity at the beginning and, because of the ongoing habituation to the new environment, in a state of low affect intensity at the end of an experiment.

*Acoustic- and video-analyses:*

To examine the attention calls for acoustic cues conveying the affective state and/or individuality of the sender, we did a multiparametric acoustic analysis. To look for acoustical variations due to the affective state of a subject, we acoustically analysed and compared attention calls from the beginning with those from the end of an experiment. To determine if the subject did indeed show a decrease of affect intensity over time, we analysed the arousal-sensitive behavioural patterns of a tree shrew during calling. Therefore, we did a frame-by-frame video analysis, using the software Interact (Mangold, Arnstorf, Germany, version 8.0.1).

*Results:*

The acoustic analysis revealed that both, the affect intensity and the individuality were expressed by temporal and structural variations within the attention calls. Thus, the present study revealed that in tree shrews, acoustic cues convey the affective state and/or individuality of the sender. Comparable variations in communication sounds transmitting the affective state as well as the identity of a sender were already be found in aggression calls of tree shrews as well as in calls of humans, non-human primates and other non-primate mammals, suggesting the existence of universal rules to convey the affective state and the individuality of the sender (Schehka et al., 2007).

*References:*

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