# People found able to recognize emotional arousal in vocalizations of land vertebrates

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Red-eyed tree frog, Osa Peninsula, Costa Rica. Credit: Charlesjsharp/Wikipedia/CC BY-SA 3.0

(Phys.org)—A team of researchers with members from Germany, France, the Netherlands and Canada has found that human beings are

able to accurately recognize emotionally based vocalizations made by a wide variety of land vertebrates. In their paper published in *Proceedings of the Royal Society B*, the team describes experiments they conducted with volunteers listening to recorded animal sounds and what they learned by doing so.

In addition to our spoken language, humans also utter a variety of sounds that reveal our emotional state—sounds such as moans of pleasure during sex, frightened screams or even angry growls. Scientists have noted that other animals make sounds that correlate to their emotional states, as well. In this new effort, the researchers sought to learn whether human beings are able to recognize which sort of emotional state other animals are experiencing based only on the sounds they emit.

In the experiment, volunteers listened to prerecorded animal sounds and attempted to identify the emotional state of the creature that made it. To rule out the possibility that some sounds might be more or less recognizable by people who speak different languages, the volunteer group included people who spoke German, English or Mandarin. In all, the researchers played 180 vocalizations for the volunteers representing a very diverse group: black-capped chickadee, hourglass treefrog, American alligator, common raven, giant panda, barbary macaque and the African bush elephant. The researchers also carried out an acoustic analysis of the sounds on the recordings, comparing the sounds with people's reactions to them and found that humans use many acoustic clues to understand emotional noises made by other animals.

The researchers report that the volunteers were quite accurate in their ability to distinguish animal emotional vocalizations, showing an ability to distinguish between such sounds as cries of pain, exhilaration or fear in all of the land animals—regardless of which language the people spoke.

This finding, the researchers suggest, hints at the possibility of common ancestral roots that evolved as a means of survival—being able to recognize the sounds other animals make when threatened, for example, could help humans prepare for what lies ahead.

**More information:** Humans recognize emotional arousal in vocalizations across all classes of terrestrial vertebrates: evidence for acoustic universals, *Proceedings of the Royal Society B* (2017). rspb.royalsocietypublishing.or … .1098/rspb.2017.0990

**Abstract**
Writing over a century ago, Darwin hypothesized that vocal expression of emotion dates back to our earliest terrestrial ancestors. If this hypothesis is true, we should expect to find cross-species acoustic universals in emotional vocalizations. Studies suggest that acoustic attributes of aroused vocalizations are shared across many mammalian species, and that humans can use these attributes to infer emotional content. But do these acoustic attributes extend to non-mammalian vertebrates? In this study, we asked human participants to judge the emotional content of vocalizations of nine vertebrate species representing three different biological classes—Amphibia, Reptilia (non-aves and aves) and Mammalia. We found that humans are able to identify higher levels of arousal in vocalizations across all species. This result was consistent across different language groups (English, German and Mandarin native speakers), suggesting that this ability is biologically rooted in humans. Our findings indicate that humans use multiple acoustic parameters to infer relative arousal in vocalizations for each species, but mainly rely on fundamental frequency and spectral centre of gravity to identify higher arousal vocalizations across species. These results suggest that fundamental mechanisms of vocal emotional expression are shared among vertebrates and could represent a homologous signalling system.