

ATTILA ANDICS, PhD VOCAL SOCIAL PROCESSING ACROSS SPECIES: COMPARATIVE fMRI STUDIES IN DOGS AND HUMANS

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To better understand the evolution of the neural capacities for processing communication signals in mammals, our group aims at exploring how the brains of different species analyse vocal and social cues from their conspecifics and other, phylogenetically distant but socially close species. Dogs present an ideal case for such investigations. An in-house developed training method enables us to run fMRI studies in awake, unrestrained, cooperating dogs. In the first dog-human comparative brain imaging study we found that voice areas preferring conspecific vocalizations exist not only in primates, but also in dogs, and that basic biological meaning in vocal signals are processed species-independently (Andics et al., 2014). In another study on how dogs process human words (Andics et al., 2016), we showed that dog brains, just like human brains, can separately analyse and also combine lexical and intonational cues: what we say and how we say it. Our recent findings follow up on these basic results, revealing a human-analogue speech processing hierarchy, the modulatory role of who speaks to whom, and parallels between within- and across-species voice and face processing. These findings show that awake dog brain imaging may open up new horizons for comparative mammalian social neuroscience, and may help to gain insights for how language evolved. In the talk I present our latest findings, method developments and promising future directions in this research, and also some technical challenges central to dog fMRI, with possible solutions.

Attila Andics has obtained master's degrees in cognitive neuroscience, psychology, mathematics and teaching, and a PhD in psycholinguistics and functional brain imaging in the Max Planck Institute for Psycholinguistics and the Donders Centre for Cognitive Neuroimaging, in Nijmegen, the Netherlands.

He has joined the Ethology Department of Eötvös Loránd University in Budapest in 2012. He has been working with fMRI for fifteen years, examining the neural mechanisms of voice and speech processing in humans and dogs. He has played a central role in the developments of comparative dog-human fMRI, designed brain imaging protocols and nonstandard fMRI data analyses for dogs, and published among others in *Science*, *Current Biology*, *Trends in Neuroscience and Neuroimaging*. His and colleagues' findings on dog voice areas and the neural similarities of dog and human vocal emotion processing were selected among the 10 most important scientific news of 2014 by fellow scientists, according to *Guardian*. Their findings on dogs' speech processing capacities were among the 10 most reviewed research news of 2016, according to *EurekAlert*. He has given educational courses on presentational skills and scientific video abstract creation, and features on documentaries on BBC, ZDF, Discovery Channel and Animal Planet. In 2017 he was awarded the Hungarian Academy's prestigious 'Lendület' grant to establish his own research group on comparative mammalian social neuroscience and study the neuroethology of communication in multiple species.