

## **10: Evolution of Nonverbal Communication: Music and the Voice**

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**Involved disciplines/subjects:** Cognitive Neuroscience, Communication, Genetics, Linguistics, Psychology

**Number of positions requested:** 1

### **Abstract:**

Linguistic evolution is a prime topic for the IMPRS, but the human voice can also be used for communicating nonverbal social signals, by spontaneously using prosody and intonation. The topic of this project is to investigate the degree to which (different aspects of) the human voice and music have evolved in parallel, and today are mediated by common brain mechanisms. Findings that individuals with congenital amusia have (slightly) reduced abilities in emotion perception from the voice, and that speaker identification from the voice can benefit both from musical training and from speaking a tonal language, suggest that cultural training may enhance human capacities to retrieve social cues from voices. Here we plan to study the recognition of kinship (genetic relationship), which has never been investigated for human voices. We consider this approach relevant and promising, because a recent study with old world primates (mandrills) has suggested efficient kin recognition from vocalisations, and because human kinship recognition from faces is well demonstrated. This project will build both on our methodological expertise in voice research, and on recent evidence of common perceptual recalibration mechanisms for the perception of timbre in human voices and music. The successful candidate will investigate (1) the degree to which voices support kinship recognition, the ability of listeners (from the same or different cultural background/language as the speakers) to determine whether or not two unfamiliar voices are from direct relatives. German will be compared with a tonal language (Chinese). S/he will also (2) study musically skilled and unskilled listeners, to determine the degree to which musical skills can be beneficial to vocal kinship recognition. S/he will (3) perform acoustic analyses to determine the cues that mediate vocal kinship recognition, and (4) perform an exploratory EEG study to search for cortical correlates of auditory kinship recognition. The project reflects an interdisciplinary effort (involving cognitive science, linguistics, psychology and neuroscience). It complements research on linguistic evolution by focusing on an important but

neglected aspect of nonverbal auditory communication, and its relationship and co-evolution with music.

Successful applicants should hold (by the time of appointment) an excellent masters degree in linguistics, psychology, cognitive science, neuroscience, or related disciplines, and bring both expertise in experimental design/data analysis and enthusiasm for voice and music research towards uncovering the evolutionary bases of nonverbal auditory communication.

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- 4 Dal Martello, M. F. & Maloney, L. T. Lateralization of kin recognition signals in the human face. *Journal of Vision* **10**, doi:10.1167/10.8.9 (2010).
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- 9 Piazza, E. A., Theunissen, F. E., Wessel, D. & Whitney, D. Rapid Adaptation to the Timbre of Natural Sounds. *Scientific Reports* **8**, doi:10.1038/s41598-018-32018-9 (2018).