

Ontological description of vocal production in world's music cultures – a physiological approach

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We present our investigative study into vocal production ontology intended for comparative cross-cultural analysis of singing style. Such an ontology should provide a baseline vocabulary to explicitly define and compare vocal production, helping to formalise the discourse on vocal quality and singing style within and across disciplines, including ethnomusicology, voice science, singing education and music informatics. Our study examines the viability of using physiological and functional descriptors for modelling of vocal production.

Vocal quality is usually described in subjective, perceptual terms such as bright or dark sound, metallic, heavy, brassy, lyrical or round. These descriptions are not only tradition specific, but more often than not they are highly subjective. While many disciplines have approached vocal production (Johan Sundberg in voice science, Jo Estill in singing education, Alan Lomax in ethnomusicology), these approaches still have limited, discipline specific applications and some of them display methodological weaknesses.

Our study is based on interviews with 13 world-class experts in vocal physiology - otolaryngologists, speech language therapists, singing teachers. They performed perceptual and physiological analysis of 19 singing fragments from 11 cultures. Physiological analysis was conducted using our preliminary ontology of vocal production based on state of the art concepts in voice science and singing education. The aim of our study is to verify the consistency of experts' ratings and the inter-rater agreement, a strong agreement indicating a general validity of physiological approach.

Our study design combines quantitative and qualitative research methods. We present the results obtained through a detailed statistical analysis of inter-participant agreement, triangulated via qualitative analysis of the interviews. We also examine the relationship between experts' perceptual and physiological ratings. We discuss the implications of our results for further ontological work in the field of vocal production.