

ATYPICAL CALLS IN CAPTIVE ORANGUTANS (*PONGO SP.*): THE DAWN OF AN OPEN-ENDED ACOUSTIC REPERTOIRE

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After centuries of research the evolutionary puzzle of human language remains unbind. One of the central pieces of the puzzle concerns the apparent discontinuities between the open-ended (limitless) acoustic repertoire of humans and that of our closest relatives. The question persists; do great apes have the precise motor control and flexibility over oro-laryngeal structures and breathing which bring about the ability to innovate and/or socially learn new acoustic signals? This ability would permit an organism to increase its call repertoire considerably beyond that which is acquired genetically and offer selective advantages by allowing the transmission of non-emotionally-driven information. Here, we show case studies of several orangutan species-atypical calls produced by captive individuals, putatively learned spontaneously or after training. Acoustic analyses confirm that these calls represent distinct types from those produced by wild orangutans (from a database comprising more than 5000 recordings) and captive orangutans in different facilities, hence that these calls were strongly likely learned. At the same time, spectrographic and video examination of these atypical calls indicate that orangutans have some degree of motor control over three major components of call production: breathing, oral (supra-laryngeal) structures and, tentatively, laryngeal structures (namely the vocal folds, although these may not be strictly necessary for the production of new atypical calls). Altogether, these data suggests that the degree of motor control over these components in orangutans is sufficient to allow the acquisition of new (acoustically varied) atypical calls, via innovation or social learning, and increase their call repertoire.

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