Exploring Vowel Production Strategies from Infant to Adult by Means of Articulatory Inversion of Formant Data

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It is well known that the adult's vocal tract is not a uniform scaled up version of a child vocal tract. Considering these morphological differences, what are the articulatory strategies used by the speaker throughout growth to produce the same vowels? Our previous simulation study [1] predicts that a speaker with a newborn-like vocal tract would employ a fronting articulation compared to an adult male, in order to produce the same acoustic targets. In this paper, we extend our simulations with the VLAM model to a 4-year-old and a 10-year-old children, a 16-year-old boy and an adult man. Articulatory positions, for each growth stage, for the 4 vowels [i], [y], [u], and [a] have been determined using a formant-to-articulatory inversion method. Analysis of real data is finally presented.

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