

Articulating while listening: The perception-production link in early infancy in (a)typical development

Several approaches to infant speech perception proposed that the auditory analysis of speech is coupled with articulatory and motor information involved in speech production. Research on sensorimotor influences has demonstrated that experimentally induced inhibitions to tongue movement selectively affected phoneme discrimination and prosody perception. However, research has not yet addressed whether infants produce linguistically-driven articulatory movements when perceiving speech. To address this key question, we employed ultrasound imaging to record the tongue shapes of 6-month-old infants while listening to VCV tokens where only C varies: [apa], [ata], [aka]. Tongue image analysis was performed with AAA software and the Curve Position (CP) measure was used to determine differences in tongue shape (lower values for back, higher for front) across token types. CP was extracted in 16 equally spaced intervals within the 1s interval after the presentation of each VCV token. If tongue shape varies as a function of the token heard, we expect lower CP values triggered by listening to [k] as opposed to higher values for [t]. A linear mixed-models analysis found an effect of token type, and pairwise contrasts showed that CP values for [ata] were higher than for [aka]. These results suggest that 6-month-old infants produce articulatory movements by moving the tongue more to the front or back in the direction of the sounds they heard. We are currently testing infants with Down Syndrome, that display oral-motor dysmorphologies, to examine whether this atypically developing group also engages in speech driven oral-motor responses modulated by the specific sounds perceived.