

Organization of simplex and complex onsets in 5 and 6-year old children’s production

Sandra Peters, Felicitas Kleber

Institute of Phonetics and Speech Processing, Ludwig Maximilian University, Munich, Germany

As early as the age of two years, children begin to produce consonant clusters, but the development up until adult-like mastery is protracted and characterized by a great amount of variability in the gestural coordination of complex onsets. This study is based on ample evidence for globally timed onset clusters in adult speech, i.e. consonants are organized around a stable midpoint, causing a shift of the preceding consonant (C) into the vowel (V) in complex onset words. To investigate children’s coordination of onset clusters, recordings were made using electromagnetic articulography. In a picture naming task, four L1 German children aged 5;10 to 6;10 produced real words containing either simplex (/l/, /n/) or complex (/kn/, /pl/, /pfl/, /kl/) onsets (three repetitions) embedded between the words /pitsa/ (*pizza*) and /apfəl/ (*apple*). This /a/ context allows for optimal articulatory measurements. Sensors attached to the tongue tip, the tongue back and the lips were analyzed. CV_{lag} was measured between the consonant’s plateau offset and the acoustic vowel midpoint for each token, and then the singleton lag was divided by the corresponding cluster lag by speaker and item. Values above 1 indicate a shift into the vowel; values below 1 a shift away from the vowel. The CC_{lag} was calculated by subtracting the initial consonant’s plateau offset by the second consonant’s plateau onset. Similar to adults, all children showed more overlap in /kl/ than in /kn/ (cf. Figure 1), although there were speaker-dependent differences in the degree of overlap. CV_{lag} ratios were around 1 (cf. Figure 2), indicating no shift into the vowel. As far as consonant-to-consonant timing in /kl/-and /kn/-onsets is concerned, our data revealed adult-like coordination in children. However, children’s CV timing patterns do not support a global organization of onset clusters.

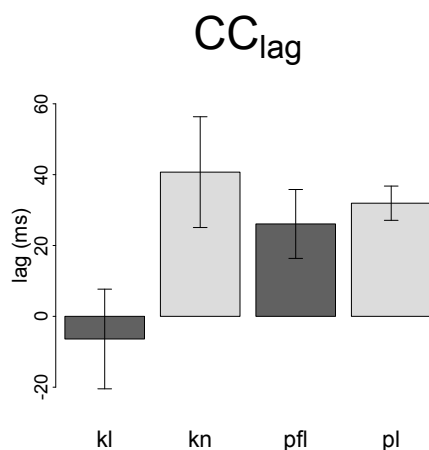


Figure 1: CC_{lag} values separately for each complex onset.

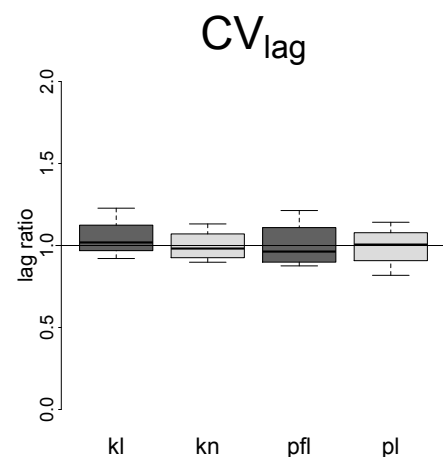


Figure 2: CV_{lag} differences between simplex and complex onsets separately for each onset pair.