Effects of jaw movement on CC coarticulation and compensatory consonant shortening

Manfred Pastätter

Institut für Phonetik und Sprachverarbeitung, LMU München

Early articulatory research showed that speech is characterized by periodic lowering and raising of the jaw, i.e. due to consonants having higher jaw positions than vowels this leads to a open-close jaw cycle. Upon this observation, subsequent studies raised the possibility that phonological and phonetic properties of the syllable are attributable to the jaw cycle. In this talk, we refer to the recent suggestion that segment duration and coarticulatory overlap are inter-related with the jaw cycle. This means, for instance, that with increasing onset complexity (i.e. $CV \rightarrow CCV$) more segments have to be seated into a temporal frame (i.e. the open-close jaw cycle) which leads to increased gestural overlap and shortening of involved segments. This, in turn, implies that in the cluster condition the vowel-adjacent consonant should generally allow for jaw height variability, coarticulatory overlap, and compensatory shortening. Since consonants have been found to differ in terms of jaw height and coarticulation resistance (i.e. $\frac{1}{1} > \frac{1}{1} > \frac{1}{1}$), it is unlikely that the jaw cycle is a generally occurring phenomenon. Hence, we hypothesize that the emergence of a jaw cycle is determined by the inherent jaw height and coarticulation resistance of the vowel-adjacent consonant. More precisely, we expect more coarticulatory C_1C_2 overlap if C_1 has a higher jaw compared to C_2 (i.e. jaw cycle) than if C_1 has a lower jaw compared to C_2 (i.e. no jaw cycle). In this talk we discuss the inter-relation of jaw cycle movements, CC overlap, and consonant duration by means of preliminary data of /mf-/, /pt-/, /pn-/ und /pl-/ Polish onset clusters which correspond to different degrees of jaw height and jaw coarticulation patterns of the vowel-adjacent consonant.