

Pharyngeal consonants involve a primary articulation in the pharynx while pharyngealised sounds (consonants or vowels) involve a primary articulation in the oral cavity and a secondary articulation in the pharynx. Both types of sounds are prominent in Afro-Asiatic languages. Over the last 50 years, the study of these sounds has fascinated many a linguist due to their varied phonological representations, their complex articulation and co-articulation patterns, their late development in the process of language acquisition, and their sociolinguistic and crosslinguistic patterning. Approaches to the study of pharyngeal and pharyngealised sounds have varied from phonological work looking at identifying consistent and uniform characteristics for this class of sounds to experimental work looking at auditory, acoustic, and articulatory manifestations of pharyngeal constrictions.

The production of pharyngeal sounds involves a constriction of the lower pharynx, including tongue root and epiglottal retraction, and a slight forward displacement of the back wall of the lower pharynx. On the other hand, pharyngealized consonants have a secondary articulation represented by the retraction of the tongue mid-way in the pharynx between the place of articulation of uvulars and pharyngeals. Arabic is uniquely rich in this latter category of sounds, also called emphatics, since they play an essential role in its phonetics and phonology. Emphasis has received a lot of attention in the literature due to the disagreement on the exact location of the secondary articulation and its potential effect on the primary articulation and on the surrounding vowels.

In terms of secondary articulation, emphasis has been associated with the co-occurrence of one or more of the following articulatory features: (1) slight retraction, lateral spreading, and concavity of the tongue and raising of its back (velarisation), (2) faucal pharyngeal constriction (pharyngealisation), (3) slight lip protrusion or rounding (labialisation), and (4) increased tension of the entire oral and pharyngeal musculature resulting in the emphatics being noticeably more fortis than the plain segments. Further work points to the involvement of the root and the epiglottis in the production of pharyngeals. Regardless of the exact location of the secondary articulation, the majority of work on emphatics has revealed that they are accompanied by a pharyngeal constriction. In terms of primary articulation, there have been some conflicting suggestions regarding whether or not the pharyngeal constriction accompanying the emphatics causes the apex of the tongue to be retracted from its main articulation.

As for acoustic manifestation, pharyngeal constriction has been associated with the enlargement of the oral cavity which significantly lowers F2 in the consonant loci itself and in the following vowel, whereas the decrease of the volume of the pharyngeal cavity raises F1. The effect of F2 has been shown to be more robust than that of F1, while F3 patterns have been found to be inconsistent. This is in stark contrast to the role of F3 in pharyngealised vowels in Caucasian languages such as Tsakhur and Udi and in American English rhotic vowels where it has been found to be lowered due to the pharyngeal constriction coinciding with the widening of the area between the tongue dorsum and uvula. Pharyngealisation of vowels in these languages must therefore be articulatorily and acoustically realised differently from pharyngealisation in Arabic.

The considerable changes of the pharyngeal cavity during the production of the pharyngeal/pharyngealised consonants result in noticeable shifts in the acoustic spectra of both consonant and vowel, which has triggered a discussion around whether the vowels themselves are underlyingly pharyngeal. From a perceptual point of view series of experiments have been designed with the aim to figure out whether

the perception of the pharyngealised consonants is conditioned by the presence of a pharyngealised vowel. Once again F2 manipulation seems to play a bigger role in the perception of pharyngealisation than F1. Elsewhere, work has looked at the degree of emphasis spread in terms of minimal and maximal domains within the syllable / word and at the direction of co-articulation (rightwords or leftwords). This has triggered discussions around whether emphasis should be considered a property of the consonant or the vowel, or whether it is a suprasegmental feature that affects whole stretches of speech.

In terms of phonological acquisition, while all babies produce pharyngeal sounds as part of their vocalisations in the first few months of life, these sounds tend to drop out of infants' production after the 5th month of life as the pharynx becomes separated from the main oral tract and the babies start tuning to the sounds of their own language. In languages that contain pharyngeal and pharyngealised sounds in their inventory, these sounds have been found to develop late due to their complex articulation. Finally, from a sociolinguistic perspective, pharyngeal and pharyngealised sounds have been found to vary in their phonetic and phonological implementation across not only languages and language varieties, but also social factors such as gender and social class. For instance, research in the Arab world has shown a tendency for females to produce plain realisations of pharyngealised sounds as a sign of feminine behaviour.