

Perceiving Phonemes, Reading Retinas, Twisting Tongues - from Articulation to Reading

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Both, learning to talk, and learning to read and write are multimodal, sensorimotor functions. Two prominent approaches must be mentioned when we discuss these cognitive functions: the motor theory of speech, which has seen quite a renaissance before being dismissed all over, and the sensational mirror neurons, which were considered to be the all-explaining discovery of the last decade. Bearing on these theoretical aspects, we will embark on a research journey that takes us from ‘seeing to articulate’ to ‘listening to read’.

It wasn't until the 1950s that speech perception received attention from a perspective inclusive of visual speech processing. Owing to Sumbly and Pollack, visual aspects of speech signals were focused on for the first time in research (Sumbly & Pollack, 1954). The McGurk effect, discovered by McGurk and MacDonald in 1976, shows that the visual aspects of speech could, literally, not be ignored (McGurk & MacDonald, 1976). The ‘viseme’, the visual equivalent to the acoustic phoneme is of importance here – and we will look at the underlying concept and some eyetracking data that shed light on the topic of speechreading. I will also discuss the steps from reading visemes to reading graphemes.

With both kinds of language learners, i.e. children and adults, (re-)learning to talk can be a tedious affair. Yet, it need not be, because, after all, learning a language is fun and should meet the criteria of ‘edutainment’. Does raising a learner’s awareness of the motor gestures of sounds help? And, once learners have mastered the motor aspects of sounds, can they also distinguish various new sounds acoustically? Motor speech skills may be easily assessed through child-friendly imaging

such as Ultrasound Tongue Imaging (cf. Adler-Bock, Bernhardt, Gick, & Bacsfalvi, 2007; Bernhardt et al., 2008; Modha, Bernhardt, Church, & Bacsfalvi, 2008). Visual feedback imaging found its way into the second language classroom via speech clinic settings: From articulation therapy studies with visual feedback techniques such as electropalatography (EPG – cf. Fiona Gibbon’s (2009) overview) comes evidence for the profound qualities of visemes for instance for the sounds that are most difficult in the pronunciation classroom: the posterior sounds that cannot be seen (e.g. velar and palatal stops, rhotics and fricatives). The question that remains is: how does the perceptual system benefit from the new articulatory abilities?

I will demonstrate how ultrasound may be useful to help resolve the ‘pronunciation exasperation’ and discuss how visual feedback is beneficial in various settings – in clinical situations as well as in an L2 learning environment.

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