

DESCRIPTION FOR THE GENERAL PUBLIC

Sigmatism (lisp) is a frequent speech disorder in which sibilant consonants /s, z, ts, dz/, /ʃ, ʒ, ʒ, dʒ/, /ɛ, z, tɛ, dɛ/ are misarticulated. Several types of sigmatism can be distinguished. Current diagnosis of sigmatism relies on the observation of articulators. However, it is not always possible to precisely observe processes inside the mouth, especially in case of a child. Currently the diagnosis can hardly be considered objective, since the phoneme realization assessment depends on the hearing sensitivity of a therapist, her/his experience, knowledge, and skills. Not all types of sigmatism are recognized properly and not all pathological pronunciations are perceived. Mistakes made upon diagnosis significantly decrease the effectiveness of the speech therapy.

The aim of the project is to broaden knowledge on the acoustics of sigmatism by developing a hybrid system for acquisition and processing of multimodal signals describing sigmatism in children. Recorded and analysed data will include multichannel, spatial speech signal and stereoscopic video signal showing the articulators. Synchronized multimodal data will be associated with the speech therapy annotation. Moreover, an optical tracking system will be employed to objectify acquisition of multichannel speech signal and stereoscopic articulator image. The expected result of the research is a discovery of interconnections between acoustics, articulator appearance, and articulation. A long-term goal of the research is to develop a methodology for the analysis of multimodal signal to support the diagnosis of sigmatism.

Speech diagnosis examinations will involve five- or six-year old children, since this is the age of achieving the ability of correct realization of all phonemes in Polish. Acoustic analysis of pathological speech data along with the visual assessment of articulator images will be a significant contribution to the Polish and international knowledge on sigmatism mechanisms and diagnosis. Furthermore, the project gives an opportunity to develop and construct a comprehensive reference database of multichannel Polish preschool children's speech data synchronized with stereoscopic articulator images and diagnostic annotations. Such a database can be used broadly in future research.