

Acoustic, perceptual and gestural correlates of (sub)phonemic distinctions: aperture in obstruents

In linguistic research, meanings are typically distinguished based on contrastive features, i.e. properties of sounds and words that are big enough to be perceived by speakers. In phonology, such contrastive units are phonemes. Several psycholinguistic and phonetic studies, however, have shown that sound differences detectable in the course of detailed acoustic analysis but not considered contrastive in the world's languages can play a role in speech comprehension and production. The aim of this project is to investigate such subphonemic features from three different angles: acoustics, perception and body movements accompanying speech production. The feature chosen as the subject of this research is aperture – the degree of openness of a consonantal sound. The language taken under scrutiny is Spanish, in a comparative perspective.

First, a large corpus of recorded speech from Gran Canarian Spanish will be analysed acoustically to identify the exact differences between voiced and voiceless obstruents in terms of speech signal parameters. The identified differences will be then classified into categories and native speakers will be tested to see whether they 'hear' such sound distinctions. Auditory perception is important for speech comprehension in communicative situations, hence it will be used as a key marker of contrastiveness. Moreover, speakers of another Spanish dialect and of two other languages (Polish and German) will also be tested to see whether the identified sound differences are important for Gran Canarian Spanish only or apply to other dialects and languages as well. If the identified sound distinctions are cross-linguistically important, the notion of meaningful (contrastive) features might have to be revised. To supplement these two axes of research, a third experiment will be performed. Native speakers of the dialect will be asked to produce words contrasting by the said features in a motion capture lab setting. Their body movements will be recorded and compared with the prominence of the produced sounds depending on the position in a word and sentence. This experiment will show whether perception and production are guided by gestures and not by the acoustics of the speech signal alone.

As outlined above, the proposed project will use three different methods to determine whether non-contrastive, small differences between sounds are truly important for speech comprehension. The significance of such details is crucial for the understanding of language contrasts and for second language acquisition. Apart from informing us on which parts of the speech signal are meaningful, the research will contribute to the study of Spanish, provide more information on the differences between the consonants of this language and two other languages, and help us understand and further investigate issues related to language learning in school and university settings. Given that the perception of speech does not necessarily go hand in hand with speech production, it is worth pursuing this topic to advance our knowledge of linguistic processes.