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Keynote lecture abstract

Talking postures

Studies – and theories – of speech have typically focused on transient events – those that happen over relatively short time intervals. However, many of the properties we associate with speech sounds are maintained over a longer time period. For example, unless otherwise specified, all human languages use primarily oral (i.e., non-nasal) sounds, use modal voice, and maintain a consistent "articulatory setting" of the tongue. Each of these requires constant maintenance of some distinct "posture": e.g., a closed velopharyngeal port, adducted vocal folds, and lateral bracing of the tongue. These longer-term aspects of speech are analogous to body postures.

Posture is a necessary part of any motor system, and is a precursor to other voluntary movements such as reaching and walking (Ting, 2007). We have long known that speakers maintain a "basic speech posture" (Öhman 1967), adopted prior to speaking (Perkell 1969). We have since learned that speech postures are language-specific. For example, Gick et al. (2004) showed that English and French speakers maintain distinct postures of the tongue, lips and other parts of the vocal tract during the non-speech pauses between utterances, and Wilson et al. (2007) showed similar findings for Japanese speakers. However, little has been known about these postures, how and why they work, and how they fit into our theories of sound systems. Previous studies have not generally attempted to observe how postural movements interact with transient ones, nor have previous models attempted to provide coherent mechanisms for how these interactions should work.

The oral region is arguably the most complicated part of the human body, used for many of our most complex behaviors, many of which may overlap in time (think of whether you have ever been talking while, say, expressing a facial emotion, or chewing). Examples of postures in speech and non-speech (e.g., emotion expression) domains will be considered. Biomechanical simulations and laboratory experiments will be used to show how postures operate on the same principles as transient movements (except for the difference in duration), and all of these can overlap with multiple other activations – whether transient or postural – through simple superposition of muscle activations (Bizzi et al. 1991). A superposition model must also involve commands to deactivate, known as inhibition or suppression. Through these examples of posture, I will argue that no speech sound can be understood or even measured without seeing each sound as superimposed on a substrate of posture.

References

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