

BIDIRECTIONAL CONTEXT EFFECTS IN PERCEPTION OF SYNTHETIC  
FRICATIVE-(STOP-)VOWEL STIMULI

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In this paper, we describe two examples of context dependency in speech perception--one retroactive, the other proactive--and report a series of experiments conducted to delimit the conditions necessary for their occurrence. The retroactive effect is observed when stimuli from a synthetic /ʃ/-/s/ continuum are followed by different vowels: Listeners report /s/ more often when the vowel is rounded than when it is not (Kunisaki and Fujisaki, 1977). We have replicated this effect using /a/ and /u/ as vowel contexts. We find that the magnitude of the retroactive effect changes little as fricative noise duration is extended, but that it is substantially reduced when silent intervals of varying sizes are introduced between noise and periodic portions. The proactive effect occurs when stimuli from a synthetic /da-/ga/ continuum are preceded by a fricative: Listeners give more velar stop responses following /s/ than following /ʃ/. This effect is remarkably persistent, although its magnitude does decrease with increased temporal separation of noise and periodic portions and with presence of a syllable boundary between fricative and stop.

In both cases, there are certain parallels between our perceptual results and coarticulatory effects in speech production. The retroactive effect corresponds to the effect of anticipatory lip rounding on the spectrum of fricatives preceding rounded vowels (Kunisaki and Fujisaki, 1977), and we have obtained some evidence for a forward shift in place of articulation for stops following /s/, which is consistent with the proactive effect in perception. Thus, speech perception appears to be guided by an implicit knowledge of articulatory dynamics.

References

- Kunisaki, O., and Fujisaki, H. (1977): "On the influence of context upon perception of voiceless fricative consonants", Annual Bulletin of the Research Institute of Logopedics and Phoniatrics (University of Tokyo) No. 11, 85-91.