

# ABSTRACTS OF CONTRIBUTIONS TO BE PUBLISHED IN INTERNATIONAL JOURNALS

## PERCEPTUAL AND ACOUSTIC ASPECTS OF LEXICAL VOWEL REDUCTION, A SOUND CHANGE IN PROGRESS

*Dick R. van Bergem*

Abstract of paper to be published in:  
*Speech Communication*

In the present study 20 Dutch male speakers were asked to read aloud 47 test words in a word list and in short sentences. Part of this word set was also named by them through the presentation of pictures. A group of 20 listeners was asked to identify an unstressed vowel in all of these test words. The vowel responses of listeners were recoded into two broad categories: "full vowel" and "schwa". Our aims were (1) to find out to what extent listeners are able to unambiguously distinguish between these two categories, (2) to investigate the influence of the frequency of occurrence of words on the classification of the test vowels, (3) to investigate the influence of speaking styles on the classification of the test vowels by comparing the speech conditions "word list", "pictures", and "sentences". The experimental results showed that (1) listeners often could not unambiguously classify the test vowels, especially if these occurred in interstress position, (2) the number of schwa responses was much higher for vowels in words with a relatively high frequency of occurrence, (3) the number of schwa responses increased in a more casual speaking style. Acoustic measurements on the test vowels revealed a clear relation between the perceptual results and the acoustic features of the vowels. Although the preconditions for the sound change "full vowel → schwa" in several Dutch words are excellent, the actual completion of the sound change is in our view to a large extent blocked by the rather close correspondence between Dutch vowel sounds and their orthographic representations.

## DISCRIMINATION OF SINGLE AND COMPLEX CV- AND VC-LIKE FORMANT TRANSITIONS

*Astrid van Wieringen and Louis C.W. Pols*

Abstract of paper to be published in:

*Journal of the Acoustical Society of America*

Two discrimination experiments were performed to determine auditory sensitivity for single and complex CV- and VC-like formant transitions. In Experiment 1 difference limens in endpoint frequency were determined by means of same/different paired comparison tasks for 20-ms, 30-ms, and 50-ms second formant (F2) speechlike transitions, followed or preceded by an 80-ms vowel-like steady-state in initial or final position, respectively. The F2-transition was either single or part of a multi-formant (complex) stimulus, containing also a fixed F1-transition with steady-state, a stationary third formant, and a 20-ms voice bar. Just noticeable differences in endpoint frequency decrease with increasing transition duration in all conditions and are smaller for single transitions than for transitions in a multi-formant complex. Although difference limens in endpoint frequency increase with increase in frequency extent, they are smaller in final than in initial position. As for relative rate-of-frequency change: the smaller the frequency extent, the larger the difference limens of decrementing transitions, possibly because the endpoints of the transitions approach the frequency of the steady-state. Transitions varying in frequency and duration, in such a way that a constant rate of frequency change is maintained (Experiment 2), yield considerably smaller difference limens than those varying in frequency extent at a constant transition duration (Experiment 1). Discrimination is affected more by changes in duration than in frequency, even when the total duration of the stimulus remains constant. Both experiments show that transition rate is perceptually less important than endpoint frequency or transition duration in discriminating short speechlike transitions.