

ABSTRACTS OF CONTRIBUTIONS TO BE PUBLISHED IN INTERNATIONAL JOURNALS

A MODEL OF COARTICULATORY EFFECTS ON THE SCHWA

Dick R. van Bergem

Abstract of paper to be published in:
Speech Communication

In this study coarticulatory effects on the formant frequencies and on the duration of the Dutch schwa were investigated, both in open syllables and in closed syllables, by using nonsense words of the form $C_1\emptyset C_2V$ and $VC_1\emptyset C_2$. In these nonsense words C_1 and C_2 could be any of the consonants /p, t, k, f, s, χ, m, n, ŋ, r, l, j, v/ and V was taken from the vowel set /i, a:, u/. Consonants and vowels were systematically varied in all possible combinations which gave a total of 897 test words that were read aloud by three male speakers. It appeared that the coarticulatory effects on the schwa could be successfully described with a simple linear model. Especially for F_2 -tracks of schwas, the model fit turned out to be very good. The model for F_2 -tracks could also be successfully applied to schwas in meaningful words. We believe that the schwa should be interpreted as a vowel without articulatory target that is completely assimilated with its phonemic context. The widespread view of a schwa position in the *centre* of the vowel triangle, that the formant patterns of reduced vowels are shifting to, is not very accurate. In our interpretation vowel reduction results in a shift of formant frequencies to a schwa position that can be almost anywhere in the vowel plane, dependent on the phonemic context.

ACQUISITION OF VOWEL CONTRASTS IN DUTCH

Chris J. Clement

&

Frank Wijnen (University of Groningen)

Abstract of paper to be published in:
Journal of Speech and Hearing Research

The aim of this research is to disentangle the contributions of anatomical development of the vocal tract and articulatory learning to the acquisition of vowel contrasts. Four groups of subjects were selected: normal two-year-olds, normal four-year-olds, four-year-olds with a delay in phonological development of approximately 2 years, and adults. Elicited renditions of three Dutch vowels, /u/, /a/ and /ɑ/ were acoustically analysed. The F1 and F2 values of the two vowels constituting a large contrast (/a/ versus /u/) were significantly different in all subject groups. On the other hand, the extent to which the spectra of /a/ and /ɑ/ differed, appeared to be affected by age. The two-year-olds, in contrast to the normal four-year-olds and adults, produced non-distinctive F2s for these two vowels. The results from the phonologically delayed 4-year-olds paralleled those of the 2-year-olds, which suggests that the acquisition of subtle vowel contrasts is primarily dependent on articulatory learning, rather than the purported anatomical development of the vocal tract.

FREQUENCY AND DURATION DISCRIMINATION OF SHORT FIRST-FORMANT SPEECHLIKE STIMULI

Astrid van Wieringen and Louis C.W. Pols

Abstract of paper to be published in:
Journal of the Acoustical Society of America

Frequency and duration discrimination thresholds of short rising and falling one-formant speechlike transitions without a steady-state were determined by means of same/different paired comparison tasks in two experiments. When frequency extent is varied (experiment 1), just noticeable differences *decrease* with increasing transition duration. Expressed in Hz, thresholds are, on average, 70 Hz, 63 Hz, and 58 Hz for 20 msec, 30 msec, and 50 msec, respectively. However, when transition duration is varied at a constant frequency extent (experiment 2) difference limens *increase* with increasing duration and are, on average, 2.7 msec, 4.5 msec, and 4.9 msec for standard transitions of 20 msec, 30 msec, and 50 msec, respectively. The thresholds determined in the two experiments indicate that different psychoacoustical cues are used depending on whether final frequency (experiment 1) or transition duration (experiment 2) are varied. Both experiments were performed at two different frequency regions (between 200 Hz and 700 Hz and between 500 Hz and 1000 Hz), but the results did not differ per region. In addition, no significant differences were found between rising and falling transitions.

Particular attention was paid to a methodological issue, viz., the extent to which sensitivity changes as a result of different proportions of catch trials. It was found that the listeners maintained the same response strategies throughout the tests, as their performance is similar, irrespective of the number of catch trials included in the testing sessions.

THE (NON)REALISATION OF UNSTRESSED ELEMENTS IN CHILDREN'S UTTERANCES: A RHYTHMIC CONSTRAINT?

Frank Wijnen & Evelien Krikhaar (University of Groningen)
&
Els den Os

Abstract of paper to be published in:
Journal of Child Language

In this study, it is argued that the omission of closed-class morphemes and of unstressed syllables within words is related to their common characteristic, viz. that they are unstressed, rhythmically weak parts of utterances. Several strands of evidence indicate that it is unlikely that children are unable to perceive these elements in the input speech. We performed a longitudinal analysis of the pattern of (non)realisation of unstressed syllables within (content) words and a particular class of closed-class morphemes, viz. determiners in two Dutch children from 1;6 to 2;11. It appeared that polysyllabic words were quite generally truncated in such a way that fitted a trochaic (strong-weak) pattern particularly in the early samples. Some observations with respect to the (non)realisation of determiners are suggestive of an influence of an SW-constraint on the realisation of noun phrases. These findings support the hypothesis that in the course of utterance preparation, words and phrases are mapped onto SS(W) templates. Anecdotal evidence suggests that the dissolution of the SW-constraint coincides with the acquisition of specific aspects of stress assignment in Dutch, such as quantity sensitivity.