

## Coarticulation and vowel reduction in the neutral tone of Beijing Mandarin

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The neutral tone is one of the most important distinguishing features in Beijing Mandarin, but there are two completely different views on its linguistic function: a special tone(Xu,1980) versus weak stress(Chao,1968).

In this paper, the acoustic manifestation of the neutral tone will be explored to show that it is closely related to weak stress. 122 disyllabic words in which the second syllable carries the neutral tone, including 22 stress pairs, were uttered by a native male speaker of Beijing dialect and analysed by Kay Digital Sonagraph 5500-1. The results of the acoustic analysis are presented as follows:

1) The first two formants of the medial and the syllabic vowel moves towards that of central vowel with a greater magnitude in the syllable with the neutral tone than in the syllable with any of the four normal tones. Also the vowel ending, and nasal coda /n/ and / / in the syllable with the neutral tone tends to be deleted.

2) In the syllables with the neutral tone, there are strong carryover coarticulations between the medial and syllabic vowel and the preceding unvoiced consonant. In general, the vowel is affected to move towards the position of the central vowel with more greater magnitude by coronal consonant than by labial or velar consonant.

3) In the syllable with the neutral tone, when and only when it precedes a syllable with tone-4, the high vowel following [f],[ts'],[s],[ts'],[s],[tc'] or [c] tends to be voiceless.

4) It can be seen from the acoustical results of 22 stress pairs that the duration of the syllable with the neutral tone is on the average reduced to 55% of that of the syllable with the four normal tones, and the duration of the final in the syllable with neutral tone is on the average reduced to 45% of that of the final in the syllable with the four normal tones(Lin & Yan 1980).

5) The F0 contour of the neutral tone is highly dependent on the preceding normal tone(Lin & Yan 1993).

For a number of languages it has been found that the vowel space is reduced as the level of stress placed upon the vowel is reduced(Nord 1986). Therefore we reach the conclusion that the syllable with neutral tone is related to weak stress(Lin & Yan 1990). The neutral tone is not a special tone because the preceding normal tone.