

The tone-vowel interaction in Fuzhou revisited.

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There has been considerable work on understanding phonetic effects of segments on tone and on the influence of tone on segments (e.g. Maddieson 1977, 1984, 1997, Zee 1984 and others). Such phonetic differences are usually consequences of speech production and as such are relatively imperceptible. However, less attention has been given to effects of tone and segments that are not automatic phonetic changes, but rather changes that result from the phonology. In this paper I present data from the Fuzhou dialect of Chinese. I argue that the phonological tone is responsible for the rather catastrophic segmental effects, rather than the reverse. I will argue this point using data from four areas: (i) the vowels, (ii) the phonation, (iii) the sandhi tones and (iv) the duration and (v) diachronic/comparative dialectal evidence.

Fuzhou (Min; Fujian province, China) has seven citation tones and is well known for its changes in vowel quality that is dependent on the tonal context. A sample of the vowel alternations is given below.

Vowel “changes” in Fuzhou between registers.

[+upper]	i	y	u	ei
[-upper]	ei	øy	ou	ai

These (vertical) pairs of vowels such as [i]-[ei] and [ei]-[ai] can be deemed to be the ‘same’ vowel based on native speaker judgements and historical evidence. Native speakers were asked to identify which pair of vowels were more similar: [ei]s (from the [i]-[ei] pair and the [ei]-[ai] pair) or the two, very different vowels in their pairs [i]-[ei], and [ei]-[ai]. The latter vowel pairs were picked in every case. A sample of these is listed vertically in the table above, such as [+upper, [ei]]/[-upper, [ai]] pair. In addition to the fact that historically these vowel pairs were not different in quality and that the cognate words in other Chinese dialects typically maintain a consistent vowel in all tones, the native speaker judgments also suggest that these are the same phonological vowel and that the tonal register is somehow determining the quality of the vowel. However, it is clearly not an automatic effect, since the same vowel can occur in both contexts – but as phonetic realizations of syllables with different phonological tones (see also Maddieson 1976 on the unlikelihood of such effects being phonetic).

In this paper, I review two of the key proposals presented to account for these vowel alternations (Yip 1980 and Jiang-King 1996) which suggest that the vowel alternations must be accounted for either as a dynamic process or as a by-product of structural constraints within a synchronic theory of the phonology. However, both approaches run into difficulties when the full range of alternating vowel pairs and the new Fuzhou tonal data are considered.

In this paper I argue that the vowel changes are part of a more broadly attested phenomenon of cue maintenance in Fuzhou. To support this proposal, I present normalized F0 contours for each of the seven citation tones based on four speakers and roughly 54 tokens per tone per speaker. I offer phonological feature geometric representations for these tones using the reasonably standard register and contour tonal features (e.g. Bao 1990, Snider 1999). I argue that there is no clear phonetic interpretation of register given the acoustic data that I provide, and claim that this is a phonological feature (though see Donohue, 1992). I leave aside the question of whether there should be a clear phonetic correlate and merely note that it is thus possible to use the feature to account for some of the coincidental segmental changes. I discuss the non-modal phonation, the tone sandhi and duration as well as the vowel changes, which I argue all serve to perceptually enhance the tones in citation or pre-pausal position. Additionally I draw on comparative dialectal evidence to support the claim that the origin of the vowel alternations is an innovation in Fuzhou (and perhaps Min dialects more broadly).

References

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