

How retroflex apical vowels can be suffixed with the rhotic suffix in Mandarin dialects
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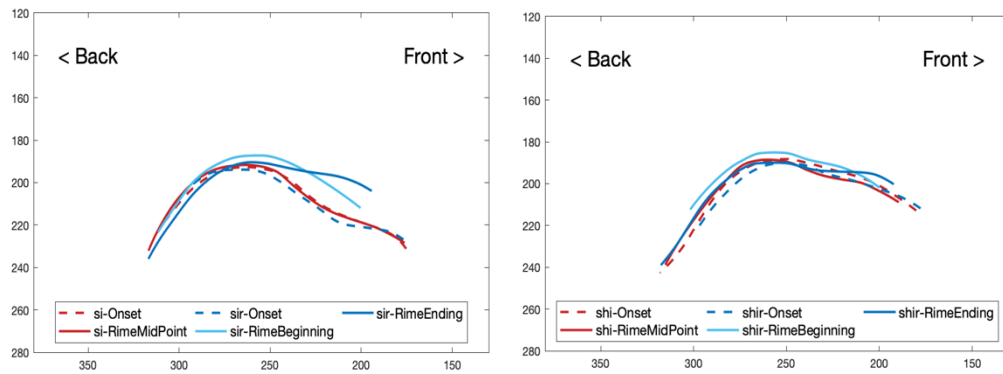
Introduction: The so-called “apical vowels” refer to typologically rare syllabic alveolar and retroflex approximants in Mandarin ([ɿ], [ʅ] respectively; see Lee and Zee 2014, Lee-Kim 2014 among others), which are diachronically derived via high front vowel /i/. In this effort, we extend previous research to the articulatory features of apical vowels in Northeastern (NE) Mandarin (Liaoning) and Southwestern (SW) Mandarin (Sichuan/Chongqing), besides the most well-studied variety, Beijing Mandarin. Our first research question is whether the apical vowels are articulatorily similar in the three varieties of Mandarin, although perceptually speaking, the apical vowels in the three dialects of Mandarin are *not* distinguishable. Indeed, Jiang et al. (2019) report in a recent cross-dialectal study of *Er*-suffixation that this rhotic (diminutive) suffix is invariably retroflex in Beijing Mandarin but is bunched in NE Mandarin, even though they are identified as the same sound in most contexts. Likewise, the present study helps fill the gap as to whether there is any cross-dialectal articulatory difference among the apical vowels. More interestingly, recall that for most Mandarin dialects, there is a contrast between alveolar vs. retroflex apical vowels. Yet both apical vowels may undergo *Er*-suffixation (compare: the rhotic vowel /ɤ/ cannot be *Er*-suffixed whatsoever) and the distinctions between unsuffixed vs. suffixed forms are auditorily robust across the board. Consequently, as our second research question, it is tempting to explore how an underlyingly retroflex apical vowel can be further suffixed with the *Er*-suffix in these Mandarin dialects.

Method: Ultrasound data from 22 speakers will be reported in this study (i.e., 10 speakers for Beijing Mandarin, 10 for NE Mandarin and 2 for SW Mandarin). The data were collected using Articulate Instruments Ltd.’s Micro System and were analyzed with the help of Mark Tiede’s GetContour. Stimuli contain *Er*-suffixed and unsuffixed CV syllables (here sibilant+apical vowel), embedded in a carrier phrase. Each token was repeated 3~10 times in a random order.

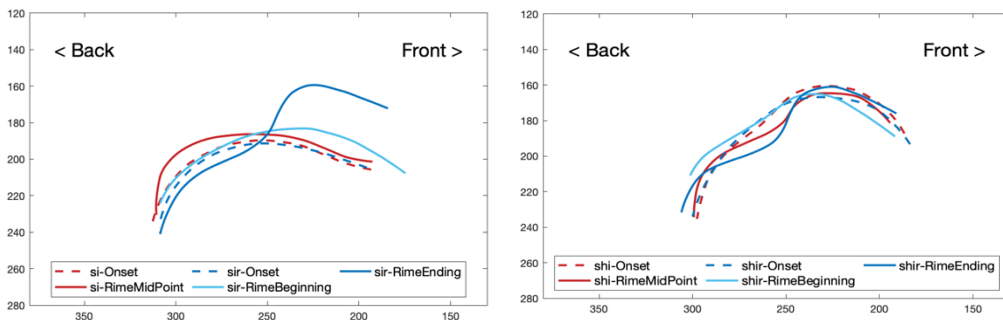
Results: (1) The apical vowels exhibit distinct tongue configurations in these Mandarin dialects, even though they are not perceptually distinguishable. The alveolar apical vowel, [sɿ] (shown as <si> below), has a grooving tongue shape in Beijing (1a: red lines), a retracted tongue dorsum in NE (2a: red lines) and a relatively flat tongue shape in SW (3a: red lines). Likewise, there is a domed tongue shape in [ʂ] in Beijing (i.e., <shi> below; 1b: red lines), a bunched tongue body in NE (2b: red lines) and a slightly domed tongue posture in SW (3b: red lines). Note also that the fricatives and the apical vowels share the same tongue configurations, suggesting that the apical vowels be regarded as a continuation of the sibilant onset. (2) Regarding *Er*-suffixation, for the alveolar apical vowels (<sir> below), the tongue tip is raised in Beijing (1a); in NE, the tongue blade is raised, while the rhotic suffix also induces a “pitting” in the tongue dorsum area (2a). In SW, <sir> involves the raising of the tongue tip and tongue blade (3a). As for the retroflex apical vowels (<shir> below), there seems no significant tongue movement in Beijing (1b: blue lines), except a minor tongue tip raising towards the end. In NE (2b: blue lines), the pitting of the tongue is the most significant component in the formation of <shir>. In SW (3b: blue lines), there is a minor tongue dorsum retraction. (3) It is equally remarkable that the above observations are highly consistent in the respective dialect groups. For example, the pitting of the tongue is found only in the *Er*-suffixation of NE Mandarin.

Discussion: Our results seem to suggest that there is a relatively stable perceptual goal for the apical vowels since distinct articulatory detail is confirmed in these closely related varieties of Mandarin. Likewise, the rhotic suffix is realized differently in articulation, which is similar to the case of the r-sound in English (Delattre and Freeman 1968, among many others). Finally, it is important to reiterate that, unlike English [ɹ], the *Er*-suffixation is implemented uniformly across speakers within the same dialect group, constituting an unprecedented instance of “articulatory uniformity” in the formation of the retroflex liquid.

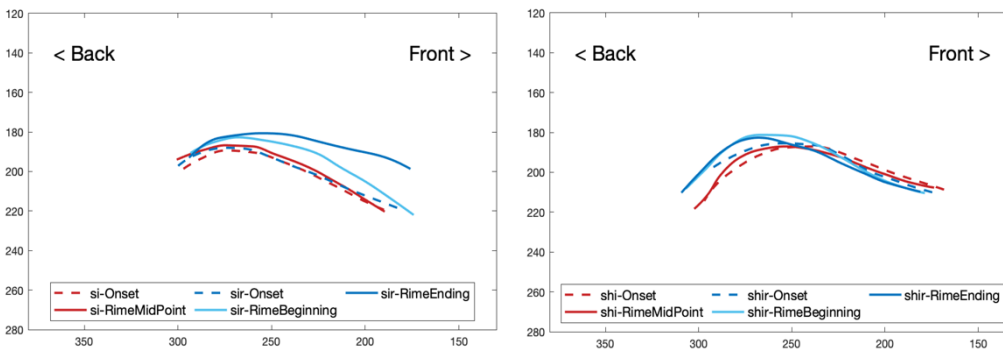
(1) Beijing Mandarin (Data from 1 representative speaker; N=10)



(2) Northeastern Mandarin (Data from one representative speaker; N=10)



(3) Southwestern Mandarin (Data from one representative speaker; N=2)



References

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