A Contrastive Hierarchy Analysis of the Mandarin Vowel System

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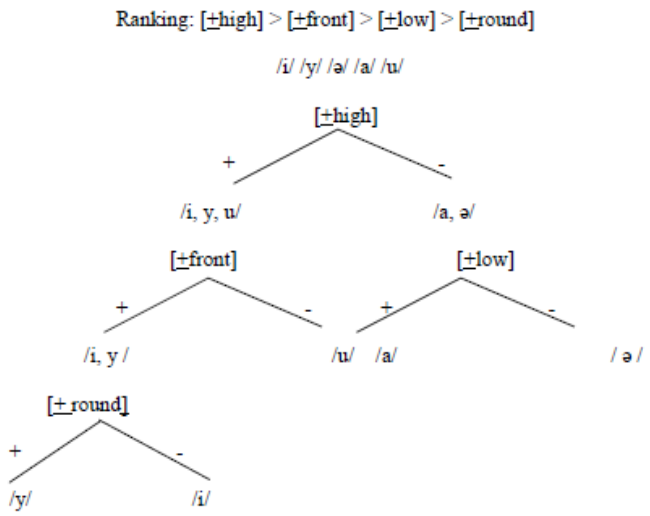
As Dresher (2009; 2015; 2018) mentions, phoneme inventories are best understood in relation to contrastive feature specifications, assigned in language-specific hierarchies by the Successive Division Algorithm (SDA). In the SDA, features are assigned to divide the inventory into smaller binary subsets until each phoneme is uniquely specified. The selection of the features is determined by examining the phonological processes (Dresher, 2009) and phonotactic distribution in a given language (Hall, 2016). Previous studies have been conducted (Zhang, 1996; Mackenzie, 2013).

The goal of my study is to conduct a contrastive hierarchy analysis of Mandarin vowels. In the Mandarin vowel system, there are five underlying phonemes /i/ /y/ /ə/ /a/ /u/ (Wiese, 1997; Duanmu, 2007). After examining the phonological processes in Mandarin, I will argue for the following ranking: [±high] > [±front] > [±low] > [± round], as shown below.



[± high] is selected for the contrastive hierarchy because in Mandarin, the three glides [j, ɥ, w] are derived from the underlying high vowels /i y u/ when these vowels occur in the onset with an adjacent vowel (Duanmu, 2007). [±front] is selected because it is a phonologically active feature in the mid vowel. /ə/ assimilates to [+front] when adjacent to /i/ or /y/. As shown below, /ə/ becomes [e] before or after /i/ and /y/. Also, /ə/ assimilates to [-front] when adjacent to /u/ (/ə/ becomes [o] before /u/). [± round] is used to distinguish /i/ from /y/ and [± low] is used to further divide non-high vowels /a/ and /ə/.

2 Frontness assimilation in the mid vowel.

	UR (underlying)	**SF (surface)**	**Gloss**
1.	f**əi**	f**ei**	fly
2	ɥ**yə**	ɥ**ye**	lack

3 Backness assimilation in the mid vowel

1	g**əu**	g**ou**	dog

The hierarchical organization of features in Mandarin vowels is [±high] > [±front] > [±low] > [±round] because it well explains the phonological processes and deriving natural classes in Mandarin. More specifically, [± high] is assigned to /i, y, u/ to make sure they undergo glide formation rule: high vowels become glides in the onset. [± front] is then specified on /i, y, u/ because /i/ and /y/ trigger frontness assimilation and /u/ triggers backness assimilation, so /i, y, u/ need to be specified with [± front] to trigger these two phonological processes. Here, /ə/ is crucially not specified with [± front] because a feature that is contrastively specified on one segment may spread to other segments on which it was not underlyingly specified (Hall, 2016). Then, [± round] and [± low] are phonologically inactive features used to further specify /i, y/ and /a, ə/.

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