PHONOLOGICAL PATTERNS IN ALL-YOWEL FINAL MANDARIN CHARACTER PHONETIC SERIES: AN INTRODUCTION

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The following paper will outline some underlying formulas for the pronunciation of Chinese characters in a select number phonetic series in Mandarin:

For initial consonant features of place of articulation, manner of articulation, voicing, and aspiration in Mandarin, the reader is referred to Kratochvil (The Chinese Language Today, 1968, p. 25).

For vowel features, I follow the features described by C.C.Cheng (A Synchronic Phonology of Mandarin Chinese,1973) for the underlying vowel phonemes in Mandarin which he posits, which I have rewritten in feature notation as follows:

For single Vowels (V):

ㄧ [+high]
+front
-round

ㄭ [+high]
+central
-round

ㄜ [+mid]
+back
-round

ㄚ [+low]
+back
-round

ㄨ [+high]
+back
+round

ㄩ [+high]
+front
+round

Due to certain properties of the vowel system as a whole in Mandarin, I will use the following simplified set of features for single vowels in Mandarin:

ㄚ [+low] (there is only one underlying low vowel phoneme in the Mandarin vowel system)

ㄜ [+mid] (there is only one underlying mid vowel phoneme in the Mandarin vowel system

i [+high]
-round

ɨ [+high]
-round

(For i and ɨ, since these never occur after the same initial consonants in Mandarin (see Cheng (1973, pp. 13-14) and attached "Table of the Speech Sounds of Beijing Dialect"), the features [+high] will be sufficient to specify either vowel after any given initial.)
-round

u [+back] (any underlying round vowel phoneme in Mandarin is also automatically high,)
+round so the feature +high is not needed here.

ü [+front] (any underlying round vowel phoneme in Mandarin is also automatically high)
+round so the feature +high is not needed here.

(For u and ü, since these never occur after the same initial consonants in Mandarin (see attached "Table of the Speech Sounds of Beijing Dialect"), the features [+round] will be sufficient to specify either vowel after any given initial.) Since both can occur after the null initial, the complete feature description of each, i.e., either +back, + round or + front, + round will be used following the null initial.)

For my use of Vowel + Vowel diphthongs in this paper, I follow the possible diphthong combinations of underlying vowel phonemes posited by Cheng (1973, p. 22). In Mandarin, these are as follows:

ɑi ɤi iɑ iɤ ɑu ɤu uɑ uɤ üɤ .

Due to the vowel + vowel cooccurrence restrictions for the formation of diphthongs in Mandarin, it is not necessary to stipulate all of the features of each in individual vowel in diphthong combinations, but rather it is only necessary to stipulate those features which will clearly identify each diphthong in Mandarin. I therefore will use the following combination of features to describe and identify diphthongs in Mandarin:

ɑi [+low][-rnd] (Since i is the only unround vowel to follow ɑ in a diphthong, the i in ɑi can be specified simply as [-rnd])

ɣi [+mid][-rnd] (Since i is the only unround vowel to follow ɣ in a diphthong, the i in ɣ i can be specified simply as [-rnd])

i ɑ [-rnd][+low] (Since i is the only unround vowel to precede ɑ in a diphthong, the i in i ɑ can be specified simply as [-rnd])

i ɣ [-rnd][+mid]) (Since i is the only unround vowel to precede ɣ in a diphthong, the i in i ɣ can be specified simply as [-rnd])

ɑ u [+low][+rnd] (Since u is the only round vowel to follow ɑ in a diphthong, the u in ɑ u can be specified simply as [+rnd])

ɣ u [+mid][+rnd] (Since u is the only round vowel to follow ɣ in a diphthong, the u in ɣ u can be specified simply as [+rnd])

u ɑ [+rnd][+low] (Since u is the only round vowel to precede ɑ in a diphthong, the u in u ɑ can be specified simply as [+rnd])

u ɣ [+back][+mid]
+rnd

ü ɣ [+front][+mid]
+rnd

(In actual practice, since u ɣ and ü ɣ never occur after the same initial consonants in Mandarin (see "Table of Speech Sounds of Beijing Dialect"), the features [+rnd][+mid] will be sufficient to describe either diphthong after any given initial consonant. Since both can occur after the null initial, the complete feature description of each, i.e.,

u ɣ [+back][+mid]
+rnd

ü ɣ [+front] [+mid]
+rnd

will be used following the null initial.

For triphthongs in Mandarin, we have the following vowels and combinations of features :

i ɑ u [-rnd] [+low] [+rnd]

i ɣ u [-rnd] [+mid] [+rnd]

u ɑ i [+rnd] [+low] [-rnd]

u ɣ i [+rnd] [+mid] [-rnd]

i ɑ i [-rnd] [+low] [-rnd]

(Since i is the only unround initial or final vowel in Mandarin triphthongs, and u is the only round initial or final vowel in Mandarin triphthongs, i can be specified as [-rnd], and u can be specified as [+rnd] in all Mandarin triphthongs.)

(For the general set of cooccurrence restrictions setting out which initials can or cannot occur with which finals in Mandarin, one is referred to the attached "Table of the Speech Sounds of Beijing Dialect".)

In general, we can write the following formulas which stipulate the underlying pattern for each phonetic series, i.e., which pattern of initials plus all-vowel finals describes the syllable pronunciations (segmental phonemes only) we find for any given character phonetic series in Mandarin:

The following are a select number of Mandarin character phonetic series, with all-vowel finals:

(108) 加 ga, ka, he, jia, qie

Velar + V (ga, ka)
[+affr.] [+low]

Velar + V (he)
[+fric] [+mid]

Palatal + V V
[+affr.] [-rnd] [+low] (jia)
-asp.

Palatal + V V (qie)
[+affr.] [-rnd] [+mid]
-asp.

(514) 皆 kai, ai, qi, ji

Velar, ϕ + V V (kai, ai)
[+affr.] [+low] [-rnd]
+asp.

Palatal + V (ji)
[+affr.] [-rnd]
-asp.

(428)皆 kai, jie, xie

Velar, + V V (kai).
[+affr.] [+low] [-rnd]
+asp.

Palatal + V V (jie, xie)
[-asp.] [-rnd] [+mid]

(130)可 ke, he, ge, e, a, qi, ji

Velar, ϕ + V (ke, he, ge, e)
[+mid]

ϕ + V (a)
[+low]

Palatal + V (ji, qi)
[+affr.] [-rnd]

(348)囷 qu, jue, ku

Velar + V (ku)
[+affr.] [+rnd]
+asp.

Palatal + V (qu)
[+affr.] [+rnd]
+asp.

Palatal + V V
[+affr.] [+rnd] [+mid] (jue)
-asp.

(733)学 xue, jue, jiao, huo

Velar + V V (huo)
[+fric.] [+rnd] [+mid]

Palatal + V V (xue, jue)
[-asp.] [+rnd] [+mid]

Palatal + V V V
[+affr.] [-rnd] [+low] [+rnd] (jiao)
-asp.

(615)虏 hu, xia

Velar + V (hu)
[+fric.] [+rnd]

Palatal + V V (xia)
[+fric.] [-rnd] [+low]

(250)有 you, yao, yu, hui, wei

ϕ + V (yu)
[+front]
+rnd

ϕ + V V V (you, yao)
[+rnd] [+high] [+rnd]

Velar, ϕ + V V V (hui, wei)
[+fric.] [+rnd] [+mid] [-rnd]

(788) 寿 shou, chou, dao, tao, zhu

Alveopalatal + V (zhu)
[+affr.] [+rnd]
-asp.

Alveopalatal + V V (chou, shou)
[+affr.] [+mid] [+rnd]
+asp.

{
Alveopalatal
[+fric.]

Alveolar + V V (dao, tao)
[+stop] [+low] [+rnd]

(216) 如 ru, shu, xu

Alveopalatal + V (ru, shu, xu)
[+fric.] [+rnd]

{
Palatal
[+fric.]

The 世贝 phonetic series, characters with pronunciations: shi, yi (also the 方色 series)

{	Alveopalatal	+	V	(shi, yi)
	[+fric.]		[+high]	
			-rnd	
	ϕ			

From even the relatively small number of character phonetic series outlined above, we can make the following generalizations regarding the patterning of all-vowel finals in Mandarin character phonetic series:

Phonetic series appear to fall into one of three broad groupings regarding the structure of all-vowel finals:

(1) Finals consist of all unrounded vowels;
(see series 108, 514, 428, 130 above)

(2) Finals consist of segments which have one round vowel;
(see series 348, 216, 733, 788, 250 above)

(3) Finals consist of any general vowel;

(such as series 615 above).

Additional research will show subpatterns of these three basic types of all-vowel final patterns in Mandarin character phonetic series.

REFERENCES

Cheng, C.C. 1973. A Synchronic Phonology of Mandarin Chinese. The Hague: Mouton.

Jichu Hanyu Keben (Elementary Chinese Readers). 198 .

Kratochvil. P. 1968. The Chinese Language Today: Features of an Emerging Standard. London: Hutchinson & Co., Ltd.

Wieger, L., S.J. 1927. Chinese Characters: Their Origin, Etymology, History, Classification and Signification. (Translated into English by L. Davrout, S.J.) (2nd ed., enlarged and revised according to the 4th French edition.) Hsien-hsien: Catholic Mission Press. (Republished, New York: Paragon Book Reprint Corp. & Dover Publications, Inc., 1965.)

Xinhua Zidian (New China Dictionary). 1971. Beijing: Shangwu Yinshuguan.

Zhou, Youguang. 1980. Hanzi Shengpang Duyin Biancha (A Handy Lookup for the Pronunciation of Phonetics in Chinese Characters). Jilin: Jilin Renmin Chubanshe.