An Introduction to the Phonological Basis of Chinese Characters in Modern Mandarin

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现代汉字语音简介

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Phonetic Compound （形声字xingshengzi）

- A “signific” part, which indicates meaning
- plus
- A “phonetic” part which indicates sound
- 妈 [ma1] = 女 (female) + 马 [ma3]

The Mandarin Syllable

- A syllable in Modern Standard Mandarin
- Consists of:
- An initial
- A final
- A tone

The Final

- The final can also be broken down into a medial (vowel), a nucleus (vowel) and an ending (vowel or consonant)

- Final = (M)N(E)

Mandarin Consonants

Source: Kratochvil (1968:25)	Labial	Labio-dental	Dental	Alveolar	Alveo-palatal	Palatal	Velar
stop	p, pʼ			t, tʼ			k, kʼ
nasal	m			n			(ŋ)
fricative		f	s		ʂ, ʐ(r)	ɕ	x
lateral				l			
affricate			ts, tsʼ		tʂ, tʂʼ	tɕ, tɕʼ	

Mandarin Vowels

ɿ ʅ i y(ü) u

e ə ɤ o

ɛ

a ɑ

Source: Cheng(1973:12)

Background Literature

- Xu Shen–說 文 解 字Shuo Wen Jie Zi (2nd cent. A.D.)
- Soothill-1911
- Karlgren-1916, 1923a, 1923b, 1926, 1940, 1949, 1958
- Wieger-1927/1965
- Astor-1970
- Zhou Youguang-周有光 1978,1980, 2003
- Kraemer-1980, 1991a, 1991b
- DeFrancis-1984
- Alber-1986,　１９８９

周有光 Zhou Youguang (1980)
汉字声旁读音便查 *Hanzi shengpang duyin biancha* (A handy look up for the pronunciation of phonetics in Chinese characters)

- Zhou analyzes characters in the Xin Hua Zidian (1971) based on Phonetic elements and sets up three categories of phonetic compound characters based on the similarity of the phonetic compound to the pronunciation of the phonetic itself.

- The 3 categories are:
- (1) Same pronunciation (同音 Tong yin), including same or different tones
- (2) Similar pronunciation (半同音 Ban tong yin) (similar phonemes)
- (3) Different pronunciation(异 音 Yi yin) (not as similar to the original phonetic pronunciation)

John DeFrancis (1984)

- DeFrancis also sets up three categories of phonetic compound characters based on the similarity of the phonetic compound to the pronunciation of the phonetic itself.

DeFrancis's 3 categories are:

- (1) "Complete identity" (same pronunciation including tone)
- (2) "Identity except for tones in some cases"
- (3) "Partial similarity in the segmental phonemes" (DeFrancis (1984))

Types of Phonological Patterning in Mandarin Characters

- Phonemic Congruence

  Characters share one or more phonemes
- Featural Congruence

  V’s share features

  C’s share features
- Initials and Finals: The Segment
- Segment Structure

  Patterning in arrangement of C’s or V’s
- Overall Patterns in the Written Language

Phonemic Congruence

Types of Phonetic Series Based on Phonemic Congruence (Kraemer 1980)

Seven Categories:

- Totally Perfect
- Segment Perfect
- Initial Perfect
- Final Perfect
- Tone Perfect
- Initial – Tone Perfect
- Final – Tone Perfect

Seven Categories of Phonetic Series Found in Wieger (Kraemer 1980)

579 Series Found + 63 (in Astor(1970))

For a Total of 642 Series

Out of 858 Series in Wieger(1927/1965)

Seven Categories of Phonetic Series Found in Wieger (Kraemer 1980)

Out of 858 Series in Wieger(1927/1965)

- Totally Perfect-124 (+63 in Astor(1970))
- Segment Perfect-192
- Initial Perfect-35
- Final Perfect-153
- Tone Perfect-40
- Initial – Tone Perfect-13
- Final – Tone Perfect-22

Totally Perfect

- 成 [tʂʻəŋ2] (chéng-become)
- is a phonetic in

  城 [tʂʻəŋ2] (chéng-city)

Totally Perfect

- 丈 [tʂɑŋ4] (zhàng-measure (land))
- is a phonetic in

  仗 [tʂɑŋ4] (zhàng-weapons)

  杖 [tʂɑŋ4] (zhàng-cane;stick)

Segment Perfect

长 [tʂɑŋ3] (zhǎng-grow) is a phonetic in 张 [tʂɑŋ1] (zhāng-surname, measure word)

Segment Perfect

马 [ma3](mǎ-horse) is a phonetic in

吗 [ma0] (ma-question word)
骂 [ma4] (mà-scold)
妈 [ma1] (mā-mother)

Segment Perfect

门 [mən2] (mén-door) is a phonetic in
们 [mən0] (men-plural)

Segment Perfect

方 [fɑŋ1] (fāng-place) is a phonetic in

房 [fɑŋ2] (fáng-house)
防 [fɑŋ2] (fáng-guard against)
访 [fɑŋ3] (fǎng-visit)
放 [fɑŋ4] (fàng-let go)

Initial Perfect

- 先 [ɕiɛn1] (xīan-first) is a phonetic in
- 洗 [ɕi3] (xǐ-wash)

- 你 [ni3] (nǐ-you) is a phonetic in
- 您 [nin2] (nín-you-polite)

Initial Consonant + Vowel (CV) Perfect

- 先 [ɕiɛn1] (xīan-first) is a phonetic in
- 洗 [ɕi3] (xǐ-wash)
- both share [ɕi-] xi-

- 你 [ni3] (nǐ-you) is a phonetic in
- 您 [nin2] (nín-you-polite)
- both share [ni-] ni-

Final Perfect

长 [tʂʻɑŋ2] (cháng)   张 [tʂɑŋ1] (zhāng). They share the final [ɑŋ] -ang .

方 [fɑŋ1] (fāng)   旁 [p’ɑŋ2] (páng) . They share the final [ɑŋ] -ang .

艮 [kən3,4] (gěn, gèn)   根 [kən1] (gēn) 很 [xən3] (hěn). They share the final [ən] -en .

方 [fɑŋ1] (fāng) Series-Quantitative Analysis

- 方 [fɑŋ1] (fāng-place;square;just a moment ago) is a phonetic in

房 [fɑŋ2] (fáng-house)
防 [fɑŋ2] (fáng-guard against)
访 [fɑŋ3] (fǎng-visit)
紡 [fɑŋ3] (fǎng-spin)
仿 [fɑŋ3] (fǎng-imitate, copy)
放 [fɑŋ4] (fàng-let go)
旁 [p'ɑŋ2] (páng-side)

Quantitative Analysis

方 [fɑŋ1] (fāng-place) is a phonetic in

2 [fɑŋ2]

3 [fɑŋ3]

1 [fɑŋ4]

1 [p'ɑŋ2]

In DeFrancis's Texts, from DeFrancis Index Volume-approx. 1700 chars. (DeFrancis (1970))

8 characters total with individual pronunciations

1 Phonetic element with 7 phonetic compounds

6/7 = 86% Segment Perfect

1/7 = 14% Final Perfect

But 7/7 = 100% Final Perfect or Better

Quantitative Analysis

方 [fɑŋ1] (fāng-place) is a phonetic in

房 [fɑŋ2] (fáng-house)-3/4 phonemes are the same as 方 [fɑŋ1]=75%phonetic

防 [fɑŋ2] (fáng-guard against)-3/4= 75%phonetic

访 [fɑŋ3] (fǎng-visit)-3/4= 75%phonetic

紡 [fɑŋ3] (fǎng-spin)-3/4= 75%phonetic

仿 [fɑŋ3] (fǎng-imitate, copy)-3/4= 75%phonetic

放 [fɑŋ4] (fàng-let go)-3/4= 75%phonetic

旁 [p'ɑŋ2] (páng-side)-2/4= 50% phonetic

Thus the average phonetic rating of the phonetic element 方 [fɑŋ1] in the above 7 characters would be 71.4 percent phonetic.

方 [fɑŋ1] (fāng) Series-Quantitative Analysis

方 [fɑŋ1] (fāng-place;square;just a moment ago) is a phonetic in

枋 [fɑŋ1] (fāng)
邡 [fɑŋ1] (fāng)
钫 [fɑŋ1] (fāng)
芳 [fɑŋ1] (fāng)
坊 [fɑŋ1] (fāng)
妨 [fɑŋ1] (fāng)
坊 [fɑŋ2] (fáng)
妨 [fɑŋ2] (fáng)
防 [fɑŋ2] (fáng)
肪 [fɑŋ2] (fáng)
魴 [fɑŋ2] (fáng)
房 [fɑŋ2] (fáng)
紡 [fɑŋ3] (fǎng)
仿 [fɑŋ3] (fǎng)
访 [fɑŋ3] (fǎng)
昉 [fɑŋ3] (fǎng)
舫 [fɑŋ3] (fǎng)
放 [fɑŋ4] (fàng)
旁 [p'ɑŋ2] (páng)
徬 [p'ɑŋ2] (páng)
[示]方 [pəŋ1] (bēng)

方 [fɑŋ1] (fāng) Series-Quantitative Analysis

方 [fɑŋ1] (fāng-place;square;just a moment ago) is a phonetic in

枋 [fɑŋ1] (fāng)
邡 [fɑŋ1] (fāng)
鈁 [fɑŋ1] (fāng)
芳 [fɑŋ1] (fāng)
坊 [fɑŋ1] (fāng)
妨 [fɑŋ1] (fāng)
坊 [fɑŋ2] (fáng)
妨 [fɑŋ2] (fáng)
防 [fɑŋ2] (fáng)
肪 [fɑŋ2] (fáng)
魴 [fɑŋ2] (fáng)
房 [fɑŋ2] (fáng)
紡 [fɑŋ3] (fǎng)
仿 [fɑŋ3] (fǎng)
访 [fɑŋ3] (fǎng)
昉 [fɑŋ3] (fǎng)
舫 [fɑŋ3] (fǎng)
放 [fɑŋ4] (fàng)
旁 [p'ɑŋ2] (páng)
徬 [p'ɑŋ2] (páng)
[示]方 [pəŋ1] (bēng)

Quantitative Analysis

方 [fɑŋ1] (fāng-place) is a phonetic in

6 [fɑŋ1]

6 [fɑŋ2]

5 [fɑŋ3]

1 [fɑŋ4]

2 [p'ɑŋ2]

1 [peŋ1]

22 characters total with indiv. Pronunciations (Zhou Youguang (1980))

1 Phonetic element with 21 phonetic compounds

6/21 =29% Totally Perfect

12/21 = 57% Segment Perfect

2/21 = 10% Final Perfect

1/21 = 5%Ending ŋ Perfect

But 18/21 = 86%Segment Perfect or Better

21/21 = 100% Final Perfect or Better

Quantitative Analysis

方 [fɑŋ1] (fāng-place) is a phonetic in

6 [fɑŋ1] 4/4 phonemes are the same as 方 [fɑŋ1]=6 X 100%phonetic

6 [fɑŋ2] 3/4 phonemes are the same as 方 [fɑŋ1]=6 X 75%phonetic

5 [fɑŋ3] 3/4 phonemes are the same as 方 [fɑŋ1]=5 X 75%phonetic

1 [fɑŋ4] 3/4 phonemes are the same as 方 [fɑŋ1]=1 X 75%phonetic

2 [p'ɑŋ2] 2/4 phonemes are the same as 方 [fɑŋ1]=2 X 50%phonetic

1 [peŋ1] 2/4 phonemes are the same as 方 [fɑŋ1]=1 X 50%phonetic

22 characters total with indiv. Pronunciations (Zhou Youguang (1980))

1 Phonetic element with 21 phonetic compounds

Thus the average phonetic rating of the phonetic element 方 [fɑŋ1] in the above 21 characters would be 81% percent phonetic.

Rime Perfect (NE Perfect)

- In a rime perfect phonetic series, the characters share this same main vowel or nucleus (N) followed by the same final vowel or consonant ending (E).

Rime Perfect

- 门 [mən2] (mén-door) is a phonetic in
- 问 [wuən4] (wèn-ask).

- They share the rime [ən] (-en) .

Rime Perfect: Underlying Forms

- 山 [ʂan1] (shān-mountain) is a phonetic in
- 仙 [ɕiɛn1] (xiān-immortal).

- They have the two rimes [an] and [ɛn]
- But they share the same ***underlying form*** of the rime (-an) (See Cheng 1973).

Rime Perfect: Underlying Forms

- 占 [tʂan1,4] (zhān-to divine; zhàn-to occupy) is a phonetic in
- 点 [tiɛn3] (diǎn- a point) and
- 店 [tiɛn4] (diàn-shop).

- They have the two rimes [an] and [ɛn.]
- But they share the same ***underlying form*** of the rime (-an) (See Cheng 1973).

Featural Congruence

Similar Vowel Features

- 是 [ʂʅ4] (shì-to be) is a phonetic in
- 題 [t’i2] (tí-topic) and
- 提 [t’i2] (tí-lift from above).
- They share the similar final vowels:
- [ʅ] (i) (in shi)   and   [i] (i)(in ti).
- The vowels [ʅ] , [ɿ] and [i] are high, unround vowels and can be considered allophones of the single phoneme -i (see Kratochvil 1968:28).
- Due to co-occurrence restrictions, [ʂ] takes only the back unround vowel [ʅ], while [t] takes only the front unround vowel [i].

Similar Vowel Features

- 是 [ʂʅ4] (shì-to be) is a phonetic in
- 題 [t’i2] (tí-topic) and
- 提 [t’i2] (tí-lift from above).
- C1 V / C2 V   (V = i) (phonemic) same final V phonemically)
- [ʂʅ4] / [t’i2]
- (shi) / (ti)

Similar Vowel Features

- 是 [ʂʅ4] (shì-to be) is a phonetic in
- 題 [t’i2] (tí-topic) and
- 提 [t’i2] (tí-lift from above).
- Cheng(1973:14) considers [ʅ] and [[1 to be variants of a high unround central vowel ɨ and [i] to be a separate underlying high unround vowel. Using his phonemic analysis, we might express the pattern [ʂʅ4] [t’i2] as
- [ʂʅ4] C1 V1 [+high,-round]
- [t’i2] C2 V2 [+high,-round]

Similar Vowel Features

- 是 [ʂʅ4] (shì-to be) is a phonetic in
- 寔提 尟湜题堤騠醍   (Zhou (1980))
- 湜[ʂʅ2]
- 寔[ʂʅ2]
- 尟[ʂʅO] [tʂ’ʅ2]
- 题 [t’i2]
- 提 [t’i2] [ti1]
- 騠[t’i2]
- 醍[t’i2]
- 堤[ti1]

Similar Vowel Features

- 是 [ʂʅ4] (shì-to be) is a phonetic in
- 寔提 匙湜题堤騠醍

We see the pattern

- [ʂʅ4] [ʂʅ2] [ʂʅ0] [tʂ’ʅ2] [t’i2] [ti1] as

- [ʂʅ4,2,0] C1 V1 [+high,-round]
- [tʂ’ʅ2]   C2 V1 [+high,-round]
- [t’i2]   C3 V2 [+high,-round]
- [ti1]   C4 V2 [+high,-round]

Similar Vowel Features

带[tai4] (dài-to wear) is phonetic in

滞(tʂʅ4)（Zhou1980)

- We see the pattern
- [tai4] [tʂʅ4] as

- [tai4] C1 V1 [+low,-round] V2 [+high,-round]
  [tʂʅ4] C2 V2 [+high,-round]

Similar Vowel Features

- (滴) [ti] (di) is a phonetic in

  滴[ti1] 嫡[ti2] 嘀[ti2] 镝 [ti1,2] 蹢[ti2][tʂʅ2]

  摘[tʂai1] 谪[tʂɤ2] (Zhou (1980))

- 滴[ti1]
- 嫡[ti2]
- 嘀[ti2]
- 镝 [ti1,2]
- 蹢[ti2][tʂʅ2]
- 摘[tʂai1]
- 谪[tʂɤ2]

Similar Vowel Features

- (滴) [ti] (di)is a phonetic in

  滴[ti1] 嫡[ti2] 嘀[ti2] 镝 [ti1,2] 蹢[ti2][tʂʅ2]

  摘[tʂai1] 谪[tʂɤ2] (Zhou (1980))

We see the pattern

- [ti1] [ti2] [tʂʅ2] [tʂai1] [tʂɤ2] as

- [ti1,2]] C1 V1 [+high,-round]
- [tʂʅ2] C2 V2 [+high,-round]
- [tʂai1] C2 V3V1 [+low,-round] [+high,-round]
- [tʂɤ2] C2 V4 [+mid,-round]

Initial Consonant Features

Final Perfect with Related Initial Consonants

长 [tʂ‘ɑŋ2] (cháng-long)   张 [tʂɑŋ1] (zhāng-surname, measure word).

They share the final [ɑŋ] -ang .

The initial Consonants are   [tʂ] zh   and   [tʂ‘] ch   .

Both initial Consonants are alveopalatal

(retroflex) affricates. They differ only in the feature of aspiration. The consonant   [tʂ‘] ch   is aspirated, while the consonant [tʂ] zh   is unaspirated.

Final Perfect with Related Initial Consonants

方 [fɑŋ1] (fāng-place) 旁 [p’ɑŋ2] (páng-side) . They share the final [ɑŋ] -ang .

The initial consonants are [f] and [p’] .

The initial consonant [f] is labiodental and the initial consonant [p’] is bilablial.

Final Perfect with Related Initial Consonants

艮 [kən3,4] (gěn, gèn -brusque;surname)

根 [kən1] (gēn-root)

很 [xən3] (hěn-very).

They share the final [ən] -en .

The initial Consonants are [k] g and [x] h .

- The consonants are both velars. They have the same place of articulation.

Initial Consonant Features

t

(Duanmu(2007))

- [+stop
  -fric
  -voice
  -asp
  +ant]
  +Cor

t’

(Duanmu(2007))

- [+stop
  -fric
  -voice
  +asp
  +ant]
  +Cor

t, t’

- [+stop

  -fric

  -voice

  +ant]

  +Cor

The two Consonants share voicleless anterior coronal stop features. They have 5 features in common, and differ in 1 feature. They differ only in the feature of [aspiration].

t, t’

党(tɑŋ3) Phonetic series（Zhou1980):

党(tɑŋ3) 谠 (tɑŋ3) 傥(t’ɑŋ3) (金)党(t’ɑŋ3)

- 党 =[+stop → t / 党 谠
  -fric t’ / 傥 (金)党
  -voice
  +ant
  +Cor

t

(Duanmu(2007))

- [+stop
  -fric
  -voice
  -asp
  +ant]
  +Cor

tʂ

(Duanmu(2007))

- [+stop

  +fric

  -voice

  -asp

  -ant]

  +Cor

t, tʂ

- [+stop

  -voice

  -asp]

  +Cor

The two Consonants share voiceless unaspirated coronal stop features. They have 4 features in common, and differ in 2 features, [friction] and[anterior]. (Note: the dental affricate [ts] also shares these features.)

t，tʂ

带(Tai4) Phonetic series（Zhou1980):

带 (tai4) 滞(tʂʅ4)

- 带 =[+stop → t / 带

  -voice tʂ / 滞

  -asp (ts does not occur)

  +Cor

t, tʂ

(滴)(Ti) Phonetic series（Zhou1980):

滴(ti1) 嫡(ti2) 嘀(ti2) 镝 (ti1,2) 蹢 (ti2, tʂʅ2)
摘(tʂai) 谪(tʂɤ2)

- (滴) = [+stop → t / 滴 嫡 嘀 镝
  -voice] tʂ / 摘 谪
  -asp t, tʂ /蹢
  +Cor (ts does not occur)

t‘

(SanDuanmu(2007))

- [+stop

  -fric

  -voice

  +asp

  +ant]

  +Cor

tʂʻ

(SanDuanmu(2007))

- [+stop

  +fric

  -voice

  +asp

  -ant]

  +Cor

t, tʂ

- [+stop

  -voice

  +asp]

  +Cor

The two Consonants share voiceless aspirated coronal stop features. They have 4 features in common, and differ in 2 features, [friction] and [anterior]. (Note: the dental affricate [tsʼ] also shares these features.)

tʻ tʂʻ

堂(tʻɑŋ2) Phonetic series（Zhou1980):

堂(tʻɑŋ2)螳(tʻɑŋ2)膛(tʻɑŋ2)镗(tʻɑŋ1,2)蹚(tʻɑŋ1)
樘(tʻɑŋ2) 瞠 (tʂʻəŋ1)

堂=[+stop → tʻ /堂螳膛镗蹚樘
-voice] tʂʻ /瞠
+asp (tsʻ does not occur)
+Cor

Initials and Finals:The Segment

To look at the full segment pronunciation of characters in phonetic series in Modern Mandarin, one needs to recombine initials and finals (the segment), looking at their combinations and paying attention to their co-occurrence restrictions.

Initials and Finals: The Segment

带(Tai4) Phonetic series（Zhou1980):

带 (tai4) 滞(tʂʅ4)

t, tʂ

带(Tai4) Phonetic series（Zhou1980):

带 (tai4) 滞(tʂʅ4)

带 =[+stop V[-mid,-rnd](V1)[+high,-rnd] 4 → tai4 / 带

-voice → tʂʅ4 / 滞

-asp]

+Cor (ts does not occur)

(ta, tai, ti, tʂɑ, tʂai do not occur)

t，tʂ

(滴)(ti) Phonetic series（Zhou1980):

滴(ti1) 嫡(ti2) 嘀(ti2) 镝 (ti1,2) 蹢 (ti2, tʂʅ2)
摘(tʂai) 谪(tʂe2)

(滴)= [+stop V[-rnd] (V1)[+high,-rnd] → ti1/ 滴 鏑
-voice → ti2 / 嫡 嘀 镝
-Asp → ti2, tʂʅ2 /蹢
+Cor] → tʂai /摘
→ tʂe2 /谪

(ts does not occur)

(ta, te, tei, tai, tʂɑ, tʂei do not occur)

Segment Structure

Same Consonant-Vowel Pattern

- 是 [ʂʅ4] (shì-to be)

  題 [t'i2] (tí-topic) and 提 [t'i2] (tí -lift from above).
- C1 V / C2 V   (V = i) (phonemic) (same final V phonemically)
- [ʂʅ] / [t'i]
- (shi) / (ti)

Other Consonant-Vowel Patterns: Rime Perfect

- 山 [ʂan1] (shān-mountain) is a phonetic in
- 仙 [ɕiɛn1] (xiān-immortal)
- C1 V n / C2 i V n (V = a) (same underlying vowel)
- [ʂan] / [ɕiɛn]
- (shan) / (xian)
-
- 占 [tʂan1] (zhān-to divine) is a phonetic in
- 点 [tiɛn3] (diǎn- a point) and 店 [tiɛn4] (diàn-shop).
- C1 V n / C2 i V n   (V = a) (same underlying vowel)
- [tʂan] / [tiɛn]
- (zhan) / (dian)

Overall Patterns in the Written Language

d, zh Phonetic Series

- （Di）（滴）di, zhi, zhe, zhai
- Dai 帯 dai, zhi
- Ding定 ding, dian, zhan
- Du du , dao , zhuo
- Dui 队（）dui, zhui
- (zhuo)（啄）du, zhuo, zhu, zhong

t   tʂ (d, zh)

Phonetic + Compound Characters

- Ti（滴） ti tʂʅ tʂɤ tʂɑi
- Tai 带 tai tʂʅ
- Tiŋ 定 tiŋ tiɛn tʂan
- Tu tu tɑu tʂuo
- Tuei队 tuei, tʂuei
- (Tʂuo)（啄） tu tʂuo tʂu tʂuŋ

t ʈʂ ʈʂʻ (d, zh, ch)

- Di 氐 Di, de, zhi, chi

  ti tɤ ʈʂʅ ʈʂʻʅ

- (Chuo)（啜） duo, zhui, chuo, chuai

  tuo ʈʂuei ʈʂʻuo ʈʂʻuai

t   tʂʻ   (d, ch)

- Dang 当 dang, cheng

  tɑŋ tʂʻəŋ
- Dong 东 dong, chen

  tuŋ tʂʻən

tʻ ʈʂ ʈʂʻ (t, zh,ch)

Tong 童 tong, tuan, zhuang, chuang, chong

tʼuŋ tʼuan ʈʂuɑŋ ʈʂʻuɑŋ ʈʂʻuŋ

- (Zhen)（珍） tian, zhen, chen

  tʼiɛn ʈʂən ʈʂʻən

- Zhuan 专 tuan, zhuan, chuan

  tʼuan ʈʂuan ʈʂʼuan

t t‘ tʂ (d, t, zh)

- Dong东 dong, tong, teng, tu, zhong

  tuŋ t’ uŋ t‘əŋ t’ u tʂuŋ

t t‘ tʂ‘ (d, t, ch)

- Di 帝 di, ti, chi

  ti t’i tʂ‘ʅ

- Deng登 deng, teng, cheng, chen

  təŋ t’əŋ tʂ‘əŋ tʂ‘ən

t t‘ tʂ tʂ‘ (d, t, zh, ch)

- Dan旦 dan, da, tan, zha, zhou, cha

  tan tɑ tʼan tʂɑ tʂou tʂʼɑ

- Tun屯 dun, du, den, tun, zhun, chun

  tuən tu tən tuən tʂuən tʂʼuən

Zhou周 diao, tiao, ti, zhou, zhao, chou

tiɑu tʼiɑu t’i tʂou tʂɑu tʂʼou

A General Pattern of Initials

t   tʂ‘   (d, ch)

t   tʂ tʂ‘ (d, zh, ch)

t‘ tʂ tʂ‘ (t, zh,ch)

t   t‘   tʂ (d, t, zh)

t   t‘   tʂ‘   (d, t, ch)

t   t‘   tʂ tʂ‘ (d, t, zh, ch)

Each Series of Initials is a more restricted subset of the larger set of initials t   t‘   tʂ tʂ‘ (d, t, zh, ch).

A General Pattern of Initials

t   tʂʻ   (d, ch)

t   tʂ   tʂʻ (d, zh, ch)

tʻ   tʂ   tʂʻ   (t, zh,ch)

t   tʻ   tʂ (d, t, zh)

t   tʻ   tʂʻ   (d, t, ch)

t   tʻ   tʂ   tʂʻ   (d, t, zh, ch)

- [+stop]

  -voice

  +Cor

The Initials Consonants share voiceless coronal stop features. They have 3 features in common, and differ in 3 features, [friction] [aspiration] and [anterior].

t   t‘   tʂ tʂ‘ (d, t, zh, ch)

- However, the initial consonants above are a restricted set of voiceless coronal stops. The non-retroflex voiceless coronal stops (ts ts‘) (z   c) do not occur.

Summary of Initial Features

- t   tʼ   5 features in common, and differ in 1 feature,
- t, tʂ   4 features in common, and differ in 2 features

  tʻ tʂ   4 features in common, and differ in 2 features

  t   tʂʻ   (d, ch)

  t   tʂ tʂʻ (d, zh, ch)

  tʻ tʂ tʂʻ (t, zh,ch)

  t   tʻ   tʂ (d, t, zh)

  t   tʻ   tʂʻ   (d, t, ch)

  t   tʻ   tʂ tʂʻ (d, t, zh, ch)

- 3 features in common, and differ in 3 features

A General Pattern of Initials

Each phonetic series above represents an individual pattern of initial consonants, each of which is a subset of a more general pattern.

Final Patterns

- In addition to the initials, the finals in the above series are also showing definite phonological patterns.

t tʂ (d, zh)

- Di （滴） di, zhi, zhe, zhai

  ti, tʂʅ, tʂɤ, tʂɑi

- All Finals are V or VV, unround.

t   tʂ (d, zh)

- Dai 带   dai, zhi

                  tai, tʂʅ

- All Finals are V or VV, unround.

t   tʂ (d, zh)

- Ding 定   ding, dian, zhan

tiŋ   tiɛn   tʂan

All Endings are C (nasal)

All Vowels V are unround

t   tʂ (d, zh)

- Du   du , dao , zhuo

  tu   tɑu   tʂuo

  All finals are V or VV with one round vowel.

t   tʂ (d, zh)

- Dui 队   dui,   zhui

  tuei,   tʂuei

  Final Perfect (Same final)

t   tʂ (d, zh)

- (Zhuo)（啄) du,   zhuo,   zhu,   zhong

  tu,   tʂuo   tʂu   tʂuŋ

All finals have one round V [u]

t   tʂ tʂ‘ (d, zh, ch)

- (chuo)（啜） duo, zhui, chuo, chuai

tuo   tʂuei   tʂ‘uo tʂ‘uai

All finals have one round vowel and are diphthongs or triphtongs. All vowels have uV(i).

t   tʂ tʂ‘ (d, zh, ch)

- Di 氐   Di, de, zhi, chi

  ti   tɤ   tʂʅ   tʂ‘ʅ

- Finals are V (-round).

t   tʂʻ   (d, ch)

- Dang 当   dang, cheng

  tɑŋ   tʂʻəŋ

  All finals have Vŋ.

  All V are [-high, -round]

  Nuclear V has [ɑ] / [ə] choice.

t t‘ tʂ‘ (d, t, ch)

- Di 帝 di, ti, chi

  ti t’i tʂ‘ʅ

- Finals are V (+high,-round)

- Deng登 deng, teng, cheng, chen

  təŋ t’əŋ tʂ‘əŋ tʂ‘ən

- Finals are əC

tʻ tʂ tʂʻ (t, zh,ch)

Tong 童 tong, tuan, zhuang, chuang, chong

tʼuŋ tʼuan tʂuɑŋ tʂʻuɑŋ tʂʻuŋ

- (Zhen)（珍） tian, zhen, chen

  tʼiɛn tʂən tʂʻən

- Zhuan 专 tuan, zhuan, chuan

  tʼuan tʂuan tʂʼuan

t t‘ tʂ tʂ‘ (d, t, zh, ch)

- Dan旦 dan, da, tan, zha, zhou, cha
  tan tɑ tʼan tʂɑ tʂou tʂʼɑ
- Tun屯 dun, du, den, tun, zhun, chun
  tuən tu tən tuən tʂuən tʂʼuən

Zhou周 diao, tiao, ti, zhou, zhao, chou

tiɑu tʼiɑu t’i tʂou tʂɑu tʂʼou

Similar Initials and Finals

- Di 帝 di, ti, chi

  ti t'i tʂʻʅ
- Finals are V (+high,-round)

- Di 氐 Di, de, zhi, chi

  ti tɤ tʂʅ tʂʻʅ
- Finals are V (-round).

Similar Initials and Finals

- Dai 带 dai, zhi

  tai, tʂʅ

- All Finals are V or VV, unround.

- Di （滴） di, zhi, zhe, zhai

  ti, tʂʅ, tʂɤ, tʂɑi

- All Finals are V or VV, unround.

Initials and Finals

- In Chinese characters in Modern Mandarin, initial consonants are forming regular recurring patterns. Finals are also forming their own recurring patterns in the written language.

Overall Patterns: Initials vs. Finals

- Initials
- A
- B
- C
- D

Finals

V

W

X

Y

Overall Patterns:
Segments for
Each Individual Phonetic Series

- Initials-Finals (Segments) for Each Phonetic Series
- A-V
- B-W
- C-X
- D-Y

Implications and Applications

- The phononological patterns of the writing system
- L1 language acquisition
- L2 language acquisition
- Language teaching / Pedagogy
- Psycholinguistics
- Neurolinguistic Processing of Chinese Characters

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谢谢 Xiexie.