Phonemes, Features, and Syllables: Converting Onset and Rime Inventories to Consonants and Vowels

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Some useful concepts

- Two traditions in describing languages; *Fanqie* “冬，都宗切”
- SR vs. UR (Surface representation and underlying representation)
- Phonemic analysis (Chomsky and Halle 1968)
- Syllable structure and features (Ladefoged 2011; Goldsmith 2011)
- CGVX syllable structure

- An in-depth analysis of Lanzhou Chinese to interpret the problems in phonemic analysis and a method to solve them.
- CGVX syllable structure

Onsets in Lanzhou Chinese

- [p p^h m pf pf^h f v t t^h n ts ts^h s z tʂ $tʂ^h$ ʂ ʐ tɕ $tɕ^h$ ɕ ȵ k k^h x]

Phonemic analyses of onsets

- Lanzhou dialect Onsets: p, p^h, m, **pf, pf^h, f, v,** t, t^h, l, n, ɳ, ts, ts^h, s, z, tʂ, $tʂ^h$, ʂ, ʐ, tɕ, $tɕ^h$, ɕ, k, k^h, x;
- Standard Chinese (SC) onsets: p, p^h, m, f, t, t^h, l, n, ts, ts^h, s, tʂ, $tʂ^h$, ʂ, ʐ, tɕ, $tɕ^h$, ɕ, k, k^h, x

Feature analysis of CG combinations

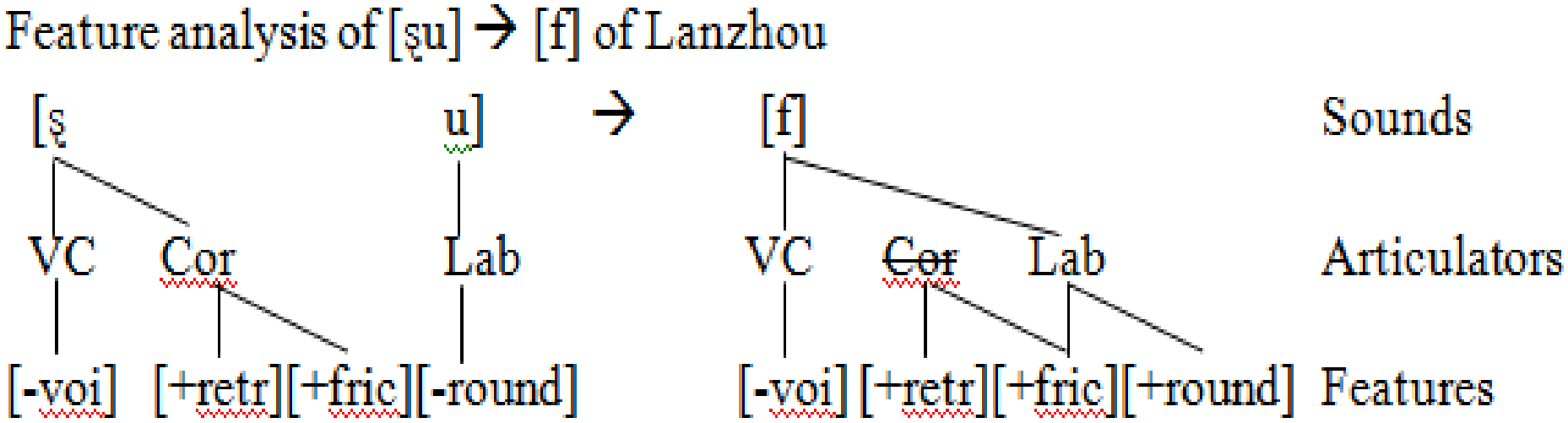
	[j] = Dor	[w] = Lab	[ɥ] = Lab + Dor
Labial	+	-	-
Coronal	+	+	+
Dorsal	-	+	-

C	G=0	G[j]	G[w]	G[q]
pf	+	-	-	-
pf[h]	+	-	-	-
f	+	-	-	-
v	+	-	-	-
ʦ	+	-	-	-
ʦ[h]	+	-	-	-
s	+	-	-	-
z	+	-	-	-

Correspondence between [tʂ, tʂʰ, ʂ, ʐ] vs [pf, pfʰ, f, v]

	L	SC		L	SC		L	SC
珠 'pearl'	pfu	tʂu	初 'beginning'	pfʰu	tʂʰu	书 'book'	fu	ʂu
爪 'paw'	pfa	tʂua	耍 'play'	pfʰa	tʂʰua	说 'speak'	fə	ʂuə
桌 'desk'	pfə	tʂuə	戳 'stab'	pfʰə	tʂʰuə	睡 'sleep'	fei	ʂuei
追 'chase'	pfei	tʂuei	吹 'blow'	pfʰei	tʂʰuei	拴 'tie'	fẽ	ʂuẽ
拽 'pull'	pfɛ	tʂuɛ	揣 'carry'	pfʰuɛ	tʂʰuɛ	帅 'cute'	fɛ	ʂuɛ
专 'focus'	pfẽ	tʂuɐn	川 'small river'	pfʰẽ	tʂʰuɐn	顺 'smooth'	fə̃	ʂun
装 'load'	pfɔ̃	tʂuaŋ	床 'bed'	pfʰɔ̃	tʂʰuaŋ	入 'inward'	vu	ʐu
准 'permit'	pfə̃	tʂun	春 'spring'	pfʰə̃	tʂʰun	软 'soft'	vẽ	ʐuẽ

Feature analysis of [ʂu] → [f] of Lanzhou



Palatalization of Coronals in Lanzhou

- [ts] → [tɕ] / _ [i] or [y]
- [tsʰ] → [tɕʰ] / _ [i] or [y]
- [s] → [ɕ] / _ [i] or [y]
- [n] → [ȵ] / _ [i] or [y]

- Consonants in Lanzhou Chinese (18 in all)
- [p p^h m f t t^h n ts ts^h s z tʂ $tʂ^h$ ʂ ʐ k k^h x]
-
- Non-phonemic onsets in Lanzhou Chinese (7 in all)
- [pf pf^h]realization of [tʂu $tʂ^h$u]
- [v]realization of [ʐu] or syllable-initial [u] (or [w])
- [tɕ $tɕ^h$ ɕ ȵ]palatalized versions of [ts ts^h s n] respectively

Phonemic analyses of rimes

- 1. **Decomposition of rimes**

Rime	[iau]	[ian]	[ia]	[an]
You et al. (1980)	[iau]	[ian]	[ia]	[an]
Lee and Zee (2003)	[iau]	[ia], [n]	[ia]	[a], [n]
Hu (2013)	[i], [au]	[i], [a], [n]	[i], [a]	[a], [n]
Duanmu (2007)	[i], [a], [u]	[i], [a], [n]	[i], [a]	[a], [n]

Rimes in Lanzhou Chinese

- [ɿ ʅ ɯ i u y a ia ua ə iə uə yə ɛ uɛ ɔ iɔ ei uei ou iou ɐ̃ iɐ̃ uɐ̃ yɐ̃ ɔ̃ iɔ̃ uɔ̃ ə̃n ĩn ũn ỹn]

- 2. **Analysis based on phonemic economy**
- [ɛ] = [ai]
- [ɔ] = [au]
- [ɐ] = [a]/_[n]
- [o] = [ə]/_[u]
- [e] = [ə/_[i]
- Vowel phonemes: [i u y a ə]

3. Analysis based on syllable structure

	G=0	G=j	G=w	G=ɥ	
i	[i]	HH	HH	HH	X=0
u	[u]	HH	HH	HH	
y	[y]	HH	HH	HH	
a	[a]	[ia]	[ua]	-	
ə	[ə]	[iə]	[uə]	[yə]	
i	HH	HH	HH	HH	X=i
u	HH	HH	HH	HH	
y	HH	HH	HH	HH	
a	[ɛ]	II	[uɛ]	II	
ə	[ei]	II	[uei]	II	

Constraints on GVX forms

Label	Name	Definition
HH	No [+high]-[+high]	No adjacent [+high] sound are allowed
II	No [i]_[i]	[i] cannot occur in both the medial and the coda
UU	No [u]_[u]	[u] cannot occur in both the medial and the coda

Comparison of two phonemic analyses of Lanzhou Chinese

	Five-vowel analysis	Six-vowel analysis
Vowels	[i u y a ə]	[i u y a ə ɔ]
Consonants	19 (nasals: [m n ŋ])	18 (nasals: [m n])
Basic phonemes	24	24
Marginal phonemes	[z ɯ]	[z ɯ]
Constraints on GVX	HH, II, UU	HH, II, UU
Missing GVX	[ya iŋ uŋ yŋ yaŋ əŋ iəŋ uəŋ yəŋ]	[ya wɔ yɔ ɔi wɔi au iau ɔu iɔu yɔn]

Two analyses of [ɔ] in Lanzhou Chinese

Analysis	Vowels	[ɔ]	[ɔ̃]	[ɛ̃]	Nasal codas
5-vowel	[i u y a ə]	[au]	[aŋ]	[an]	[n ŋ]
6-vowel	[i u y a ɔ ə]	[ɔ]	[ɔn]	[an]	[n]

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THANK YOU!