A theory of cross-category agreement and new evidence for unified place features

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Main Question

To what extent to are the places of articulation of vowels and consonants defined by the same set of phonological features?

- **Unified** feature theories: consonants and vowels are both defined via [lab], [cor], [dor] (Clements & Hume 1995 a.o.)
- **Disjoint** feature theories: consonants are as above, but vowels are [±back], [±round], etc. (Halle, Vaux & Wolfe 2000, Ní Chiosáin & Padgett 1993 a.o.)

Introduction

Processes unique to labial-velar stops [k͡p g͡b] provide evidence for **unified** place features: consonants and vowels **share** major place features [coronal], [dorsal], and [labial].

New definition of Place Agreement proposed:

- Representation based on Clements & Hume 1995
- Cross-category place agreement ignores intermediate C- or V-place nodes; looks for presence of [labial] (e.g.) directly
- Also necessary for faithfulness: cross-category IdentPlace

Background

Vietnamese (and Aghem, see Hyman 1979, Danis 2017) show **cross-category consonant-to-vowel agreement**:

- Roundedness on the vowel causes full consonantal labial closure on the agreeing consonant
- Unattested with simple consonants outside of palatalization (Padgett 2011, Halle, Vaux & Wolfe 2000)

Table 1: Summarized typology of Padgett 2011

Within-category (WC)	Cross-category (XC)
V-to-C (VC) ✓/e/ → [u] / _ w (Kabardian)	✓/ɨ/ → [u] / p, m_ (Mapila Malayalam)
C-to-V (CV) ✓/T/ → [T^{j}] / _ i, e (Russian)	✓/k/ → [tʃ] / _ i (Slovak) */k/ → [p] / _ u (Unattested)

Data

Vietnamese dorsal consonants show restricted distribution in coda position (from Phạm 2006: 115, see also Thompson 1965, Kirby 2011):

(1) a. ʔuk͡p 'Australia' b. *ok
c. ɔŋ͡m 'bee' d. *ak͡p, *ek͡p
e. xɔk͡p 'to cry'

	E	A	O
C	✓	*	*
K	*	✓	*
K͡P	*	*	✓

Table 2: Rhyme restrictions in Vietnamese (summarized from Kang, Phạm & Storme 2016)

Analysis

Cross-Category Agreement

Agree$_X$Place
⟨•$_1$, •$_2$⟩ / (•$_1$ $\mathfrak{R}_{adj}$ •$_2$) ∧ ((•$_1$ ↓ [dor]) ⊕ (•$_2$ ↓ [dor])) +
⟨•$_1$, •$_2$⟩ / (•$_1$ $\mathfrak{R}_{adj}$ •$_2$) ∧ ((•$_1$ ↓ [lab]) ⊕ (•$_2$ ↓ [lab])) +
⟨•$_1$, •$_2$⟩ / (•$_1$ $\mathfrak{R}_{adj}$ •$_2$) ∧ ((•$_1$ ↓ [cor]) ⊕ (•$_2$ ↓ [cor]))
—
"Assign a violation for each pair of adjacent segments ⟨•$_1$, •$_2$⟩ that have a disparity in dorsal place, and for each with a disparity in labial place, and for each with a disparity in coronal place *anywhere in the geometry*."
• = root node, ↓ = *general* dominance

Both [ok^{w}] and [ok͡p] satisfy Agree$_X$Place; V-place markedness rules out [ok^{w}] (see supplement or Danis 2017 for full constraint set and ranking)

/ok/	Agree$_X$Place	Agree$_C$Place	Agree$_V$Place	•$_1$ place	•$_2$ place
a. ok	*	*	**	V-Pl ↓ [lab], V-Pl ↓ [dor]	C-Pl ↓ [dor]
b. ok^{w}		*	*	V-Pl ↓ [lab], V-Pl ↓ [dor]	C-Pl ↓ [dor], V-Pl ↓ [lab]
c. ok͡p		**	**	V-Pl ↓ [lab], V-Pl ↓ [dor]	C-Pl ↓ [lab], C-Pl ↓ [dor]

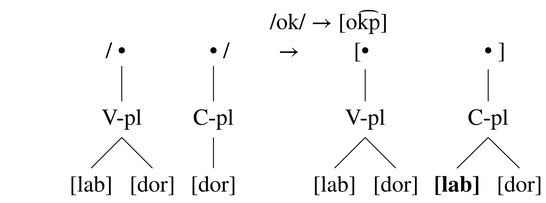

Figure 1: Dorsal [k] sprouts a labial C-place feature to agree with labial V-place feature on round vowel [o]

Discussion

Pattern best captured with **unified** place features. Assuming disjoint features:

- Under a spreading analysis, [round] cannot spread to become [labial] without additional restructuring rules
- Under an agreement (feature-changing) analysis, a constraint can be formulated, but there is a missed parallelism between Agree$_X$Place and an isomorphic faithfulness constraint Ident$_X$Place

Ident$_X$Place:

- Operates over input/output correspondence $\mathfrak{R}_{io}$.
- Necessary to capture place demotion in Mumuye, Noni: /k͡p/ → [k^{ʷ}] (labial C-place in the input is realized as labial V-place in the output)

Table 3: Cross-category faithfulness allows place demotion in /k͡p/

input	winner	loser	*KPT$_C$	*K$_V$	Ident$_X$Place	Ident$_C$Place	Ident$_V$Place	*P$_V$	*KP$_C$
a. /k͡p/	k^{w}	k͡p	W			L	L	L	W
b. /k͡p/	k^{w}	p^{ɣ}		W				L	
c. /k͡p/	k^{w}	k			W		L	L	
d. /k͡p/	k^{w}	p			W		L	L	
e. /k͡p/	k^{w}	t			W	W	L	L	L

Conclusion

- Labial-velars in Vietnamese show cross-category place agreement, providing evidence that vowels and consonants are defined by the same set of place features.
- Agreement analysis is supported by parallel faithfulness processes of place demotion.

References and Acknowledgements

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Clements, G. N. & Elizabeth V. Hume. 1995. The Internal Organization of Speech Sounds. In John Goldsmith, Jason Riggle & Alan C. L. Yu (eds.), *The Handbook of Phonological Theory*. Blackwell Publishing.
Danis, Nick. 2017. *Complex Place and Place Identity*. Rutgers University dissertation.
Halle, Morris, Bert Vaux & Andrew Wolfe. 2000. On Feature Spreading and the Representation of Place of Articulation. *Linguistic Inquiry* 31. 387–444.
Hyman, Larry M. 1979. Part 1: Phonology and Sound Structure. In Larry M. Hyman (ed.), *Aghem Grammatical Stricture* (Southern California Occasional Papers in Linguistics 7). Los Angeles: University of Southern California.
Kang, Yoonjung, Andrea Hòa Phạm & Benjamin Storme. 2016. French loanwords in Vietnamese: the role of input language phonotactics and contrast in loanword adaptation. *Proceedings of the Annual Meetings on Phonology* 2.
Kirby, James. 2011. Vietnamese (Hanoi Vietnamese). *Journal of the International Phonetic Association* 41(3). 381–92.
Ní Chiosáin, Máire & Jaye Padgett. 1993. Inherent VPlace. Report LRC-93-09, Linguistics Research Center, University of California, Santa Cruz.
Padgett, Jaye. 2011. Consonant-Vowel Place Feature Interactions. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume & Keren Rice (eds.), *The Blackwell Companion to Phonology*, vol. 3, 1761–1786. Wiley-Blackwell.
Phạm, Andrea Hòa. 2006. Vietnamese Rhyme. *Southwest Journal of Linguistics* 25(2). 107–141.
Thompson, Laurence C. 1965. *A Vietnamese Reference Grammar*. Honolulu, HI: University of Hawai'i.