Locality, neutrality, and contrast:
A new resolution to the Votic paradox

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Outline

1   Introduction

1.1   The language

Votic (also Vod, Votian; endonym *Vaďďa tšeeli* or *Vaďďa ceeli*; ISO-639 code `vot`):

Figure 1: *Location of Votic*

- Uralic ▸ Finno-Ugric ▸ Finnic ▸ Votic

- Spoken in western Russia (four villages in Leningrad Oblast; Kuznetsova et al. 2015: 135)

- "The total number of Votic speakers now could be 6 to 10" (Heinsoo & Kuusk 2011: 172).

- "At present, Votic is almost never used as a means of communication" (Kuznetsova et al. 2015: 137).

1.2   The paradox

The Votic paradox, identified by Blumenfeld & Toivonen (2016):

- /i/ is transparent to vowel place harmony (as in Finnish).
  - ☞ This suggests that /i/ **is not** specified for place.
- But /i/ conditions a front allophone of /l/.
  - ☞ This suggests that /i/ **is** specified for place.

Blumenfeld & Toivonen's solution:

- Place is specified on /i/, but it is not contrastive.

- Non-contrastive features are 'weak,' and sometimes ignored (Calabrese 1995; Nevins 2010; Rhodes 2010).

- Harmony applies only to contrastive specifications.

- /l/ allophony is sensitive to all specifications.

My proposal:

- Place is contrastive on /i/ in Votic…

- …but it is marked by a different feature from the one that participates in vowel harmony.

2 *The paradox illustrated*

2.1 Harmony

Front–back vowel pairs participate in place harmony, which propagates from left to right:

(1)   Front stem + ELATIVE /-ssA/ (Ahlqvist 1856; Ariste 1968)

    a. ylee-ssæ   'cream'

    b. sømæ-ssæ   'eating'

    c. vævy-ssæ   'son-in-law'

    d. sepæ-ssæ   'smith'

(2)   Back stem + ELATIVE /-ssA/ (Ariste 1968)

    a. udu-ssɑ   'fog'

    b. vɘrkko-ssɑ   'net'

    c. roopɑ-ssɑ   'porridge'

    d. vɑsɑrɑ-ssɑ   'hammer'

	FRONT	BACK
HIGH RD	y	u
MID RD	ø	o
MID UNRD	e	ɘ
LOW UNRD	æ	ɑ

Table 1: *Harmonizing vowel pairs*

/i/, which has no native back counterpart, is transparent to harmony (data from Ahlqvist 1856; Ariste 1968):

(3)   /i/ in front stems + ELATIVE /-ssA/

    a. izæ-ssæ   'father'

    b. tæi-ssæ   'louse'

    c. pehmiæ-ssæ   'soft'

(4)   /i/ in back stems + ELATIVE /-ssA/

    a. siłłɑ-ssɑ   'bridge, floor'

    b. poiɡɑ-ssɑ   'boy, son'

    c. vɘttimɘ-ssɑ 'key'

(5)   Front stem + PL. /-i/ + ELATIVE /-ssA/

    a. tʃivæ-i-ssæ 'stones'

    b. seemen-i-ssæ 'seeds'

    c. lyhy-i-ssæ   'short'

(6)   Back stem + PL. /-i/ + ELATIVE /-ssA/

    a. su-i-ssɑ   'mouths'

    b. ɑmpɑ-i-ssɑ 'teeth'

    c. lintu-i-ssɑ 'birds'

One obvious way to account for this would be to say that frontness is simply not specified on /i/ at all.

2.2 /l/ allophony

But Blumenfeld & Toivonen (2016) show that the frontness of /i/ must be phonologically specified.
The lateral /l/ is normally clear [l] in words with front vowels and velarized [ł] in words with back vowels:[1]

(7)   [l] in front-harmonic words (Ariste 1968)

    a. leppæ   'alder'

    b. elæ: 'to live'

    c. ellytæn   'I pamper'

    d. miltinle:b̥ 'some kind of'

    e. tʃylæ-llæ 'village' + ADESSIVE

(8)   [ł] in back-harmonic words (Ariste 1968)

    a. ɘłud̥   'beer'

    b. xɑ:mołɑin 'devil'

    c. pɘłłɘłɘ-ssɑ: 'field' + TERMINATIVE

    d. miłtɑ   'from me' (1SG.ABL.)

    e. poiɡɑ-łłɑ 'boy, son' + ADESSIVE

Before /i/, however, even in an otherwise back-harmonic word, /l/ is clear [l]:

(9)   [l] before /i/ in back-harmonic words (Blumenfeld & Toivonen 2016: 1171; Ariste 1968)

    a. ɘlimmɑ   'we were'   c. tuli-i-sɘ: 'fire' + PL. + ILLATIVE

    b. tɑppɘlikko 'combative person'   d. lintu-i-łɑ   'bird' + PL. + ALLATIVE

So the frontness of /i/ is phonologically active.[2]

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1. [ł] contrasts with palatal(ized) [ʎ] or [lʲ]; see Blumenfeld & Toivonen (2016: 1170) for discussion.

2. Forms like (8d) show that velarization of /l/ does not require an immediately following [+back] vowel (*pace* Černjavskij n.d.: 6).

2.3   /k/ palatalization

Further relevant evidence comes a pattern described by Odden (2005: 100–101).

The unrounded mid vowels /e/ and /ɘ/ raise (and front) to [i] word-finally:

(10)   Underlying /i/: No alternation

	PARTITIVE	NOMINATIVE	
a.	si:li-æ	si:li	'hedgehog'
b.	łusti-ɑ	łusti	'pretty'

(11)   Underlying mid vowel: Final raising/fronting

	PARTITIVE	NOMINATIVE	
a.	tʃive-æ	tʃivi	'stone'
b.	jɑrvɘ-ɑ	jɑrvi	'lake'

The [i] created by raising palatalizes a preceding /k/ to [tʃ]:

(12)

	PARTITIVE	NOMINATIVE	
a.	kurkɘ-ɑ	kurtʃi	'stork'
b.	ɘłkɘ-ɑ	ɘłtʃi	'straw'
c.	kɑhkɘ-ɑ	kɑhtʃi	'birch'

Here, the frontness is both imposed on the vowel by a phonological process and transmitted from the vowel to the consonant.

3   *Theoretical questions*

3.1   **Blumenfeld & Toivonen's account**

Blumenfeld & Toivonen (2016) propose to resolve the paradox as follows:

- /i/ is specified as [−back], like other front vowels in Votic.

- This feature can spread from /i/ to /l/.

- But the specification is 'weak' (Rhodes 2010), because it is not contrastive, because /i/ has no native phonemic [+back] counterpart.

- Harmony applies only to 'strong' (contrastive) specifications for [±back].

- Blumenfeld & Toivonen show that Span Theory (McCarthy 2004; O'Keefe 2007) can't cope with /i/; their account is formulated in Agreement By Correspondence (Hansson 2001; Rose & Walker 2004).

3.2   **How should locality be relativized?**

Blumenfeld & Toivonen (2016: 1168): "Votic harmony is incompatible with strictly local theories." Rhodes's (2010) feature strength makes it possible to distinguish two degrees of relativization:

(13)   a. Harmony applies to segments within a contiguous domain.
       b. Harmony applies to segments **specified for the harmonizing feature** within a contiguous domain.
       c. Harmony applies to segments ***contrastively* specified for the harmonizing feature** within a contiguous domain.

As in Calabrese (1995) and Nevins (2010):

- Both contrastive and non-contrastive features are specified, but they do not have equal status.

- Some patterns (like harmony) are sensitive only to contrastive feature values;

- others (like /l/ allophony) are sensitive to all feature values.

3.3   What is the role of contrast?

But what if we want to pursue the hypothesis that *only* contrastive features are specified (Steriade 1987; Mackenzie & Dresher 2004; Dresher 2009; Hall 2007, 2011; etc.)—i.e., that conditions (13b) and (13c) are necessarily identical?

- This has consequences for how we identify contrastive features (Archangeli 1988; Dresher 2009: ch. 2).

  - The existence of a minimally different segment (e.g., /ɨ/ as a minimal [+back] counterpart to /i/) is a **sufficient** condition for a feature to be contrastive, but not a **necessary** one.

  - Archangeli (1988) shows that relying on minimal pairs will not consistently produce an adequate set of 'contrastive' specifications.

  - Dresher (2009) argues that contrastive features should instead be identified by successive division of the inventory.

  - When multiple features potentially distinguish two segments, the features' relative scope in the contrastive hierarchy determines which one(s) will actually be specified.
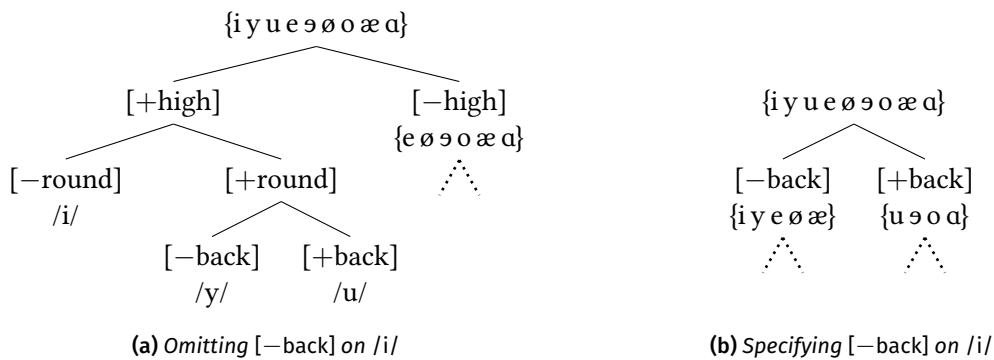

(a) *Omitting* [−back] *on* /i/   (b) *Specifying* [−back] *on* /i/

Figure 2: *Two partial contrastive hierarchies for the inventory* {i y u e ø ɘ o æ ɑ}

- As Nevins (2015: 59–60, 63) points out, the behaviour of /i/ in Votic looks like an "Oops, I Need That" problem for the Contrastivity-Only approach:

  - If we give [±back] narrow enough scope that it is not specified on /i/ (Figure 2a), we can't account for the /l/ pattern.

  - If we give [±back] wide enough scope that it is contrastively specified on /i/ (Figure 2b), we can't account for the transparency of /i/ to harmony.

Does this mean that we need to say (with Blumenfeld & Toivonen 2016; Rhodes 2010; Calabrese 1995; Nevins 2010, 2015) that contrastive features are special, but redundant features can sometimes be active, too?

4   *The contrastive status of* /i/

If the frontness of /i/ is phonologically active (as it seems to be in /l/ allophony), the Contrastivity-Only hypothesis predicts that it must be contrastive.

It is. Table 2 shows the complete vowel inventory (adapted from Ariste 1968: 1), which includes /ɨ/.

- /ɨ/ occurs only in Russian loanwords (Ariste 1968: 1; Blumenfeld & Toivonen 2016: 1169 fn. 2).

	FRONT		BACK	
	UNRD	RD	UNRD	RD
HIGH	i	y	ɨ	u
MID	e	ø	ɘ	o
LOW	æ		ɑ	

Table 2: *All the vowels of Votic*

- But loans are "well assimilated to Votic phonological and morphological patterns" (Harms 1987: 382).

  (14)   Russian borrowing inflected with harmonizing native suffix (Harms 1987: 382; Ariste 1968: 1)
         rɨnko-i-ɫɫɑ 'marketplace'+PL.+ADESSIVE (< Russian *рынок* /ˈrɨnok/ [ˈrɨnək] 'marketplace')

- We could say that borrowings from Russian are lexical exceptions to a high-ranking constraint against unrounded high back vowels.

- Even so, there needs to be a lexical contrast between /i/ and /ɨ/, because they can co-occur within a loanword:

  (15)   [vɨʃifkɑ] 'embroidery' (Ariste 1968: 1; < Russian *вышивка* /ˈvɨʂivka/ [ˈvɨʂifkə] 'embroidery')

This means that if the specification of frontness on /i/ is 'weak' in Votic, then this weakness follows from something less straightforward than a categorical lack of contrast between /i/ and /ɨ/.

- Blumenfeld & Toivonen (2016: 1176) "loosely" identify feature strength with functional load (but go on to offer a formal definition in terms of minimally contrasting segments).

- We might also consider gradient degrees of contrastiveness (Hall 2009, 2013):

  - non-contrastive   →   unspecified
  - marginally contrastive   →   weakly specified
  - 'fully' contrastive   →   strongly specified

  Hall (2009) proposes a way of quantifying contrastiveness, but also points out that there are no clear criteria for drawing a line between marginal and non-marginal contrasts.

5   Proposal: A new resolution to the paradox

5.1   Feature specifications

The feature that (contrastively) marks frontness on /i/ is not the same feature that is involved in harmony. Specifically:

- The frontness of /i/ is encoded by the place feature CORONAL.[3]

- All other vowels are marked for [±back], which harmonizes.

In the contrastive hierarchy:

- CORONAL must have wider scope than [±back], so that [−back] isn't specified on /i/.

- [±back] must have wide enough scope that it will be specified on /ɨ/, even though /ɨ/ has no minimally different [−back] counterpart in the non-CORONAL subinventory.

  (Figure 3 shows [±back] as the second division, immediately following CORONAL; what's crucial is that [±back] takes scope over at least one of [±high] and [±round].)
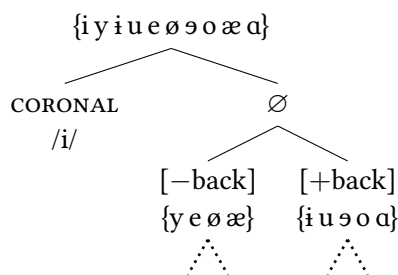

Figure 3: *Partial contrastive hierarchy for Votic*

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3. I'm treating CORONAL as monovalent (Clements & Hume 1995: 252), but this is not crucial.

5.2   Processes

Harmony: Harmony spreads [±back] to vowels with an underlying specification for this feature (or, in OT terms, harmony requires all vowels specified for [±back] to agree).

/l/ allophony: Harmonic [+back] spreads to /l/ as a secondary articulation, but this is overridden by an immediately following CORONAL vowel. (I.e., place agreement between /l/ and /i/ {follows/outranks} propagation of [+back] to /l/.)

/k/ palatalization: Non-low unrounded vowels become CORONAL word-finally; derived /i/ spreads coronality to palatalize a preceding /k/.

5.3   Phonetic corroboration

Phonologically, the motivation for representing CORONAL /i/ differently from [−back] /y e ø æ/ is that the frontness of /i/ interacts only with consonants, while [±back] is the feature that harmonizes on vowels.

But is it phonetically plausible to say that /i/ is CORONAL and other front vowels are not?

(Assumption: Substance use in moderation (Hall 2014; Dresher 2014). Phonological features do not have rigidly defined universal phonetic boundaries, but are also not wholly abstract and devoid of phonetic content.)

- Not much phonetic work on Votic is available.

- Ahlqvist (1856) and Ariste (1968) describe the vowels as similar to their Estonian counterparts (except for /ɨ/, which doesn't have one).

- Estonian /i/ is articulated notably farther forward than the other front vowels, including its nearest rounded counterpart /y/ (Asu & Teras 2009: 368).

- If this is also true in Votic, it is plausible (though not inevitable) that /i/ bears a feature marking a degree of coronal constriction that other vowels lack.

- Černjavskij (n.d.: 8) suggests that intervocalic /i/ in Votic can be realized as [dʲː] (but does not give details).

6   *Consequences*

If this analysis is on the right track, then the transparency of /i/ to Votic vowel harmony cannot be attributed to an absence of contrast with /ɨ/.

- This proposal is consistent with the strong claim that a feature must be contrastive to be phonologically active—what Nevins (2015) calls the Contrastivity-Only Hypothesis:

  - The ability of /i/ to palatalize /k/ and override velarization of /l/ depends on the fact that the feature CORONAL distinguishes it from the other Votic vowels.
  - The transparency of /i/ to harmony follows from the fact that [−back] is redundant if /i/ is already specified as CORONAL.

- There are actually other cases in Votic of vowels with harmonic counterparts exhibiting some form of neutrality (Ariste 1968; Blumenfeld & Toivonen 2016):

  - /o/ can follow front vowels (causing harmonizing vowels to its right to be back); in fact, /ø/ is rare in non-initial syllables, occurring mostly in loanwords from Finnish or Ingrian (Ariste 1968: 5).
  - There are some transparent instances of /e/.

- Harmony applies straightforwardly to all vowels specified for [±back] (modulo the exceptions with /o/ and /e/), rather than skipping over 'weak' instances of [−back]: it is subject to normal conditions of relativized locality, without reference to the metafeatural property of strength.

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