The Cross-Linguistic Phonological and Phonetic Identity of /v/
Russian /v/ patterns anomalously

Like voiced obstruents:

/v/ ⇒ [f] / {__, #, __T}

- Undergoes final devoicing
  [prav-a] ~ [praf], right (fem./masc.)
- Undergoes regressive voicing assimilation
  /v supe/ > [f supe], *in the soup

Unlike voiced obstruents:

/T/ → [D] / __v

- Does not trigger regressive voicing assimilation
  /ot-vesti/ > [otvesti], lead away *[odvesti]
Russian /v/ in a (cross-)linguistic context

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<thead>
<tr>
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<th>Final Devoicing</th>
<th>RVA Target</th>
<th>RVA Trigger</th>
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<tr>
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<td>✓</td>
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</tr>
<tr>
<td>Bulgarian</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Slovak</td>
<td>/v/ → [w]</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hungarian</td>
<td>N/A</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
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Russian /v/ in a (cross-)linguistic context

## Languages with ambiguous patterning of /v/ (non-exhaustive)

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## Linguists on /v/ (non-exhaustive)

What people have said about ambiguous /v/

1. It’s special
2. It’s intermediate between obstruents and sonorants
Ambiguity ⇔ Sonority

“...the Standard Russian V ...occupies an obviously intermediate position between the obstruents and the sonorants”

– Jakobson (1978)
Ambiguity \Leftrightarrow\ Sonority

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Ambiguous /v/ is:

- actually underlying /w/ (Hayes, 1984)
- of sonority 3; triggers \( \leq 2 \); targets \( \leq 3 \) (Barkai and Horvath, 1978)
- actually /\tilde{v}/ = [-wide, +sonorant] (Padgett, 2002)
- gets classified with sonorants by Contrastive Hierarchy (Hall, 2003)
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Language-specific rule/representation/feature/contrast used to account for anomalous sonority of ambiguous /v/.
Question: Do we have beets?

1. Is ambiguous /v/ special?
   - Typology of patterning \(\Rightarrow\) Case studies
   - Typology of inventory structure \(\Rightarrow\) Database study

2. Is ambiguous /v/ intermediate? \(\Rightarrow\) Acoustic study
Acoustic study
Padgett (2002) on ambiguous /v/

Patterning of ambiguous /v/ derives from its *intermediate phonetic nature* together with a cue-based approach to phonology.

**Assumption: phonological identity ⇔ phonetic realization**

<table>
<thead>
<tr>
<th>obstruent</th>
<th>ambiguous</th>
<th>sonorant</th>
</tr>
</thead>
<tbody>
<tr>
<td>v</td>
<td>v</td>
<td>u</td>
</tr>
</tbody>
</table>

/v/ “unstable”

- prone to devoicing
- only realized as [v̥] in positions of perceptual salience (i.e., pre-sonorant)
To adequately test whether ambiguous /v/ is intermediate (1) across languages and (2) within inventory, must use control cases:

1. Control languages:
   - Greek: obstruent distribution; triggers RVA
     /tis varvaras/ → [tiz varvaras]  Barbara’s
   - Serbian: sonorant distribution; neither triggers nor targets RVA
     [ovca] sheep  [svariti] digest

2. Control segments:
   - /f/ ← voiceless member of “pair”
   - /s, z/ ← uncontroversial obstruent fricative pair
   - /m/ ← sonorant (sanity check)
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   - /s, z/ $\leftarrow$ uncontroversial obstruent fricative pair
   - /m/ $\leftarrow$ sonorant (sanity check)

3. **Control for local inventory structure:** all three languages lack labial approximant (e.g., /w, v/)
If we want to find [$v$], need to look in favourable positions:

- word-initial stressed (WIS)
- word-medial unstressed (WMU)
- flanking vowels /a, o/ (no palatalization, spirantization)
- $C_1VC_2V(C)$
Assessing intermediacy of /v/ tokens

Question:
Modulo the effect of voicing, are tokens of voiced and voiceless fricatives realized with similar degree of frication?

Spectral Centroid
Measure of how high frequencies in spectrum are on average (Boersma and Weenink, 2011).

Voicing and frication
Voicing introduces low frequency energy and “multimodal” distribution of frequency ⇒ can’t interpret centroid of voiced fricative!

solution:
high-pass filtered at 1500Hz ⇒ remove effect of voicing
Assessing degree of frication in /v/ tokens

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Assessing degree of frication in /ν/ tokens

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  - can’t interpret centroid of voiced fricative!

- **solution:** high-pass filtered at 1500Hz
  - remove effect of voicing
Assessing frication relationally

**Normalization**

For each speaker \( s \),

- \( \mu_{[f],s} = \) mean centroid value for utterances of \([f]\), averaged across words and repetitions of that speaker

For each centroid \( c_i \) of speaker \( s \), the *relative* measure \( \tilde{c}_i \) is

\[ c_i - \mu_{[f],s} \]

\( \Rightarrow \) \( \tilde{c}_i \) denotes *relative* difference of centroids of \([v, s, z, m]\) to \([f]\)

**Prediction: phonological pairing \( \Leftrightarrow \) phonetic pairing**

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<thead>
<tr>
<th></th>
<th>Greek</th>
<th>Russian</th>
<th>Serbian</th>
</tr>
</thead>
<tbody>
<tr>
<td>( v - f )</td>
<td>( v' - f )</td>
<td>( v - f )</td>
<td></td>
</tr>
<tr>
<td>small</td>
<td>medium</td>
<td>large</td>
<td></td>
</tr>
</tbody>
</table>
Results: relativized spectral centroid

Relative Spectral Centroid: WI Condition

<table>
<thead>
<tr>
<th>Language</th>
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<th>f</th>
<th>ζ</th>
<th>s</th>
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Note that no tokens of /v/ exhibited significant devoicing in any language.
Results: relativized spectral centroid

Note that no tokens of /v/ exhibited significant devoicing in any language.
Ambiguous /v/ is not intermediate.
Why do linguists think that ambiguous /ν/ is special?

Apparent assumptions

- /b, z/ → [p, s]; /p, s/ → [b, z]
- /ν/ : /f/ :: /b, z/ : /p, s/
- Feature that captures this most elegantly is [-sonorant]; disprefer disjunctions
- /ν/ is a fricative, so it ought to pattern with other fricatives
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Question

Do we have *phonological evidence* that the voicing relationships between the stops, sibilants and non-sibilant fricatives are the same?
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- /v/ is a fricative, so it ought to pattern with other fricatives

Question
Do we have phonological evidence that the voicing relationships between the stops, sibilants and spirants are the same?

Definition
Spirants: non-sibilant fricatives; e.g., /f, θ, x/ vs. /β, ν, ð, y/
Voiced spirants in voicing assimilation

<table>
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<th>Classes of obstruents</th>
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<tr>
<td><strong>Manner</strong></td>
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Conjecture: Voiced spirants cannot trigger obstruent voicing assimilation. If voiced spirants trigger voicing assimilation, sonorants do too.
Voiced spirants in voicing assimilation

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<tr>
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<td>p, t, k</td>
<td>b, d, g</td>
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<tr>
<td>Sibilants</td>
<td>s, ʃ, ʒ</td>
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<tr>
<td>Spirants (voiceless)</td>
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<td>✓</td>
</tr>
<tr>
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<td>β, v, ð, ɣ</td>
<td>✓</td>
<td>?</td>
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### Conjecture

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Pulling a “de Lacy”...

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<th>Pronunciation</th>
<th>English Translation</th>
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<tbody>
<tr>
<td>/tous barbaðes/</td>
<td>[touz barbaðes]</td>
<td>the uncles, acc.</td>
</tr>
<tr>
<td>/tis ðino/</td>
<td>[tiz ðino]</td>
<td>I give her</td>
</tr>
<tr>
<td>/tis varvaras/</td>
<td>[tiz varvaras]</td>
<td>Barbara’s</td>
</tr>
<tr>
<td>/tis mamas/</td>
<td>[tiz mamas]</td>
<td>the mother’s</td>
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[eβylotos] ‘eloquent’ ∼ [efstaθia] ‘steadiness’ (same prefix)

**Implication:** Greek exhibits RVA, but *not* OVA

⇒ Greek /v/ is not a trigger of OVA

⇒ phonological pairing of /f, v/ in Greek reflected in the phonotactics, but evidence is lacking in active phonology
In search of /v/ = [-sonorant, +voice] as a trigger for OVA
In search of $/v/$ = [-sonorant, +voice] as a trigger for OVA

What about…

- **Czech?** In some dialects, ambiguous $/v/$; in others, $/tv/ \rightarrow [tf]$ (Hall, 2003)
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  Why is this so hard???

- **Polish?** In Krakow dialect, sonorants also cause voicing; in Warsaw dialect? Conflicting reports
Question

Is there a language in which /\nu/ patterns as an obstruent with respect to voicing assimilation, to the exclusion of the sonorants?
It's not ambiguous /v/ that's special.

It's /v/ that's special.
It’s not ambiguous /v/ that’s special

It’s the voiced (non-sibilant) spirants that are special.
Beets everywhere!

Claim

There is no such thing as “ambiguous /v/” as a special kind of entity, either phonologically or phonetically. Voiced spirants cannot be triggers of obstruent voicing assimilation. Whatever is special about “ambiguous /v/”, namely, some kind of intermediacy on the sonority scale, is special about all voiced spirants.
Other sources of evidence

Phonetic basis
Phonetically, voicing and frication (especially non-sibilant) are difficult to maintain for aerodynamic reasons (Ohala, 1983).

Typological evidence
- Botma and van’t Veer (2013) argue, based on typological data and patterning, that voiced spirants are really sonorants; they focus mainly on /β, ð, ɣ/, but do include /v/ as well.
- My own database investigations corroborate their conclusions, but also suggest that contrast may have an important role to play.
Current and future research

- Polish... *(Anyone got a student looking for a project?)*
Current and future research

- Polish. . . *(Anyone got a student looking for a project?)*
- If voiced spirants are truly on the boundary between sonorants and obstruents, what’s their contrastive status on either side of the boundary?
  - There are no examples of /β, δ, ϒ/ contrasting with approximants in the database
  - There are 132/571 examples of /v/ contrasting with /w/, and 13 examples of /v/ contrasting with /u/
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  - There are 132/571 examples of /v/ contrasting with /w/, and 13 examples of /v/ contrasting with /u/
- Do voiced spirants pattern as voiced obstruents for different (non-RVA-triggering) phenomena?
Thank you!

Special thanks to Adam Bjoerndahl, Jaye Padgett, Rafael Stern, Robin Karlin and Ewan Dunbar for helpful discussion and correspondence, and to Amanda Rysling and Slawomir Zdziebko for their confirmation that Polish is hard.


