

There is no problem of /v/ in Russian phonology

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1 The problem of /v/

1.1 The basic problem

{v*} functions as a sonorant if followed by a sonorant, and as an obstruent if followed by an obstruent' (Halle 1959, p. 63)

- | | | | | |
|-----|----|-------------|---------|-----------------|
| (1) | a. | [zovə] | зова | 'call-GEN.SG' |
| | b. | [zof] | зоб | 'call' |
| (2) | a. | [bʲitvə] | битва | 'battle' |
| | b. | [podvʲik] | подви́з | 'feat' |
| (3) | a. | [pʲivʲjɛfs] | певец | 'singer' |
| | b. | [pʲiffsa] | певица | 'singer-GEN.SG' |

- All data is from Modern Standard Russian
- According to (1), /v/ undergoes final devoicing
- So do obstruents

- | | | | | |
|-----|----|--------|------|----------------|
| (4) | a. | [zobə] | зоба | 'crawl-GEN.SG' |
| | b. | [zop] | зоб | 'crawl' |

- According to (2), /v/ does not trigger voicing assimilation
- Neither do sonorants

- (5) a. [brak] брак 'marriage'
 b. [prax] прах 'ashes'
- According to (3), /v/ undergoes voicing assimilation
 - So do obstruents
- (6) a. [rubʲeʃʲ] рубец 'scar'
 b. [rupʲʂa] рубца 'scar-GEN.SG'

1.2 Transparency of sonorants

- Jakobson (1978): sonorants are transparent to voicing assimilation

- (7) a. [ɐt#ozʲɪrə] от озера 'from a lake'
 b. [ɐt#lɔʲkʲɪ] от ложки 'from a spoon'
 c. [ɐd#lɡuna] от лгуна 'from a liar'

- Sonorants do not trigger assimilation, so the voicing in (7c) must be due to the [g]

1.3 Transparency of /v/

„Falls ein Geräuschlaut einem stimmhaften Geräuschlaut vorangeht, so wird auch der erste von den beiden stimmhaft, gleichgültig ob die beiden unmittelbar nacheinanderfolgen oder zwischen ihnen ein einfaches oder langes, hartes oder weiches *v* auftritt.“ (Jakobson 1956)

- (8) a. [k#ozʲɪrʊ] к озеру 'to a lake'
 b. [g#dʲerʲɪvʊ] к дереву 'to a tree'
 c. [k#vorənu] к ворону 'to a raven'
 d. [g#vdʲe'vʲe] к вдове 'to a widow'

'Everything transpires as if {v} or {v,} had been absent' (Halle 1959, p. 64)

- In (8d), the assimilation cannot be triggered by [v], contrast (8c)

1.4 Devoicing of /v/

- (9) a. [vʲi-xat] выход 'exit'
 b. [f-xot] вход 'entrance'
 c. [is#fxodə] из входа 'from an entrance'

- Here, /v/ → [f] creates a trigger of devoicing

2 Proposed solutions

2.1 The basic idea

- The problem:
 1. [v] behaves as if it lacked [+voice] when voicing assimilation applies
 2. [v] can get [−voice] from voicing assimilation
 3. The product of [v] → [f] behaves as if it has [−voice] by triggering assimilation
- The solution: assign [±voice] to [v] during the derivation

2.2 What is the /v/ underlyingly?

- Since the behaviour of /v/ resembles that of sonorants, it shares some featural property with them
- Options:
 - /ʋ/ (Lightner 1972)
 - /w/ (e. g. Coats & Harshenin 1971, Hayes 1984, Kiparsky 1985)
 - /ʋ/ ‘narrow approximant’, or other non-glide (e. g. Panov 1967, Padgett 2002)
 - /V/ underspecified for [±voice] (Hall 2004, Reiss 2017)

2.3 Derivational accounts

- A representative account is by Kiparsky (1985)
- ☞ Capitals indicate lack of [±voice] specification

Rule	/zoW/	/zob/	/K#WoroNu/	/iz#WKuSa/	/LguN/
Lexical phonology					
Final devoicing		zop			
Default voicing			k#WoroNu	is#Wkusa	
Postlexical phonology					
Final devoicing	zow				
Voicing assimilation			—	is#wkusa	
Default voicing			k#woronu		lgun
/w/ strengthening	zof		k#voronu	is#fkusa	

- In the lexical phonology, all voicing-related rules are only relevant for obstruents due to Structure Preservation
- In the postlexical phonology, they apply to both sonorants and obstruents
- /v/ agrees with sonorants in failing to trigger voicing assimilation, because like sonorants it has not yet received [+voice] at the relevant stage

2.4 Other accounts

- Padgett (2002): Russian /v/ is featurally [+sonorant –wide]
 - As a sonorant, it is able to avoid triggering assimilation
 - The feature [–wide] allows it to be targeted by constraints other than those on other obstruents and sonorants

Common ground

- Russian [v] is not [+voice] underlyingly
- The phonological grammar can make it [±voice]

2.5 Russian /v/ and contrast

- Russian fricatives: /f^(j) v^(j)/, /s^(j) (zj)/, /ʃ ʒ/, /x/
- Minimal contrast for [±voice] (except /x/): why is the /f/–/v/ pair special?
- Solutions:
 - Underlying sonorant (most scholars): solves the contrast problem at the cost of derivational complexity
 - Reiss (2017): rejection of special status for contrast

‘[O]ur study of Russian /v/ [...] shows a segment that does have a contrastive “twin” – there are surface [v]’s and [f]’s – and yet the segment under analysis still behaves in a non-parallel fashion with respect to the feature that determines the contrast [...] Russian shows that lack of contrast with respect to [a feature] F is not a necessary condition to predict irregular behavior with respect to F’ (Reiss 2017, pp. 43–44).

2.6 A proposal

- Russian /v/ and /f/ are *not* ‘contrastive twins’ *anywhere* in the phonological grammar
 - /v/ is /V/ with no underlyingly laryngeal specification, and stays that way
 - ☞ Any devoicing to ‘[f]’ is phonetic implementation
 - /f/ is underlyingly voiceless, and stays that way
 - ☞ Any voicing to ‘[v]’ is phonetic implementation
- This is not a groundbreakingly new idea
- Many scholars have discussed the status of some of the (de)voicing rules applying to [v] as ‘phonetic implementation’
- The proposal is that if we take this seriously, we can establish that there is no ‘problem of /v/’ for a phonological account of Russian

‘When [...] an unpaired obstruent becomes voiced before a voiced obstruent, it does not become identifiable with any other phoneme: just as a voiced realization of *č* remains a *č*, so a voiced *f* remains a *f*.’ (Andersen 1969, p. 126)

3 Russian /v/ (de)voicing is phonetic

3.1 The basic argument

‘I steer clear of the issues of syntax-phonology interface [...] and also of the murky domain of gradient phonetic-y phenomena (including claims that sonorants “optionally and gradiently” devoice word-finally) [...]’ (Reiss 2017, p. 30)

- I do not
- The relationship between categorical and gradient (de)voicing in Russian deserves to be taken seriously
- We cannot assume that gradient processes are phonological
- A modular approach to the division of labour (e. g. Bermúdez-Otero 2012, 2015, Scheer 2015)

‘[P]honologists need to decide whether an alternation falls into the realm of phonological computation *before* they propose a phonological analysis for it’ (Scheer 2015, p. 319)

3.2 Three propositions

- The (de)voicing of sonorants in Russian is phonetic
- ☞ This is relatively uncontroversial, although we have seen that authors such as Hayes (1984), Kiparsky (1985) accomplish this by phonological rule
- The (de)voicing of /v/ in Russian is phonetic in much the same way
- ☞ We need to recognize the phonological repercussions of this position
- There is every reason to suspect that obstruent (de)voicing in Russian is a scattered rule
- ☞ This is a hypothesis for (more) targeted instrumental investigation
- ☞ Like other instances of rule scattering, the Russian situation supports the life cycle model (Bermúdez-Otero 2015)

3.3 Sonorant (de)voicing

- Sonorant devoicing is uncontroversially *possible* in Modern Standard Russian (e. g. Avanesov 1972)

(10) Before voiceless (and devoiced) obstruents

- | | | | |
|----|------------|-------------|----------|
| a. | [sʲer̩p̩] | <i>серб</i> | ‘Serb’ |
| b. | [sʲer̩p̩̥] | <i>серп</i> | ‘sickle’ |

(11) Word-finally, especially after another consonant (Lyubimova 1975)

- | | | | |
|----|-----------|--------------|-----------|
| a. | [mʲɪsʲlʲ] | <i>мысль</i> | ‘thought’ |
| b. | [zʲɪznʲ] | <i>жизнь</i> | ‘life’ |

- In cases such as (11), devoicing competes with vocalization and/or vowel epenthesis to repair sonority sequencing violations (e. g. Knyazev 2004)

- Shevoroshkin (1971): sonorants devoice in cases of transparency

- (12) a. [i \underline{z} #mxa] u3 mxa ‘from moss’
 b. [i \underline{s} # \underline{m} xa]

- Kiparsky (1985) treats it as a variable postlexical rule

- (82) a. i [s $\underline{m\check{c}}$]enska i [z $\underline{m\check{c}}$]enska
 b. o [d \underline{mzd}]y o [t \underline{mzd}]y

- Long disputed (Es'kova 1971, Shapiro 1993, Kavitskaya 1999)
- Disconfirmed experimentally (see Burton & Robblee 1997, Padgett 2012, Kulikov 2013 and cf. Strycharczuk 2012 on analogous Polish data)

‘It seems likely that effects involving sonorants should be handled by the phonetic component. [...] These conclusions essentially remove from the phonology nearly all effects treated as postlexical phonology by Kiparsky (1985).’ (Padgett 2002, p. 6)

We should treat this seriously!

- If we interrogate the phonological status of sonorant (de)voicing, we should apply the same rigour to /v/
 - No good evidence that /v/ (de)voicing is phonological
 - Plenty of suggestive evidence that it is phonetic

3.4 Sonorant and [v] transparency

- Kulikov (2012): no *phonological* [v] transparency to voicing assimilation

- (13) a. [is \underline{f} xodə] u3 vxoda ‘from an entrance’
 b. * [iz \underline{v} xodə]
 c. [ɐt \underline{v} dɛvʲi] om vɔovы ‘from a widow’
 d. [ɐd \underline{v} dɛvʲi] (possible for some speakers in fast speech)

- Similar claim in Paufoshima & Agaronov (1971)
- To the extent there is voicing before the [v], it must be due to the presence of *phonetic* voicing in the [v] and coarticulation with it

3.5 Analysis of transparency

- Sonorant devoicing – and triggering of devoicing by sonorants – is phonetic
 - Variable
 - Sensitive to prosodic boundary strength
 - Comparatively rare

- Voiceless sonorants are not the default case, phonetically
- Voicing of [v] – and triggering of voicing by [v] – is phonetic
 - Variable
 - Sensitive to speech rate
 - Comparatively rare
 - Voiced obstruents are not the default case, phonetically
- ☞ If sonorant (de)voicing can be phonetic, then so can [v] voicing

3.6 The problem of -Cv#

- A [f] ← /v/ by final devoicing is claimed to trigger assimilation variably
- (14)
- | | | | |
|----|-------------|----------------|----------------|
| a. | [trʲɛzvʲij] | <i>трезвый</i> | ‘sober-ATTRIB’ |
| b. | [trʲɛsf] | <i>трезв</i> | ‘sober-PRED’ |
| c. | [trʲɛzf] | | |
- Controversial experimentally
 - Barry (1989) provides the clearest support
 - Kasatkina (2010) is very critical, but still admits the non-assimilated pronunciation is not impossible
 - Zinov’eva (2013) provides evidence that the /v/ is not obligatorily devoiced in these clusters, either
 - Analysis by Padgett (2002)
 - [trʲɛsf] is phonologically /trʲɛzv/ → [trʲɛsf.] with regular cluster devoicing
 - [trʲɛzf] ~ [trʲɛzv] is [trʲɛ.zv̥.] with phonetic devoicing
 - Knyazev (2004): incomplete/variable devoicing in -CC# clusters is not specific to /v/
- (15)
- | | | | |
|----|-----------|---------------|------------------|
| a. | [slʲuzbə] | <i>служба</i> | ‘service’ |
| b. | [slʲuʃp] | <i>служб</i> | ‘service.GEN.PL’ |
| c. | [slʲuzp] | | |
- Consonants mostly realized as partly or fully devoiced but perceived as incompletely voiceless
 - Nothing of the sort in morphologically underived -CC# sequences
- (16)
- | | | | |
|----|---------|--------------|----------------|
| a. | [mozgə] | <i>мозга</i> | ‘brain-GEN.SG’ |
| b. | [mosk] | <i>мозг</i> | ‘brain’ |
| c. | *[mozk] | | |

Analysis by Knyazev (2004)

- Full devoicing in [mosk] is *assimilation* (phonological rule)
- Partial devoicing in [trʲɛzf] and [slʲuzp] is *coarticulation* (phonetic rule)
- Both [trʲɛzf] and [slʲuzp] escape assimilation via a *derived environment effect* (the former has a phonologically derived context, the latter a morphologically derived context)

Proposed analysis

- No phonological evidence for /v/ → [f] in [trʲɛsf] ~ [trʲɛzf]
- Independent evidence for coarticulatory devoicing in derived clusters
- Both [trʲɛsf] and [trʲɛzf] are phonologically [trʲɛzv] with phonetic devoicing

3.7 Behaviour specific to [v]

- Vorontsova (2007), Knyazev, Petrova & Vorontsova (2007) describe the behaviour of [v#v] clusters
 - Expected behaviour
- (17) a. [plof#vʲidəlsʲə] *плов выдался* ‘pilaf turned out’ (word-final devoicing, no assimilation)
- b. [ploʋ#vʲidəlsʲə] (assimilation across word boundaries)
- Knyazev, Petrova & Vorontsova (2007), Vorontsova (2007) find a third option: [f#f]
 - ☞ Or rather [f#ʋ], with devoicing but not complete neutralization

Analysis by Knyazev, Petrova & Vorontsova (2007)

- [f#v] is found across a strong prosodic boundary
- [v#v] is found in the absence of a boundary
- [f#ʋ] is found with weaker boundaries and is an instance of coarticulation

Proposed analysis

- As with [v] ‘transparency’, devoicing instantiates the phonetic tendency for obstruent voicelessness
- ☞ No evidence for phonological devoicing

4 Russian (de)voicing and rule scattering

4.1 Russian [v] and the life cycle

- Are obstruent and [v] (de)voicing handled by the same rule?
- Historically, they are different sound changes
- Two predictions of the life cycle of phonological processes (Bermúdez-Otero 2007, 2015, Bermúdez-Otero & Trousdale 2012)
 - Obstruent and [v] devoicing are different
 - (De)voicing can be a scattered rule

4.2 The history of devoicing

- See any reference, such as Galinskaya (2009)
- ☞ Final devoicing of obstruents follows the fall of the yers
 - Earliest attestations in the 13th century
 - Does not occur in parts of the south-west and in some central dialects (Ukhmýlina 1973)
- ☞ Assimilative voicing: earliest attestations from late 12th century
- ☞ Assimilative devoicing: from late 13th century
 - Voicing and devoicing are not the same change (cf. Ukrainian, which has only the former)

4.3 The devoicing of [w]

- Historically, /v/ is *w
- Often, w remains, possibly vocalizing before a consonant/word-finally (Kasatkin 2013)
- Earliest <f> for *w is from the early 17th century
- When [v] devoices, the outcome can be [x]

(18) stolox] столов ‘table.GEN.PL’

- Russian [f] should not be the contrastive twin of [v] (see already Andersen 1969)

4.4 Russian (de)voicing is scattered

Coexisting rules

- Final devoicing
- Assimilative (de)voicing (may or may not be the same rule)
- Sonorant and [v] (de)voicing
- Reminiscent of *rule scattering* (Cohn 1998, Bermúdez-Otero 2015)
- Coexistence of cognate phonological and phonetic patterns
- ☞ Not classical rule scattering (these processes are related but not produced by the phonologization of a single phonetic pattern)
- Is there evidence for phonetic devoicing of obstruents, too?

4.5 Evidence for scattering in obstruents

- Voicing assimilation across phonological words is arguably phonetic
- Variable, sensitive to boundary strength, not necessarily complete (e. g. Paufoshima & Agaronov 1971, Shapiro 1993, Padgett 2012, Kulikov 2012)

4.6 Further evidence: -Cv# revisited

- Morphologically derived -CC# clusters have the same gradient voicing as -Cv# clusters
- But not underived -CC# clusters

(19) a. [slʌjp] служб ‘service.GEN.PL’
 b. [slʌz̥p]
 c. [trʲes̥f] трезв ‘sober.PRED’
 d. [trʲez̥f]
 e. [mosk] мозг ‘brain’
 f. * [moz̥k]

- In the proposed analysis, the partial devoicing in (19c-d) is phonetic, phonologically the form is [trʲez̥v]
- By parity of reasoning, (19a-b) is [slʌz̥b] with phonetic voicelessness

- What is the difference?
- In (19a), but not in (19e), an empty piece of structure blocks phonological devoicing: [sluzb_]
- The structure is introduced by morphology, explaining the apparent derived environment effect of Knyazev (2004)
- ☞ On such zeros, cf. van Oostendorp (2007), Cavirani & van Oostendorp (2017)

4.7 Conclusion on clusters

- Gradient obstruent (de)voicing exists in Russian alongside phonological obstruent (de)voicing
- Its effects are observed postlexically, and in the rare cases of unassimilated word-level clusters
- Classic case of rule scattering

4.8 Incomplete neutralization?

- If there is gradient obstruent (de)voicing, we need to think about incomplete neutralization
 - Final devoicing (e. g. Pye 1986, Dmitrieva, Jongman & Sereno 2010, Shrager 2012, Kharlamov 2014)
 - Voicing assimilation (e. g. Burton & Robblee 1997, Kulikov 2013)
- Common thread: *voicing* can be neutralized, but *other cues* often aren't
- ☞ Also noted for [v] devoicing by Knyazev (2004)
- Ripe for an investigation acknowledging the possibility of rule scattering

5 Conclusion

5.1 What is the behaviour of Russian /v/?

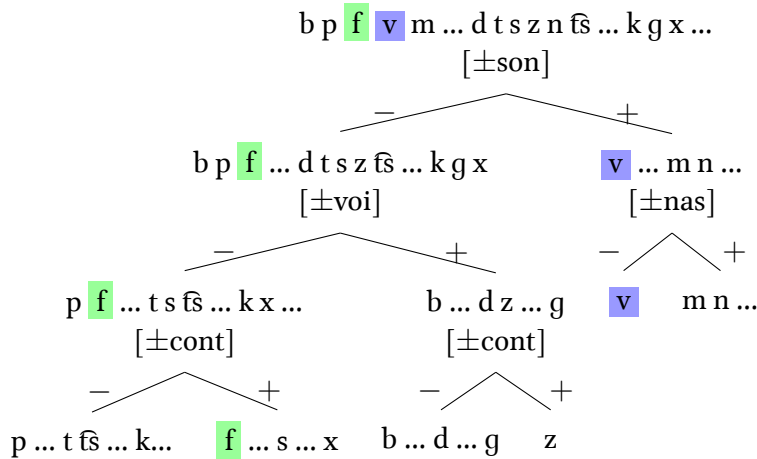
- Padgett (2002) is mostly right: Russian /v/ can be devoiced in the phonetics, just like sonorants
- This being granted, we need *no* recourse to /v/ devoicing in the phonological grammar

5.2 Analysis

- ☞ Russian [f] has no [+voice] counterpart
 - Just like [x], [fʂ] and [fʃ]
- ☞ Russian [v] has no [–voice] counterpart
 - Just like [m], [n], [l]...
 - There is *no* evidence that [v] and [f] are distinguished by [\pm voice] in the phonology
 - To the extent they show parallel (de)voicing patterns, this is *entirely* due to *phonetic* processes

5.3 [v] in the contrastive hierarchy

- See most recently Dresher & Hall (2016)
- Use your favourite feature theory here...



- ☞ [v] is not a contrastive twin for [f], *but that is fine*
- No phonological pattern links the two, *pace* Reiss (2017)

5.4 Explanation in phonology

- Why is [v] like this?
 - ☞ It is underlyingly /w/ *vel sim.* (e.g. Lightner 1972, Coats & Harshenin 1971, Hayes 1984, Kiparsky 1985)
 - No evidence that it is
 - Complex account with various problems
 - ☞ There is a sonorant [v] → [f] (Shevoroshkin 1971, Padgett 2002)
 - No evidence that this is a phonological process
 - Does not fit the phonetic evidence on the nature of Russian [v] (Bjorndahl 2015)
 - ☞ [v] is not specified for [±voice] (Hall 2004, Reiss 2017)
 - Fits the account here...
 - ... but still requires phonological /v/ → [f], for which the evidence is slim

5.5 Conclusion

- Russian /v/ is not affected by any *phonological* devoicing process
- There is no evidence that [v] and [f] are ‘contrastive twins’ for [±voice]
- In a modular framework with language-specific realization of features, asymmetric behaviour follows from asymmetric specification
- The asymmetric specification follows from the contrastive hierarchy (see in particular Dresher 2014, Cowper & Hall 2014)
- Russian [v] is not a problem for the Contrastivist Hypothesis

5.6 Exercises to the reader

- If there is no phonological devoicing before a morphological zero in [.trʲe.zv_], [.ʂtu.ʒb_], what are the implications for our analysis of devoicing?
 - Problem for presonorant/prevocalic faithfulness (e. g. Padgett 2002, Rubach 2008)?
 - Problem for cue-based accounts of neutralization (Steriade 1997)?
 - Less of a problem for onset faithfulness (Beckman 1998)? But Russian syllabification is notoriously a problem (e. g. Côté & Kharlamov 2011)
- If the GEN.PL / MASC.PRED zero is different from the NOM.SG zero, what are the consequences for CVCV approaches to yers?
- If obstruent voicing assimilation is phonetic across at least some boundaries, where does this leave the Halle (1959) ‘duplication’ argument?

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