Yer vowels

Yer patterns

What are yers?

- Reflexes of the Common Slavic *ъ, *ь
- Generally reconstructed as [ʊ ɪ], though the reasoning is not always explicit.
- Commonly considered to be 'reduced' in quantity and/or quality
- 'Fleeting' vowels that synchronically alternate with zero

Table 1: Some examples of vowel-zero alternations

Item	Form	Ukrainian	Polish	Slovak	BCMS
'dog'	NOM.SG	pes	pies	pes	pas
	NOM.PL	psɨ	psy	psy	psi
'dream'	NOM.SG	son	sen	sen	san
	NOM.PL	snɨ	sny	sny	sni
'coal'	NOM.SG		węgiel	uhoľ	ugao
	NOM.PL		węgle	uhle	ugli
'board'	NOM.SG	doška	deska	doska	daska
	GEN.PL	doščok	desek	dosák ~ dosiek	das(a)ka

Yer patterns: Havlík and Lower

In traditional parlance, yers are either

- Strong, in which case they merge with some other vowel
- Weak, in which case they delete

> Two main patterns and a minor one
>
> - Havlík's Law: weak and strong alternate, starting at the right edge of a sequence
> - Lower Rule: a yer is strong before a yer, weak otherwise
> - Minor pattern: like Lower, but a yer is weak before a voiceless consonant and a weak yer

Yers and morphology

Common Slavic did not have word-final consonants (or indeed any codas, with very few exceptions). Today's final consonants generally used to

precede a word-final yer: these are weak under all versions of the rule. The yers are often inflectional markers that alternate with full vowels in the paradigm, yielding strong-weak alternations in the stem.

Table 2: Inflection of n-stem **dьnь* 'day' in OCS

Case	SG	PL
NOM	dьnь	dьne
GEN	dьne	dьnъ
INS	dьnьmь	dьnьmi

Havlík

The predicted pattern is a zero-vowel alternation site for every yer.

Table 3: Predicted pattern of alternation under Havlík

Pre-Havlík	Havlík	Gloss
pьs-ъ	pes	'dog-NOM'
pьs-a	psa	'dog-GEN'
pьs-ьk-ъ	psek	'dog-DIM-NOM'
pьs-ьk-a	peska	'dog-DIM-GEN'
pьs-ьč-ъk-ъ	pesček	'dog-DIM-DIM-NOM'
pьs-ьč-ъk-a	psečka	'dog-DIM-DIM-GEN'

- Robust in Old Czech, Old Polish, but hardly every found today
  - Cz *švec* 'cobbler', GEN.SG *ševce*; Ukrainian *švec'*, GEN.SG *ševc'a* < **šьvьcь*
  - Slk *dom* 'house', dimunitives *domok*, *domček* (cf. Cz *domeček*)
  - Po *sejm* < *sъjьmъ* if by levelling from oblique *sъjьma* etc.

Lower

The predicted pattern is that all yers before a yer vocalize. Note that for the rule to work it has to be applied left to right.

Table 4: The Lower pattern in Present-Day Polish

Pre-vocalization	Lower	Gloss
pьs-ъ	pies	'dog-NOM'
pьs-a	psa	'dog-GEN'
pьs-ьk-ъ	piesek	'dog-DIM-NOM'
pьs-ьk-a	pieska	'dog-DIM-GEN'

Pre-vocalization	Lower	Gloss
pьs-ьč-ъk-ъ	pieseczek	‘dog-DIM-DIM-NOM’
pьs-ьč-ъk-a	pieseczka	‘dog-DIM-DIM-GEN’

> ⚠ Synchronic corollary
>
> The synchronic consequence is that there can only be one vowel-zero alternation site per paradigm

Segmental patterns of yers

Vocalized yer quality

Language	**sъnъ* ‘dream’	**dьnь* ‘day’	Comment
Ukrainian	son	den’	ь > e, ъ > o
Russian	son	d’en’	ь > e + C’, ъ > o
Belarusian	son	dz’en’	ь > e + C’, ъ > o
Upper Sorbian	són	dźeń	ь > ɛ + C’, ъ > ɔ
Lower Sorbian	seń	źeń	ь > ɛ + C’, ъ > ɛ/a
Polish	sen	dzień	ь > ɛ + C’, ъ > ɛ
Slovak	sen	den	ь > ɛ + C’, ъ > ɛ (but see note)
Czech	sen	den	Almost full merger
Bulgarian	sъn	den	ь > e, ъ > ъ
Macedo-nian	son	den	ь > e, ъ > o
BCMS	san	dan	Full merger
Slovenian	sən	dan	Full qualitative merger

A typology of yer outcomes

We can roughly typologize the qualitative reflexes as follows

- Do the two yers remain distinct in quality?
  - Yes: East Slavic, Sorbian, Bulgarian, Macedonian
  - No: Polish, Czech, BCMS, Slovenian
  - Chaos: Slovak (roughly no in the east and west, yes in the centre)
- Does the front yer soften the preceding consonant?
  - Yes: Russian, Belarusian, Polish, Sorbian, (most of) Slovak
  - No: Czech (mostly, although there are some traces)

- Irrelevant: Ukrainian, South Slavic

Vowels alternating with zero	Difference in consonant behaviour	Languages
Multiple	Yes	Russian, Belarusian, Sorbian: [ɛ ɔ] Slovak: [ɛ ɔ ɑ ɑː i͡e] Bulgarian: [ъ ɛ]
Multiple	No	Macedonian: [ɛ ɔ] Ukrainian: [ɛ ɔ] Slovenian: [ə aː]
One	Yes	Polish: [ɛ] (marginally [ɔ])
One	No	Czech: [ɛ] BCMS: [a]

Preliminary summary

What does any theory of yers need to explain?

- Why do some vowel alternate with zero and others don't?
- How do know when to vocalize and when to delete?
- When the yer vocalizes, what quality does it have?

Previous approaches

> Further reading
>
> For a more detailed account, see Tobias Scheer. 2006. How yers made Lightner, Gussmann, Rubach, Spencer and others invent CVCV. in Piotr Bański, Beata Łukaszewicz & Monica Opalińska (eds.), *Studies in constraint-based phonology*, 133–207. Warsaw: Wydawnictwo Uniwersytetu Warszawskiego (online here) or the updated version in Tobias Scheer. 2010a. *A guide to morphosyntax–phonology interface theories: How extra-phonological information is treated in phonology since Trubetzkoy's* Grenzsignale. Berlin: Mouton de Gruyter

The Lower rule

Lightner:[1] the Lower rule for Russian

ĭ ŭ → e o / _ C_0 {ĭ ŭ}, applying left to right

[1] Theodore M. Lightner. 1965. *Segmental phonology of Modern Standard Russian*. Cambridge, MA: Massachusetts Institue of Technology dissertation.

The effect is that all yers before a yer vocalize, but the last yer in a sequence, or a yer before a non-yer vowel, do not and can eventually be deleted

The front yer is a normal front vowel and can do everything that front vowels do:

- Palatalize preceding consonants
- Undergo backing once it has merged with /ě/

Some Russian derivations

I simplify the detail, especially regarding cyclicity.

Rule	/dĭn+ĭ/	/dĭn+ī/	/dĭn+ĭk+ŭ/	/dĭn+ĭk+ĭk+ŭ/
Palatalization	dʲĭnʲĭ	dʲĭnʲī	dʲĭnʲĭkŭ	(dʲĭnʲĭk)ĭkŭ
Lower	dʲĕnʲĭ	dʲĭnʲī	dʲĕnʲĕkŭ	(dʲĕnʲĕk)ĭkŭ
Backing			dʲĕnʲŏkŭ	(dʲenʲŏk)ĭkŭ
Palatalization				dʲĕnʲŏčʲĭkŭ
Lower				dʲĕnʲŏčʲĕkŭ
Yer deletion	dʲĕnʲ	dʲnʲī	dʲĕnʲŏk	dʲĕnʲŏčʲĕk
Late rules	dʲenʲ	dnʲi	dʲenʲok	dʲenʲočʲek
Gloss	‘day-NOM’	‘day-PL’	‘day-DIM-NOM’	‘day-DIM-DIM-NOM’

Things to note:

- Lower vocalizes all yers except the last one in a sequence: therefore, only the last yer in a sequence will alternate with zero
- Non-vocalized yers are responsible for:
  - Word-final soft consonants (*d’en’* ‘day’)
  - Vocalization of yers before ‘zero suffixes’:
    - *d’en’-*∅ ‘day-SG’ ~ *dn’i* ‘day.PL’
    - *d’ev-k-a* ‘girl’ ~ GEN.PL *d’evok-*∅ ~ *d’evočka* ‘DIM’ ~ *d’evoček* ‘DIM.GEN.PL’
  - Palatalization by suffixes that are consonant-initial on the surface
    - *d’evočka* ‘girl’ ← /dēv+ŭk+ĭk+ō/
    - *kol’ésnik* ‘wheelwright’ ← /kŏlĕs+ĭn+īk+ŭ/, note lack of backing

Extending the analysis: Polish

In Polish, the vowel alternating with zero is almost always [ɛ]. However, if we posit a back and a front yer we get all the same mileage as we do in Russian; in particular by removing underlying consonant softness

Rule	/sOn+O/	/sOn+ɨ/	/dEn+E/	/dEn+i/
Palatalization			dʲEnʲE	dʲEnʲi
Lower	sɛnO	sOnɨ	dʲɛnʲE	dʲnʲi
Yer deletion	sɛn	snɨ	dʲenʲ	dʲnʲi
Late rules	sɛn	snɨ	d͡ʑɛɲ	dɲi

Further evidence: secondary imperfective ablaut/tensing

Vocalized yer	Weak yer	Imperfective	Gloss
zapiąć [pʲɔɲ]	zapnę	zapinać	‘fasten’
nadąć [dɔɲ]	nadmę	nadymać	‘inflate’

Summary of the classical approach

- Why do some vowel alternate with zero and others don’t?

  They are featurally different in the underlying representation

- How do we know when to vocalize and when to delete?

  The Lower rule is sensitive to the features of vowels in the following syllable

- When the yer vocalizes, what quality does it have?

  Determined by the Lower rule

  Some more questions we might ask

- Do we need these highly abstract URs and absolute neutralization rules?
- Where is the phonotactics of consonant clusters in all this?
- If the quality of vocalized yers is only up to the Lower rule, why are they (almost) always identical to some other vowel?

Autosegmentalizing Lower

With the advent of autosegmental phonology, the property of ‘alternating with zero’ could be encoded by means other than segmental features

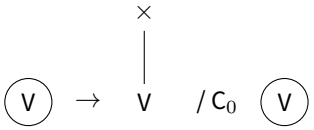

Figure 1: Autosegmental Lower with defective representations

What does this get us?

- Any vowel can be a yer: East Slavic, Sorbian, especially Slovak,[2] even Polish

[2] Jerzy Rubach. 1993. *The lexical phonology of Slovak*. Oxford: Clarendon Press.

- No special 'yer subinventory': yers are featurally regular
- What is special about yers is prosodic position
- CVCV phonology: alternation with zero follows from first principles
- CVCV phonology: clearly articulated link with phonotactics

Phonotactics, deletion, and insertion

Deletion or insertion?

In principle, vowel-zero alternations can be due to either deletion or insertion

- The standard account relies on deletion
- Why not insertion? Two reasons
  - Phonotactics
  - Vowel quality

Insertion and phonotactics

- Insertion could be driven by
  - Avoidance of bad sonority profiles
  - Avoidance of consonant clusters (at word edges) *tout court*

Yers and cluster avoidance

- Classic examples aiming to show an absence of general cluster avoidance
  - Russian *laska* 'stoat' ~ *lasok* 'GEN.PL' vs. *laska* 'tenderness' ~ *lask* 'GEN.PL'
  - Russian *z'erno* 'grain' ~ *z'or'en* 'GEN.PL' vs. *s'erna* 'chamois' ~ *s'ern* 'GEN.PL'
  - Polish *trumna* 'coffin' ~ *trumien* vs. *kolumna* 'column' ~ *kolumn* 'GEN.PL'
  - Slovak *octu* 'vinegar.GEN.SG' ~ *ocot* 'NOM.SG' vs. *pocta* 'distinction' ~ *pôct* 'GEN.PL'

Yers and sonority profiles

- Classic examples showing that suboptimal sonority profiles are tolerated
  - Russian *t'eatr* 'theatre', *os'otr* 'sturgeon'
  - Polish *wiatr* 'wind', *cyfr* 'figure.GEN.PL'

However…

- In BCMS[3] only coronal fricative-stop clusters are allowed word-finally
  - Everything else is broken up by a vowel, leading to alternations
  - The only vowel involved is [a]

[3] In the native lexicon… there are loanword and other complications

- *vjetar* ~ *vjetru* ‘wind’ like *sladak* ~ *slatki* ‘sweet’
- There is a plausible insertion analysis

Sonority and epenthesis

At least historically, in many languages word-final rising-sonority clusters **were** partially or fully removed by epenthesis. This leads to vowel-zero alternations basically indistinguishable from those involving historical yers

- BCMS *vjetar* ‘wind’, *oštar* ‘sharp’ ~ *vjetri*, *oštri*
- Bulgarian *ogъn* ‘fire’, *ostъr* ‘sharp’ ~ *ogn’ove*, *ostri*[4]
- Russian *v’et’er* ‘wind’, *ogon’* ‘fire’, *v’ód’er* ‘bucket.GEN.PL’ ~ *v’etrɨ*, *ogn’i*, *v’ódra*[5]
  - On the other hand, *m’etr* ‘metre’

[4] Bulgarian in general has quite restricted syllable phonotactics.

[5] Alexander V. Isačenko. 1970. East Slavic morphophonemics and the treatment of the jers in Russian: A revision of Havlík’s Law. *International Journal of Slavic linguistics and poetics* 13. 73–124.

Why not both?

- Bethin;[6] Scheer[7] identify a crucial contrast in Polish and Russian

Language	UR	NOM.SG	GEN.SG	DIM	Gloss
Polish	/t͡sɨfr/	cyfra	cyfr	cyferka	‘figure’
	/srebEr/	srebro	sreber	sreberka	‘silver’
Russian	/igl/	igla	igl	igolka	‘needle’
	/kukOl/	kukla	kukol	kukolka	‘doll’

[6] Christina Y. Bethin. 1992. *Polish syllables: The role of prosody in phonology and morphology*. Columbus: Slavica Publishers.

[7] Tobias Scheer. 2012. Variation is in the lexicon: Yer-based and epenthetic vowel-zero alternations in Polish. In Eugeniusz Cyran, Henryk Kardela & Bogdan Szymanek (eds.), *Sound, structure and sense: Studies in memory of Edmund Gussmann*, 631–672. Lublin: Wydawnictwo KUL.

- In the GEN.SG, we find regular yer vocalization. If there is no yer underlyingly, there is no vowel
- In the DIM, we find a vowel even if there is no yer, likely for phonotactic reasons

> **!** A prediction
>
> When a vowel is inserted, its quality should be predictable

Yers and predictability: Russian

Is yer quality predictable?

- Scheer[8] *passim*, and many others: no

Context	*e*	*o*
C^{j}_	*d’en’* ~ *dn’a* ‘day’	*l’on* ~ *l’na* ‘linen’
C_	*	*son* ~ *sna* ‘dream’

[8] Tobias Scheer. 2011. Slavic yers. In Marc van Oostendorp et al. (eds.), *The Blackwell companion to phonology*. Oxford: Blackwell Publishing.

Remember that *e* after hard consonants (excluding the historically soft *š ž c*) is not usual

Halle[9] referring to Klagstad:[10] yes

> 1.52 Russian possesses a series of stems which have forms with and without vowels. Wherever these alternations are not predictable from other – i.e., grammatical or phonological – factors, it is necessary to indicate them in the dictionary representation of the morpheme. This will be done by writing the symbol # in the position where the vowel is inserted – e.g., {t'ur#k} "Turk", but {p'ark} "park"; cf. the respective nom. sg. {t'urok} and {p'ark} and the gen. sg. {t'urk+a} and {p'ark+a}.
>
> It has been shown by Klagstad that with a few exceptions which must be given in a list, the vowel features of # can be predicted from the context.[24] # will, therefore, be characterized as vocalic and nonconsonantal with zeros for all other features, i.e., as a vowel without reference to any other vowel feature.

[9] Morris Halle. 1959. *The sound pattern of Russian: A linguistic and acoustical investigation*. 's Gravenhage: Mouton.

[10] Jr. Klagstad Henry L. 1954. *Vowel-zero alternations in Modern Standard Russian*. Cambridge, MA: Harvard University dissertation.

Like other aspects of the pre-1960s approach, this view survived in Slavic circles[11]

Zaliznyak:[12] yes (essentially)

А. Основная цепь формул перехода (обязательная для всех словоформ)

I. Переход части звездочек в нуль и сопутствующие изменения

1. * (+ *CI'*, *C'Г* или *C|Г*, *C'|Г*) → Ø
2. (не *л* +)' (+ *н*, *л*, *р*, *ц*, *с* или *т*) → Ø
3. *C* (+ *j* или |*j*) → *C'*

II. Переход остальных звездочек в гласные [170]

4. *безуд. (+ *j*) → *и*
5. * (+*j*) → *е*
6. (*j*, ', *Ш* или *ц* +) * (+ *ц*, *л'* или *н'*) → *е*
7. * → *о*

[11] e.g. Charles Townsend. 1975. *Russian word-formation*. Columbus, OH: Slavica Publishers; William S. Hamilton. 1976. Vowel power versus consonant power in Russian morphophonemics. *Russian Linguistics* 3(1). 1–18. https://doi.org/10.1007/BF00177211; William S. Hamilton. 1980. *Introduction to Russian phonology and word structure*. Columbus, OH: Slavica Publishers.

[12] Andreĭ Anatol'evich Zaliznyak. 1967. *Russkoe imennoe slovoizmenenie*. Moscow: Nauka.

What this is a set of deterministic rules that rewrite an asterisk (an alternation site) to a vowel or zero.

The return of the mid vowel alternation

- After a hard consonant, the yer is **always** [o]
- After a soft consonant, the yer is either [e] or [o]
- In the classical analysis, this is backwards: the soft consonant is soft **because** the yer is front
- The sequence [C^{j}o] from /Cĭ/ arises by the sequence of Palatalization > Lower > Backing

An alternative

- Most notably Farina[13]
  - Insert [o] after hard consonant
  - Insert [e] after soft consonant, take a ride on the backing rule
- Scheer:[14] this would have worked, but the price of the backing rule is underlying /ъ/ (or too many exceptions)

[13] Donna Marie Farina. 1991. *Palatalization and jers in modern Russian phonology: An underspecification approach*. Champaign: University of Illinois at Urbana-Champaign dissertation.

[14] Tobias Scheer. 2010b. Why Russian vowel-zero alternations are not different, and why Lower is correct. *Language and Language Behavior* 9. 77–112.

So, unpredictable after all?

- Yesterday we developed an account of the *e* ~ *o* alternation mostly allowed us to cope with exceptionality
- Two classes of mid vowel after [C^{j}]

1. [e] before a softening suffix, [o] elsewhere
2. Non-alternating [e]

As with the stable *e* ~ *o* alternation, we need to remember that spelling is an unreliable guide: we can only know the quality of the yer after a soft consonant reliably when it is stressed.

- It turns out that when a vowel alternates with zero, it is **overwhelmingly** type 1
- The exceptions are either conditioned (before *j c l' n'*)[15] or tiny in number: in the nouns, there is a total of **five** exceptions.[16] I can live with that.

[15] Cf. *zem'él'* 'earth.GEN.PL', *s'em'éj* 'family.GEN.PL' from *zeml'a*, *sem'ja* with a non-softening suffix.

[16] Zaliznyak, *Russkoe imennoe slovoizmenenie*; Pavel Iosad. 2020. Per aspera ad astra: Nuli i zvezdochki v russkoĭ morfonologii. In Andreĭ Aleksandrovich Kibrik et al. (eds.), *VAProsy̆ yazy̆koznaniya: Megasbornik nanostateĭ.* [A Festschrift for Vladimir Plungian], 69–73. Moscow: Buki Vedi.

Summing up

- The quality of Russian yers is mostly predictable if
  - We take into account the softness of the preceding consonant
  - We adapt our analysis of mid vowels: when the right context drives the choice, the front outcome is conditioned and the back outcome is the elsewhere
- We still (mostly) cannot predict **when** the vowel is inserted or not

Conclusion

Why does this matter?

I have not focused here on the very tough problem of what makes the yers vocalize or not. Instead, I would like us to think about what this analysis tells us about the viability of the standard approach.

- The analysis relies on consonant softness being present **before** yer quality is resolved: 'consonant power'
- This is incompatible with the classical account, where the consonant is soft **because** the yer is front: 'vowel power'

- Who is right?

Consonant power revisited

- In the consonant power approach
  - Consonant softness can be underlying
  - Palatalization is not a sure-fire sign of an underlying front vowel
- Repeated attempts to resurrect this in the generative tradition[17] have not been too influential
- Vowel power continues to rule the roost[18]

One final prediction

Scheer:[19] 'if a vowel is epenthetic, its quality cannot be contrastive'

NOM.SG	GEN.PL	Derivative	Gloss
igla	igl	ig**ó**lka	'needle'
iskra	iskr	isk**o**rka	'spark'
nasmork		násmor**o**čnɨj	'cold'
pol'za	pol'z	pol'**é**znɨj	'useful'
vojna	vojn	voj**é**nnɨj	'war'
korabl'		korab'**é**l'nɨj	'ship'
s'el'd'		s'el'**ó**dka	'herring'

- The vowels are not yers — but they follow the generalizatons quite precisely
- The softness of the consonants determines the quality of the vowels, not the other way around

> **Note**
>
> There are a couple of counterexamples here, namely *v'eng'érka* 'Hungarian woman' (*v'engr* 'Hungarian man'), noted by Tobias Scheer. 2010b. Why Russian vowel-zero alternations are not different, and why Lower is correct. *Language and Language Behavior* 9. 77–112, and *šl'ax'etsk'ij* 'belonging to the szlachta' (*šl'axta* 'szlachta'), where the soft velars **are** likely due to the following front vowel, not the other way around. Both are Polish borrowings and are plausibly stored exceptions.

In order to salvage the postulate that consonant softness always comes from a front vowel, the classical approach is forced to stipulate the quality of the epenthetic vowel.

[17] Farina, "Palatalization and jers in modern Russian phonology"; Michael Sherman Boyd. 1997. *Palatalization and coronalization in Russian and Czech: A non-linear approach*. Columbus, OH: The Ohio State University dissertation; Jaye Padgett. 2011. Russian consonant–vowel interactions and derivational opacity. In Wayles Brown et al. (eds.), *Formal Approaches to Slavic Linguistics 18: The second Cornell meeting, 2009*, 352–381. Ann Arbor, MI: Michigan Slavic Publications.

[18] Morris Halle & Ora Matushansky. 2002. [αback] assimilation in Russian: An overview. In Aniko Csirmaz et al. (eds.), *Phonological answers (and their corresponding questions)* (MIT Working Papers in Linguistics 42), 69–80. Cambridge, MA: MITWPL; Jerzy Rubach. 2000. Backness switch in Russian. *Phonology* 17(1). 39–64. http://www.jstor.org/stable/4420162; Jerzy Rubach. 2005. Mid vowel fronting in Ukrainian. *Phonology* 22(1). 1–36; Jerzy Rubach. 2016. Polish yers: Representation and analysis. *Journal of Linguistics* 52(2). 421–466. https://doi.org/10.1017/s0022226716000013.

[19] Scheer, "Variation is in the lexicon".

What's next?

Tomorrow, we reconsider the status of the historically informed traditional approach.

References

Bethin, Christina Y. 1992. *Polish syllables: The role of prosody in phonology and morphology*. Columbus: Slavica Publishers.

Boyd, Michael Sherman. 1997. *Palatalization and coronalization in Russian and Czech: A non-linear approach*. Columbus, OH: The Ohio State University dissertation.

Farina, Donna Marie. 1991. *Palatalization and jers in modern Russian phonology: An underspecification approach*. Champaign: University of Illinois at Urbana-Champaign dissertation.

Halle, Morris. 1959. *The sound pattern of Russian: A linguistic and acoustical investigation*. 's Gravenhage: Mouton.

Halle, Morris & Ora Matushansky. 2002. [αback] assimilation in Russian: An overview. In Aniko Csirmaz et al. (eds.), *Phonological answers (and their corresponding questions)* (MIT Working Papers in Linguistics 42), 69–80. Cambridge, MA: MITWPL.

Hamilton, William S. 1976. Vowel power versus consonant power in Russian morphophonemics. *Russian Linguistics* 3(1). 1–18. https://doi.org/10.1007/BF00177211.

Hamilton, William S. 1980. *Introduction to Russian phonology and word structure*. Columbus, OH: Slavica Publishers.

Iosad, Pavel. 2020. Per aspera ad astra: Nuli i zvezdochki v russkoĭ morfonologii. In Andreĭ Aleksandrovich Kibrik et al. (eds.), *VAProsy̆ yazy̆koznaniya: Megasbornik nanostateĭ*. [A Festschrift for Vladimir Plungian], 69–73. Moscow: Buki Vedi.

Isačenko, Alexander V. 1970. East Slavic morphophonemics and the treatment of the jers in Russian: A revision of Havlík's Law. *International Journal of Slavic linguistics and poetics* 13. 73–124.

Klagstad, Jr., Henry L. 1954. *Vowel-zero alternations in Modern Standard Russian*. Cambridge, MA: Harvard University dissertation.

Lightner, Theodore M. 1965. *Segmental phonology of Modern Standard Russian*. Cambridge, MA: Massachusetts Institue of Technology dissertation.

Padgett, Jaye. 2011. Russian consonant–vowel interactions and derivational opacity. In Wayles Brown et al. (eds.), *Formal Approaches to Slavic Linguistics 18: The second Cornell meeting, 2009*, 352–381. Ann Arbor, MI: Michigan Slavic Publications.

Rubach, Jerzy. 1993. *The lexical phonology of Slovak*. Oxford: Clarendon Press.

Rubach, Jerzy. 2000. Backness switch in Russian. *Phonology* 17(1). 39–64. http://www.jstor.org/stable/4420162.
Rubach, Jerzy. 2005. Mid vowel fronting in Ukrainian. *Phonology* 22(1). 1–36.
Rubach, Jerzy. 2016. Polish yers: Representation and analysis. *Journal of Linguistics* 52(2). 421–466. https://doi.org/10.1017/s0022226716000013.
Scheer, Tobias. 2006. How yers made Lightner, Gussmann, Rubach, Spencer and others invent CVCV. In Piotr Bański, Beata Łukaszewicz & Monica Opalińska (eds.), *Studies in constraint-based phonology*, 133–207. Warsaw: Wydawnictwo Uniwersytetu Warszawskiego.
Scheer, Tobias. 2010a. *A guide to morphosyntax–phonology interface theories: How extra-phonological information is treated in phonology since Trubetzkoy's* Grenzsignale. Berlin: Mouton de Gruyter.
Scheer, Tobias. 2010b. Why Russian vowel-zero alternations are not different, and why Lower is correct. *Language and Language Behavior* 9. 77–112.
Scheer, Tobias. 2011. Slavic yers. In Marc van Oostendorp et al. (eds.), *The Blackwell companion to phonology*. Oxford: Blackwell Publishing.
Scheer, Tobias. 2012. Variation is in the lexicon: Yer-based and epenthetic vowel-zero alternations in Polish. In Eugeniusz Cyran, Henryk Kardela & Bogdan Szymanek (eds.), *Sound, structure and sense: Studies in memory of Edmund Gussmann*, 631–672. Lublin: Wydawnictwo KUL.
Townsend, Charles. 1975. *Russian word-formation*. Columbus, OH: Slavica Publishers.
Zaliznyak, Andreĭ Anatol'evich. 1967. *Russkoe imennoe slovoizmenenie*. Moscow: Nauka.