Slavisk filologi

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INNEHÅLL

Tabula gratulatoria
7

Beata Agrell
Konsten som grepp
— formalistiska strategier och emblematiska tankeformer
17

Caisa Alfredson
Struktur och variation
i Gogol's *Večera na chutore bliz Dikan'ki*
52

Per-Olof Andersson
Ry. *весь* — *целый* och bestämdhet i nominalfraser
57

Per-Arne Bodin
Försvarsskrift eller litterärt manifest?
Fedor Dostoevskijs inlaga i Petraševskij-målet
66

Tomas Forser
Projekt och retorik i Tjechovs *Tre systrar*
80

Roger Gyllin
Tre dikter av Blaga Dimitrova
88

Elena Hellberg-Hirn
Поцелуи на морозе: приветствие и прощание
91

Arne Hult
The Doomed Souls
— Some Observations on Dimităr Dimov's Novels
99

Gunnar Jacobsson
Vägen till Oreus
— det akvatiska motivet hos Ivan Konevskoj
116

Bengt Jangfeldt
Majakovskijs "A vy mogli by?"
Försök till analys
122

Lars Kleberg
Lev Rubinsteins "Tiden går" (1990)
134
Världen på kort
147

Roman Laskowski
Pryswajanie iminnych kategorii gramatycznych
przez polskie dzieci w Szwecji (Kilka uwag)
153

Eva Lilja
Vass glass
Något om rytm och klang som kommunikation
162

Lars Lindvall
Med frankerna från Bysans till *Star Trek*
182

Magnus Ljunggren
Belyjs *Peterburg* och Schweiz
191

Lennart Magnusson
Det vackra i det vardagliga — något om naturskildringen
i Konstantin Paustovskijs novell "Farväl till sommaren"
199

Märta-Lisa Magnusson
Den rysk-tjetjenska förhandlingsprocessen
207

Bertil Nelhans
Den makedonska frågan
223

Morgan Nilsson
Voicing Alternations in Slavic
227

Bertil Nolin †
Georg Brandes och hans nätverk i öster
242

Gerrit Otterloo
Antonio som introvert polemiker.
Om den antonianska sonetten
253

Bo Ralph
"Der var ett lif och ett kif."
August Strindberg som språkhistorisk aktör
264

Marianna Raneva-Ivanova
Transfiguration of Christian Motif Function
in a Chekhov Short Story
276

Maj-Britt van Reisen
Sex dikter av Vladimir Vysotskij
286

Mirja Varpio
The Length of the Church Slavonic Night and Day
299

Claes Wennerberg †
Woher kommt finnisch *juhta*?
304

Nadezjda Zorikhina
Употребление лексем «ГОРОДЬ — ГРАДЬ»
в Лаврентьевском списке «Повест временных лет»
311

Johan Öberg
Postkommunism, postmodernism
och det kulturella samarbetet med Ryssland
331

Carl Fredrik Gildea
Rebecca West och Kosovo
339

Morgan Nilsson

Voicing Alternations in Slavic*

Introduction

Slavic languages exhibit voicing alternations in different contexts (cf., e.g., for Czech PALKOVÁ (1994), for Slovak RUBACH (1993), for Polish DUKIEWICZ (1995) and SAWICKA (1995), for Ukrainian BILODID (1969), for Serbo-Croatian BARIĆ et al.(1979)). These alternations are most commonly referred to as 'final devoicing' and 'regressiv obstruent assimilation'. In short, final devoicing means that any word final obstruent is pronounced as voiceless. Regressive obstruent assimilation means that in any sequence of obstruents, all obstruents are pronounced with the voice value of the last obstruent of the sequence. However, these two traditional rules do not cover all voicing phenomena of the Slavic languages. Quite a few further rules and/or exceptions to the rules are required, as, e.g., sandhi rules and cases of progressive obstruent assimilation. The aim of this article is to provide a coherent analysis of these phenomena within a framework, which only recognises universal principles and language specific parameters, i.e., Government Phonology (GP). It will be shown that we can find a set of universal principles answering the questions 'What happens?', 'Where does it happen?', and 'Why does it happen?' and language specific sets of parameters that regulate the application of these principles. In order to limit the amount of data, the languages analysed will be the West Slavic languages Czech, Slovak, and Polish, the latter in its two literary standards, i.e., Warsaw and Cracow standard respectively, and two rather interesting languages, Ukrainian and Serbo-Croatian, which in some important respects differ from the majority of Slavic languages.

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* This article is dedicated to Bengt Lundberg, who was the first to introduce me to phonological issues. Phonology has ultimately become the subject of the Ph.D. dissertation that I am presently working on in Lublin, Poland, under the supervision of Professor Edmund Gussmann, to whom I am indebted for his extensive support. As Bengt introduced me to Russian and Serbo-Croatian phonetics and phonology, I felt it appropriate to extend the data to at least the latter of these two languages, as its voicing phenomena are rather peculiar from a Slavic point of view.

1. Composition and decomposition

Let us first look at some data showing the final devoicing:

(1) Czech:

[sr̩**p**	sr̩**bɪ**]	*Srb*	*Srby*	'Serbian-Nsg ~ AIpl'
[sr̩**p**	sr̩**pɪ**]	*srp*	*srpy*	'sickle-NAsg ~ NAIpl'

Slovak:

[nʊ**c**	nʊ**ɟi:**]	*nuď*	*nudí*	'bore-imp ~ 3psg pres'
[nu:**c**	nu:**cɪ**]	*núť*	*núti*	'force-imp ~ 3psg pres'

Polish (Warsaw as well as Cracow standard):

[kʊ**s**	kɔ**z**a]	*kóz*	*koza*	'goat-Gpl ~ Nsg'
[kɔ**s**	kɔ**s**a]	*kos*	*kosa*	'scythe-Gpl ~ Nsg'

Ukrainian:[1]

[lʲ**i**d	lʲɔ**d**ʊ]	*лід*	*льоду*	'ice-NAsg ~ Gsg'
[lʲ**i**t	lʲɔ**t**ʊ]	*літ*	*льоту*	'flight-NAsg ~ Gsg'

Serbo-Croatian:

[sa:**d**	sa:**d**a]	*sad*	*sada*	'garden-NAsg ~ Gsg'
[sa:**t**	sa:**t**a]	*sat*	*sata*	'hour-NAsg ~ Gsg'

Considering these data, we need first introduce some basic concepts of GP. According to, e.g., KLV (1990) and HARRIS (1994), every onset must be licensed by a following nucleus/rhyme and every coda must be licensed by a following onset. The theory also accounts for empty nuclei. These principles impose that a domain final consonant never can be a coda, as there is no onset following, hence the structures in (2), showing the Czech examples from (1).

(2)

O	N	O	N	O	N	O	N	O	N	O	N	O	N	O	N
|	|	|	|	|	|	|	|	|	|	|	|	|	|	|	|
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
|	|	|		|	|	|	|	|	|	|		|	|	|	|
s	r	p		s	r	b	i	s	r	p		s	r	p	i

The matter which interests us at this point, is what might be the reason for the voiceless pronunciation of obstruents word finally in Czech, Slovak and Polish? To be able to answer this question, we need to introduce the notion of elements, which are the building-bricks of phonological expressions (more or less corresponding to the

[1] I only consider Standard Literary Ukrainian, as the Western Ukrainian usage corresponds to the Polish pattern.

traditional phoneme) in GP. The elements are privative units, which primarily represent acoustic features. The elements of major interest to us in this analysis are **L**, standing for low tone (perceived as voicedness and articulated with slack vocal cords), and **H**, standing for high tone (perceived as voicelessness and articulated with stiff vocal cords). We also need to know that the nucleus, when licensing a preceding onset, gives licensing power to the onset. This power is necessary for the onset to be able to license its melody. The stronger the onset, the more melodic material can be licensed. Hence, the obvious reason for the voiceless pronunciation of obstruents word finally in a row of languages is the lack of melodic material associated with the following licensing nucleus, which results in the nucleus being a weak licenser and the preceding onset not being able to license all its elements. In Czech, Slovak and Polish **L** and **H** are therefore supressed. Phonological expressions containing the occlusion element **ʔ** (realised as stop), or the noise element **h** (realised as friction in all obstruents), are realised as voiceless if they lack an element defining the tone, i.e., **L** or **H**. Brockhaus (1995) suggests that according to tests conducted with, among others, German and Polish informants, there might still be a minimal phonetic difference in the realization of expressions containing a supressed (**L**) and (**H**) respectively, but that both realisations are practically voiceless.

(3) Czech:

a. [sr̩p] *Srb*

```
O N O N
| | | |
x x x x
| | |
s r U²
    h
    ʔ
   (L)
```

b. [sr̩bɪ] *Srby*

```
O N O N
| | | |
x x x x
| | | |
s r U i
    h
    ʔ
    L
```

In Ukrainian and Serbo-Croatian, however, the parameter regulating licensing of **L** and **H** is set so that the licensing power of an empty nucleus is enough to license the tone element in a preceding onset.

---

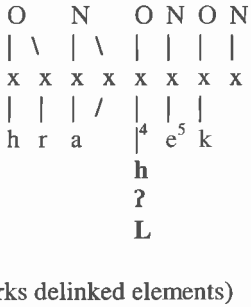
[2] Simplifying somewhat, **U** may be said to represent roundedness or labiality.

In cases involving regressive obstruent assimilation we find a somewhat different situation. Here, the first of two obstruents, adjacent on the melody tier, is followed by an emtpy nucleus word internally, as obstruents are in most cases too strong (are made up of too many elements) to occur in coda position. This is so because the following onset must be stronger than the preceding coda to be able to give the coda enough licensing power. A well formed structure for two adjacent obstruents on the melody tier therefore normally contains an empty nuclear position on the skeletal tier.[3] When the following nucleus is empty, the elements **L** and **H** are free to spread from the rightmost to the leftmost obstruent, i.e., from an onset position with a stronger licenser to a preceding onset position with a weaker licenser. As there is a principle limiting the possibilities an onset has to license elements, a so called **licensing constraint**, saying that **L** and **H** do not combine, the leftmost weaker onset delinks its tone element and incorporates the spread tone element. In (4) and (5), we have cases of spreading of the element **H**, in (6) and (7) spreading of **L**.

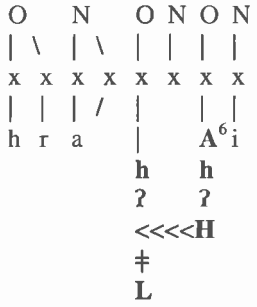
(4) Czech:
[fira:**d**ɛk fira:**t**kɪ] *hrádek hrádky* 'fortress-dim-NAsg ~ NAIpl'
Slovak:
[sʊdɪ su:tkɪ] *sudy súdky* 'barrel-NApl ~ dim-NApl'
Polish:
[ʒa**b**a ʒa**p**ka] *żaba żabka* 'frog-Nsg ~ dim-Nsg'
Serbo-Croatian:
[vra:**b**a͡ʦ vra:**p**͡ʦa] *vrabac vrapca* 'sparrow-Nsg ~ AGsg'

[3] The question of where empty nuclei may occur will not be discussed here due to lack of space. Nikiema (1989) offers a concise discussion of this matter.

(5) a. [fira:dɛk] *hrádek*



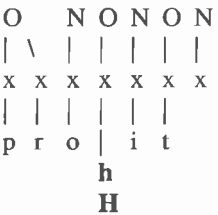
b. [fira:tkɪ] *hrádky*



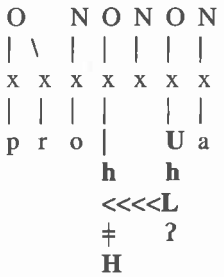
(ǂ marks delinked elements)

(6) Czech:
[prɔsit prɔzba] *prosit* *prosba* 'ask-inf ~ request-Nsg'
Slovak:
[naʃa na:ʒfiɔ] *naša* *nášho* 'our-Nsg f ~ AGsg ma/ Gsg mi/n'
Polish:
[ʲitʃitɕ ʲidʒba] *liczyć* *liczba* 'count-inf ~ number-Nsg'
Serbo-Croatian:
[ɔtaʦ ɔtadʒbɪna] *otac* *otadžbina* 'father ~ fatherland'

(7) Czech:
a. [prɔsit] *prosit*



b. [prɔzba] *prosba*



[4] Coronals lack place specification.
[5] The presence of the floating vowel in the phonological structure is a simplification without any direct effect on our analysis. For details, cf. Nikiema (1989).
[6] Simplifying somewhat, A may be said to represent backness.

All the above examples of final obstruent devoicing, as well as of regressive obstruent assimilation, are cases of lenition or **decomposition** in a weak position before an empty nucleus. The elements **L** and **H** do not succeed to be licensed in onsets which gain their licensing power from an empty nucleus. The spreading of **L** and **H** are cases of strengthening, or **composition**. These two types of phonological processes are actually the only ones recognised by GP. The source or reason for any process of composition or decomposition must be locally present, i.e., in an adjacent position and, furthermore, any principle of GP takes effect any time the conditions are met with, in other words, there is nothing like an ordering of rules. In the case of Ukrainian, the situation is somewhat different. A voiced obstruent followed by a voiceless obstruent is not assimilated, but a voiceless followed by a voiced is assimilated, as in the examples in (8).

(8) Ukrainian:

a.	[rɨ**bk**a	rɨbok]	*рибка*	*рибок*	'fish-dim. Nsg ~ Gpl'
	[bʲi**fi**te	bʲi**fi**ate]	*бігти*	*бігати*	'run-verb def. ~ indef.'
b.	[molo**dʲb**a	mɔlotej]	*молотьба*	*молотий*	'threshing-noun ~ threshed'

In (8a), we can see that **H** does not spread, whereas in (8b), **L** obviously does spread. One solution were to differentiate between the two elements, **L** being stronger, more resistent and **H** weaker, not strong enough to spread. This, however, appears as somewhat odd, and a simpler and far more straightforward way of treating the problem is to consider the element **H**, responsible for voicelessness, as not present in the Ukrainian phonological system. In Ukrainian, an obstruent not specified as to tone is realised as voiceless. The element **L** is, however, present and free to spread to adjacent obstruents.

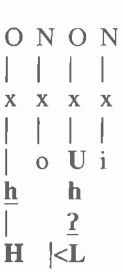
Moreover, it should be noted that any spreading of **L** or **H** is blocked by a realised nucleus. The parameter for this licensing constraint is set so that it applies in all Slavic languages. This is demonstrated in (9).

Spreading of **L** or **H** is also blocked by sonorants, as they neither contain **h** nor ʔ. All obstruents contain **h**, and for fricatives this is the most important, and strongest, element. For stops, ʔ is the most impor-tant element. Such a strong element is said to be the **head** of a phono-logical expression, whereas weaker, additional elements are said to be **operators**. Heads are marked by underlining the relevant element. Only **h** or ʔ as a head may license **L** and **H** as operators.

Therefore, the tone elements may only spread to obstruents, cf. (9).

(9) Czech:

a. [sɔbɪ] *sobi* 'reindeers'



b. [parkɪ] *parky* 'parks'

(|< denotes blocked spreading)

2. Branching onsets

In branching onsets, well-formedness constraints impose sharing of the tone element as operator, i.e., the onset complement may not independently license a tone element as operator. This means that in those languages, where we find fricatives as onset complements, these may not differ in voicing from their onset heads. That it is the onset head that is decisive for the voicing of the onset complement should come as no surprise as it is the more complex head that licenses the less complex complement.

(10) Polish:

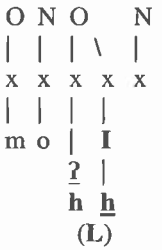
[**tʃ**ɨ]	*trzy*	'three'
[dɔ**bʒ**ɛ]	*dobrze*	'well'
[tfuj]	*twój*	'your'
[dva]	*dwa*	'two'
Czech:		
[**tř**ɪ]	*tři*	'three'
[dɔ**bř**ɛ]	*dobře*	'well'

[7] [r] is understood as a fairly strong element, therefore headed, but without any specific elements. This would nicely correspond to the fact that this phoneme has an extremely large amount of different phonetic realisations in the languages of the world.

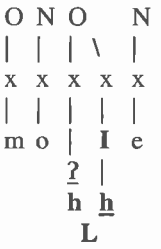
However, such a shared tone element may, of course, be suppressed before a domain final empty nucleus, as in (11).

(11) Czech:

a. [mɔt̪̊ʃ] *modř*



b. [mɔdr̝ɛ] *modře* 'blue colour-NAsg ~ Gsg/NApl'



These voicing properties are, as was explained above, mere consequences of well-formedness constraints on branching onsets. Slovak, Ukrainian and Serbo-Croatian, however, do not seem to have any branching onsets with obstruents as complements. Cases such as Slovak [psʊc] *psuť* 'spoil' or Ukrainian [pʃenit͡sʲa] *пшениця* 'wheat' obviously contain an empty nucleus, just as Cz./Slk./Pl./SCr. [psa] *psa* 'dog-AGsg' is underlyingly /pØsa/, with a floating vowel that shows up in the nominative Cz./Slk. *pes*, Pl. *pies*, SCr. *pas*.

Further, [v] as onset complement in Slk., Uk. and SCr., as well as in Cz., is a sonorant, and therefore not affected at all by the discussed sharing constraint.

3. Interonset government

The apparently same situation as in branching onsets is sometimes also attested in cases where the two obstruents are separated by an empty nucleus. The first onset is then stronger, or more complex, than the second one. Here as well, a strength relation or governing relation, which has the character of an interonset relation, can be established. The stronger element or the governor at the left spreads its tone element rightwards to its governee, cf. (12).

(12) Czech:

a. [sɛstɛr] *sester*

b. [sɛstr̥ɛ] *sestře* 'sister-GPl ~ LDsg'

4. Coda-onset governing domains

The same thing as could be said about complements in branching onsets, can also be said about codas. They may not independently license any tone element as operator. Such a tone element must be shared with the following, governing onset. Here, just as in branching onsets, there is no evidence for postulating anything else than the surface phonetic realisation as the underlying structure. However, such a tone element may, of course, be suppressed before a domain final empty nucleus, as in (13).

(13) Polish:

a. [musk] *mózg*

b. [muzgu] *mózgu* 'brain-NAsg ~ GLsg'

From all the above data, it appears as quite evident that the tone element consistently spreads from the stronger, more complex or more

strongly licensed element, to the weaker, less complex or less strongly licensed element, when two phonological expression with a tone element as its operator are adjacent on the melody tier. Hence, a tone element as an operator spreads both leftwards and rightwards.

5. Sandhi

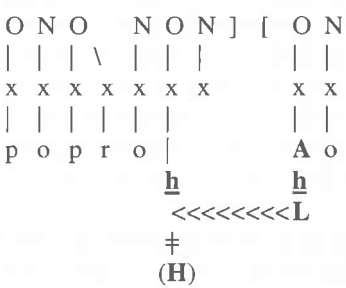
The regressive obstruent assimilation also works across domain boundaries, i.e., in so-called sandhi contexts, resulting in voiceless realization of obstruents word finally before a following word beginning with a voiceless obstruent, and voiced realization of obstruents word finally before a following word beginning with a voiced obstruent.

(14) Czech:

[zʊ**p** zʊb**ɪ**]	*zub zuby*	'tooth-NAsg ~ NAIpl'
[zʊ**p**‿cɛ bɔliː]	*zub tě bolí*	'your tooth aches'
[zʊ**b**‿dal prit͡ʃ]	*zub dal pryč*	'he took the tooth away'
[pɔprɔ**s** pɔprɔ**s**iː]	*popros poprosí*	'ask-imp. ~ fut 3psg/pl'
[pɔprɔ**s**‿pɛtra]	*popros Petra*	'ask Peter'
[pɔprɔ**z**‿ɦɔ]	*popros ho*	'ask him'

This is simply a result of the delinking of the tone elements before an empty nucleus, i.e., when an obstruent occurs word finally, and of the spreading of the element **L** or **H** to the left from the initial obstruent of one word to the final obstruent of a preceding word. The interesting fact here is that domain boundaries apparently are invisible to the elements **L** and **H**.

(15) Czech:
[pɔprɔz‿ɦɔ] *popros ho* 'ask him'



However, if the next word begins with a sonorant or vowel, the situation becomes somewhat more complicated, as will be demonstrated below.

(16) Czech:

[zʊ**p**‿ʊʃ‿jɛ prɪt͡ʃ]	*zub už je pryč*	'the tooth is already gone'
[zʊ**p**‿jɛ zdravi:]	*zub je zdravý*	'the tooth is healthy'
[pɔprɔs‿ɛvʊ]	*popros Evu*	'ask Eve'
[pɔprɔs‿jɪ]	*popros ji*	'ask her'

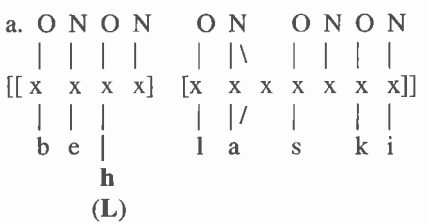
In Czech, a word final obstruent before an empty nucleus may not license its tone element. Such a neutral obstruent is realized as voiceless before words beginning with a vowel or a sonorant. When the following word begins with an obstruent, however, the tone element spreads, as was demonstrated above in (15). Furthermore, primary prepositions are **never** subject to final devoicing before words beginning with a vowel or a sonorant. Simply put, they behave as if word internal. The explanation is that prepositions are incorporated into the domain of a following word. As is shown by the examples in (17), the context preposition + following word is not a sandhi site on par with other contexts, which is explained by a prefixal status of prepositions.

(17) Czech:

[bɛs bzɪ]	*bez ~ bzy*	'lilac-NAsg ~ NAIpl'
[bɛs la:skɪ]	*bez lásky*	'the lilac of love'
[bɛs]	*bez*	'without'
[bɛz‿la:skɪ]	*bez lásky*	'without love'

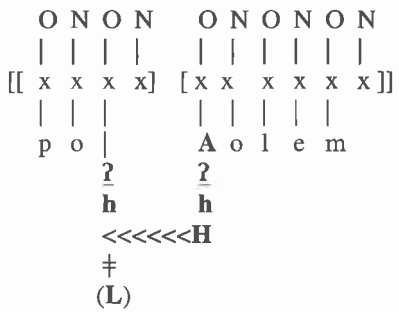
Actually, prepositions are always followed by a domain boundary, constituting an inner domain, incorporated into the domain of the following word (Nilsson 1996). Because this boundary is removed on the second cycle, a final obstruent of a preposition is no longer licensed by a domain final empty nucleus and the supressed tone element may be restored, as in (18).

(18) Czech:
[bɛzla:skɪ] *bez lásky* 'without love'



However, the tone elements **H** and **L** spread from an obstruent to such a preposition without respect to whether there is a domain boundary present or not, as in (19).

(19) Czech:
[pɔtkɔlɛm] *pod kolem* 'under the bicycle'



A further problem is, that in Slovak and Cracow Polish we find a different sandhi. In these languages, any word final obstruent is always pronounced as voiced before a following word beginning with a vowel or a sonorant. The differences are therefore best illustrated in (20), with the word *ves* underlyingly ending in a voiceless obstruent.

(20) Slovak:

[vɛs fsɪ]	*ves ~ vsi*	'village-NAsg ~ GLDsg/NApl'
[vɛz ɔkɔlɔ cɛba]	*ves okolo teba*	'the village around you-sg'
[vɛz ɲɛbɔla]	*ves nebola*	'the village was not'

The phonological principles are however not different in Slovak and Cracow Polish on the one hand, and the rest of the languages on the other. The difference lies simply in the phonetic interpretation of the neutral phonological expression, in which no tone element is licensed. Here, tone is not licensed to be distinctive, and Slovak and Cracow Polish happen to realise the neutral obstruents as voiced in all contexts, except before a pause, whereas the other languages always realise such a neutral obstruent as voiceless. If the following word begins with an obstruent, however, the normal spreading effects will take place.

Finally, in Ukrainian and Serbo-Croatian we do not find any neutralisation of obstruents before a following word beginning with a vowel or a sonorant, as the tone elements **L** and **H** are always licensed by a domain final empty nucleus.

6. Conclusions

The aim of this article is to demonstrate that Slavic phonological voicing phenomena are instances of decomposition, suppression before word final empty nucleus and delinking as an effect of spreading due to the licensing constraint which prevents **L** and **H** from combining. The context in which this happens must be local, in direct adjacency on the melodic tier. *Why* these phenomena take place is a question of elemental complexity and licensing power. A weaker, i.e., less complex or more weakly licensed phonological expression gives in to a stronger, more complex or more strongly licensed expression, which spreads some of its melody to the weaker one.

The following table sums up the principles responsible for voicing alternations in the discussed languages.

	Cz.	Slk.	Pl.	Uk.	SCr.
Tone elements present in the phonological system	L/H	L/H	L/H	L	L/H
L and **H** do not combine	on	on	on	•[8]	on
Domain final empty nuclei do not license **L/H**	on	on	on	off	off
(**L**)/(**H**) are realized as voiceless	on	off	onW	•	•
(**L**)/(**H**) are realized as voiced[9]	off	on	onCr	•	•
L/H as operator is shared with/spread to governee(s)	on	on	on	on	on

This short discussion of voicing alternations in Slavic languages, within the framework of Government Phonology, also demonstrates that language specific ordered rules do not have their place in phonology. All that is needed are universal principles and language specific parameters which tell us whether a certain principle is, or is not, at work in a specific language.

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[8] The dot means that the principle is not relevant in this particular language.

[9] The voiceless pronunciation before a pause is considered a purely phonetic effect.

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