Marijana Marelj (Utrecht U.) and Ora Matushansky (CNRS/U. Paris 8)

AGAINST LENGTH-DETERMINED TONE ASSIGNMENT IN SERBO-CROATIAN

FASL 34, UCSC, May 1–3. 2026

1 SHORT INTRO INTO SERBO-CROATIAN TONE AND STRESS

Browne & McCawley 1973, Inkelas & Zec 1988 (following Jakobson [1937] (1962)), Langston 1997, Zec 1999, Zec & Zsiga 2010, etc.: the position and realization of stress is determined by the word-level position of associated tone (see the appendix for a more detailed exposition)

Summarizing across various formal implementations, tone and stress are linked:

- one stress per phonological word
- in a phonological word, stress is assigned to the leftmost syllable preceding a mora associated with a high tone (H)
- that syllable is also assigned an H
- in the absence of H, the leftmost syllable is assigned both stress and H
- **a long vowel with H on each mora is prohibited** (*[$_{\sigma}$HH]), so the notation [a:^{H}] below actually means [a^{H}a]

What is the status of this H? It could be…

(i) assigned by a rule (like, e.g., obligatory initial stress in Czech)
(ii) associated to a morpheme (floating and linked later)
(iii) linked to a particular syllable/mora/V-slot in a morpheme
(iv) any combination of the above

For all options, but (i): how many H's per word?

2 LINKED AND FLOATING H IN SERBO-CROATIAN

Inkelas & Zec 1988, Zec 1994, 1999, Zec & Zsiga 2010, Simonović & Kager 2020, Simonović 2022, etc.: one H per word, its position is determined by the language system

2.1 Assigned H

In the absence of a lexically specified H in a phonological word, H and stress are assigned to the first syllable:

Representations in parentheses are the traditional representations of length and tone in Serbo-Croatian

(1) a. gla a vu (traditional SC representation *glâvu*)

σ σ
μ μ μ
H

Light prepositions may form part of the phonological word in some dialects of Serbo-Croatian triggering accent shift (see Talić 2019 for one such dialect):

b. u gla a vu (trad. *ù glāvu*) Bidwell 1963:164, regional

σ σ σ
μ μ μ μ
H

Neither the word nor the preposition have their own tone, so H is assigned to the first mora and stress, to the first syllable

When we use moras as TBUs we do not intend this as a theoretical position, it is just for the sake of convenience

This is why falling tones occur only on the first syllable
Bidwell 1963: not true for loanwords, e.g., *lavabò* 'washstand'
Inkelas & Zec 1988:238: spreading may fail in loanwords, e.g., *asistènt* 'assistant', and in adverbs, e.g., *verovàtno* 'likely' or *eventuâlno* 'possibly' (Langston 1997:81)

2.2 Pre-linked H

The existence of a pre-linked H is a matter of debate

Zec 1994: the distribution of H is restricted to the stem-final vowel unless it is long, pre-linked tones are exceptional

What should evidence for a linked H look like:
- fixed position of the tone (no shifting to the prefix or to the suffix)
- preferably not stem-final (excludes all monosyllabic stems) because a fixed stem-final H can be derived from a richer underlying representation

Langston 1997: H linked to non-stem-final syllables is a productive feature of Serbo-Croatian

(2) a. gla^{H}gol (trad. *glàgol*) 'verb', ja^{H}buka (trad. *jàbuka*) 'apple' native
b. ambasa:^{H}dor (trad. *ambàsādor*), pozi:^{H}cija (trad. *pòzīcija*) loan

Penultimate pre-linked H seems extremely rare in native Slavic vocabulary
But native underived roots rarely exceed one syllable

Derived stems may end up with a linked H, of course

> Most analyses of Serbo-Croatian tone we have seen do not make use of pre-linked tones

2.3 Associated non-linked H

Serbo-Croatian has the equivalent of Russian post-accenting morphemes: H appears on the first syllable of the inflection if present, on the last syllable of the stem otherwise:

(3) a. ju na a k-a (trad. *junáka* 'hero.SG.GEN')
σ σ σ
μ μ μ μ
|
H

b. ju na ak (trad. *jùnāk* 'hero.SG.NOM')
σ σ
μ μ μ
|
H

Inkelas & Zec 1988, Zec 1994, 1999, Zec & Zsiga 2010, Simonović & Kager 2020, Simonović 2022, etc.: the stem-final position of H is determined by the language system

> Zec 1994: there are no stems that have an H linked to a final long syllable

= **stems whose stem-final vowel is long are like** (3)

Hypothesis: an underived stem may come with a floating H, which must be assigned (linked), but not to a long vowel

H cannot be assigned to a long vowel

H can be spread or retracted onto a long vowel, as we will see below

Rhetoric:

Q: If tones are specified lexically, how come there are no words with a tone-bearing stem-final long vowel?

A: **The location of the tone is not lexically given**

(4) Inkelas & Zec 1988
In a derived environment, assign H to the first syllable of the suffix if the stem-final syllable is long, otherwise to the stem-final syllable

(5) Zec 1994
a. only those moras that act as syllable heads are assigned tonal nodes
b. link the floating tone to the rightmost mora of the stem linked to a tonal node

(6) Zec 1999
H aligns with the rightmost mora of a morpheme (stem), unless it is the second mora of a long vowel (in which case H aligns with the next syllable, i.e., links to the suffix)

Also Simonović 2022, Becker 2007…
Zec & Zsiga 2010, Zec 2024 appear to abandon this assumption

So, stems that might have looked like having a lexically specified final H can be analyzed along the same lines as stems with a floating H (H always assigned to the final syllable)

Putative empirical generalization: for a stem associated with a (floating) H:

- if the stem-final vowel is long, the tone is linked to the suffix
- if the stem-final vowel is short, the tone is linked to it

Consistent final H ⇔ a long stem-final vowel (3), otherwise fixed stem-final H

Langston 1997: this empirical generalization is incorrect; there are "hundreds" of native post-accenting stems with a short stem-final syllable:

(7) a. bo^{H}b/boba^{H} (trad. *bȍb/bòba*) 'bean.NOM/GEN' masculine
b. mudra^{H}c/mudraca^{H} (trad. *mùdrac/mudràca*) 'wise man.NOM/GEN'
c. borba^{H}/borbu^{H} (trad. *bòrba/bòrbu*) 'battle.NOM/ACC' feminine
d. poljana^{H}/poljanu^{H} (trad. *poljàna/poljànu*) 'meadow.NOM/ACC'
e. čelo^{H} (trad. *čèlo*) 'forehead', gospodstvo^{H} (trad. *gospòdstvo*) 'reign' neuter

In other words, an inflectional H need not be due to a long stem-final vowel
Zec 1994: in these stems the H tone is "extraprosodic" until the next cycle

Furthermore, **a long stem-final vowel is quite compatible with bearing an H**, very clear for C-final nouns:

(8) masculine C-final nouns with a long stem-final vowel Barić et al. 1997:120
a. cr:^{H}v/cr:^{H}va (trad. *crȋv/crȋva*) 'worm.NOM/GEN'
b. vu:^{H}k/vu:^{H}ka (trad. *vȗk/vûka*) 'wolf.NOM/GEN'

(9) feminine C-final nouns a long stem-final vowel
a. sla:^{H}st/sla:^{H}sti (trad. *slâst/slâsti*) 'sweetness.NOM/GEN' Stevanović 1964
b. ka:^{H}p/ka:^{H}pi (trad. *kâp/kâpi*) 'drop.NOM/GEN' Barić et al. 1997:169

Langston 1997: a morpheme can have a pre-linked H, a floating H or no H

3 INTERMEDIATE SUMMARY

Two approaches to Serbo-Croatian H:

- lexical: accented, unaccented and post-accenting morphemes (H can be pre-linked, absent or floating)
- assigned: associated H that is always assigned, position depending on the length of the stem-final vowel

Problems with the non-lexical account: unexpected stem-penultimate H, lack of a claimed link between stem-final vowel length and stem-final H

Verbal accentuation also requires a three-way distinction between morphemes

Crucially, more than one morpheme can be associated with a (floating) H

4 VERBAL ACCENT SHIFTS

Main accentual paradigms: athematic (≈C-final, non-productive) vs. thematic (≈V-final) verbal stems
We will **start with thematic verbal stems**

Main accentual opposition: **the infinitive vs. the present tense**
The same accentuation as in the present tense: imperfect and maybe present-tense gerund
There is also the aorist 2/3SG forms, which are unaccented (H on the first syllable), and there are some interesting quirks within the present tense, and participles do not all behave the same, but these are irrelevant for now

Table 1: Accentual alternations in the *i*-verb class (short stem-final vowel)

	post-stem H **lomiti 'break.IPFV'**	**retraction** **moliti 'pray.IPFV'**	**stem-final H** **nuditi 'offer.IPFV'**
INF	lomi^{H}ti (*lòmiti*)	moli^{H}ti (*mòliti*)	nu^{H}diti (*nȕditi*)
PRS.3SG	lomi^{H}i (*lòmī*)	mo^{H}lii (*mȍlī*)	nu^{H}dii (*nȕdī*)

The fact that in thematic verbs H never shifts to the prefix suggests that thematic verbal stems are never underlyingly toneless

4.1 Present-tense retraction via vowel deletion

Zec 1994, Langston 1997: tone shift is linked to the deletion of the tone-bearing thematic suffix

In both approaches, the present-tense inflection is vocalic:

(10) a. pev-a-aam 'sing-TH-PRES.1SG' → pev-aam
b. vol-e-iim 'love-TH-PRES.1SG' → vol-iim
c. misl-i-iim 'think-TH-PRES.1SG' → misl-iim

Vowel-before-vowel deletion is independently motivated in Slavic (Jakobson 1948)
Assuming that the thematic suffix bears an H, its deletion forces the H to retract to the stem

Shared problem: non-retracting stems, resolved by assuming that these stems are toneless
With additional assumptions: L: the thematic H is a floating one (see 6.3), Z: it is also extraprosodic here(?)

4.2 Present-tense retraction via constraint on long vowels

Simonović 2022, focusing on *i/i* verbs: tone-shift to the stem-final vowel is linked to the fact that the thematic vowel is lengthened

The present-tense suffix is a mora
This can be extended to *a/a*-verbs and in a pinch, to *e/i*-verbs, but not to C-final and *nu/ne*-verbs

The distinction between the three verb classes is due to the nature of H on the theme vowel

Table 2: Accentual alternations in the *i/i* class (Simonović)

	prelinked H **lomiti 'break.IPFV'**	**floating H** **moliti 'pray.IPFV'**	**epenthetic H** **nuditi 'offer.IPFV'**
UR	/lom-i^{H}/	/mol-i$^{—H}$/	/nud-i/
INF	lomi^{H}ti (*lòmiti*)	moli^{H}ti (*mòliti*)	nu^{H}diti (*núditi*)
PRS.3SG (a mora)	lomi:^{H}	mo^{H}lii	nu^{H}dii

The H can be pre-linked to the thematic suffix *-i-*, floating on it, or inserted by a special process (cf. Zec's work)

Simonović 2022: "all [*i*-]verbs that require the specification of a lexical H somewhere before the stem-final syllable are denominal or deadjectival" (p.3)

Present-tense retraction is due to a violable "parochial constraint":

(11) *H-LongTheme: Assign a violation mark for every long theme vowel associated with a H.

If the present-tense suffix is a mora, it accounts for the lengthening of the theme vowel, except in verbs with a "pre-linked H" on the theme vowel, where it is preserved by IDENT-LINK

Non-theme vowels are not covered by the "parochial constraint" (11) and hence can bear H

Importantly, **Simonović also discusses passive past participles** (which uniformly shift the H to the stem-final vowel) **and deverbal nouns** (which permit H on a long vowel)

Problem: three allomorphs of the theme vowel are needed, and the same three accentual classes exist for *a*-verbs (Barić et al. 1997:261–265)
Barić et al. 1997 is Croatian, Stevanović 1964 is Serbian; when they disagree, this is explicitly indicated. In the table below, the alternation between [h] and [*v*] corresponds to the Croatian/Serbian divide, respectively

Table 3: Accentual alternations in the *a/a* class

	post-stem H **jačati 'strengthen.IPFV'**	**retraction** **igrati 'play.IPFV'**	**stem-final H** **kuhatic/kuvatis 'wear.IPFV'**
INF	jača^{H}ti (*jàčati*)	igra^{H}ti (*ìgrati*)	ku^{H}hati/ku^{H}vati (*kùhati*/*kùvati*)
PRS.3SG	jača:^{H} (*jàčā*)	i^{H}graa (*ìgrā*)	ku^{H}haa/ku^{H}vaa (*kùhā*/*kùvā*)

Since thematic suffixes are the same across different accentual classes, retraction must be due to the properties of the root

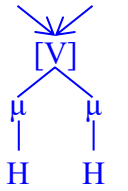
Theoretical problem: there is **no motivation for the "parochial constraint" in (11)**

5 ANALYSIS

Main intuition: what is prohibited (independently) in Serbo-Croatian is a long vowel with level tone, i.e., *[σHH]

If the present-tense suffix and the thematic suffix are both linked to an H, an illicit configuration arises:

(12) * √ TH PRES



Long vowels can never be specified as H on both moras

This is reasonable grounds for H-retraction

The root can have no H (unaccented), a linked H (accented), or a floating H (post-accenting), cf. Langston 1997:

(13) a. lom- b. nud- c. mol-

H H

Suffixes can also belong to the same three accentual types (but in fact, we will only see two):

- the thematic suffixes *-a-* and *-i-* introduce a floating H
- the thematic suffixes *-nu-* and *-a-*/*-i-*, and the present-tense suffix have a linked H
- the thematic suffix *-e-*/*-i-* is special

Independent motivation for H on the theme:

- in thematic verbs H does not shift to the prefix (hence the theme has an H)
- same for the present tense of C-final (athematic) verbs (so the present-tense suffix also has an H)

Starting point: C-final verbs, which do not have a thematic suffix, hence no additional H's

5.1 Accentuation of C-final verbs

C-final verbs exhibit a type of accentual alternation that is not attested with thematic verbs

Table 4: Accentual alternations in the C-final verb class

	post-stem H **peći 'bake.IPFV'**	**"reverse retraction"** **plesti 'knit.IPFV'**	**stem-final H** **jesti 'eat.IPFV'**
INF	peći^{H} (*pèći*)	ple^{H}sti (*plèsti*)	je^{H}sti (*jȅsti*)
PRS.3SG	peče^{H}(e) (*pècē/pèce*)	plete^{H}(e) (*plètē/plète*)	je^{H}de(e) (*jȅdē/jȅde*)
root	*-pek-*	*-plet-*	*-jed-*

There is no retraction in the present tense (exponent *-e-* or *-ē-*)

Its surface form might reflect its historical development or dialectal differences (*-e:-* is found in both Barić et al. 1997 (Croatian) and in Stevanović 1964 (Serbian); the short variant, *-e-*, is only found in Barić et al. 1997)

The post-stem vowel in the present tense of C-final verbs is also long

Assuming the same three accentual types (no H, H and floating H), the length of the post-stem vowel is not the decisive factor
Though, of course, the post-stem vowel in C-final verbs is not a theme vowel; a theory of present-tense exponence is needed

5.1.1 Systematic stem H (*jȅsti* 'to eat')

Systematic stem H is clearly due to a linked H (accented root)

5.1.2 Alternating H (*plȅsti* 'to knit')

Variable H diagnoses a root with no H **on the assumption that the present-tense suffix has a linked H** and the infinitive suffix is toneless

5.1.3 Post-stem H (*pèći* 'to bake')

A root with a floating H places H on the infinitive suffix and does not conflict with the H of the present-tense suffix

No retraction

5.2 Thematic verbs with the present tense exponent *-e-*

Two conjugation classes: *-nu-*/*-ne-* and *-a-*/*-i-* (*pisati/pišem*)
The hypothesis that the latter involves a2i ablaut (of sorts) is due to Bethin 1992, see also Matushansky 2025

The thematic suffix *-nu-* does not create verbs with systematic post-stem H

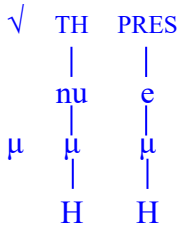
Table 5: Accentual alternations in the *nu/ne* class

	retracting H **vènuti 'wither.IPFV'**	**stem H** **dȉgnuti 'push.PFV'**
INF	venu^{H}ti (*vènuti*)	di^{H}gnuti (*dȉgnuti*)
PRS.3SG	ve^{H}nee (*vènē*)	di^{H}gnee (*dȉgnē*)

Two options only, no *nu*-verbs with the H tone staying on the theme
For a long stem-final vowel, only the stem H pattern is attested (e.g., *vîknuti*), no other patterns mentioned (Barić et al. 1997:256–257)

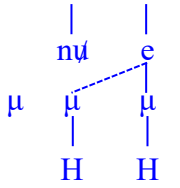
Proposal: the thematic suffix *-nu-* has a linked H

(14) a.



Jakobson 1948, Zec 1994, Langston 1997: vowel-before-vowel deletion (*-nu-* + *-e-*):
Perhaps this is glide formation, with the deletion of the resulting [w]

b. * √ TH PRES



If the mora of the deleted vowel were relinked to the next vocalic slot, the illicit configuration in (12) would be created

Hence retraction

A root with a floating H or no H would yield post-stem H in the infinitive (*vènuti* 'to wither'), a root with a linked H will yield stem H in the entire paradigm (hence *dȉgnuti* 'to push' could be either)

The same accentual picture is observed in the *a/i*-class

Table 6: Accentual alternations in the *a/i*-class

	retracting H **mètati 'throw.IPFV'**	**stem H** **dȉgnuti 'push.PFV'**
INF	meta^{H}ti (*mètati*)	ma^{H}zati (*mȁzati*)
PRS.3SG	me^{H}ćee (*mȅćē*) < me^{H}tjee	ma^{H}žee (*mȁžē*) < ma^{H}zjee

Glide formation leads to consonant mutation (aka iotation), otherwise the treatment is the same

Thematic vowels with a linked H always trigger retraction in the present tense and neutralize roots that do not have a linked H in the infinitive

5.3 *a/a*-verbs, *i*-verbs

Like *i*-verbs (Table 1), *a*-verbs exhibit exactly the same accentual patterns (Table 3)

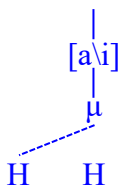
Proposal: the theme suffixes *-i-* and *-a-* are affiliated with a floating H

The present-tense suffix has a linked H, as before, but no segmental content, as per Simonović 2022

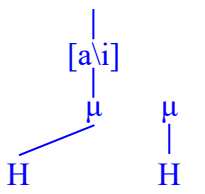
5.3.1 Roots with a floating H (*mòliti* 'to pray', *ìgrati* 'to play')

The floating H of a root is linked to the theme vowel:

(15) a. √ TH

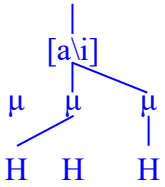


b. √ TH PRES



If the present-tense mora linked to the theme vowel, an illicit configuration would arise:

c. * √ TH PRES



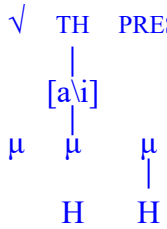
This triggers H-retraction, just like in (12) and (14), it's the same configuration

5.3.2 Roots without an H (*lòmiti* 'to break', *jàčati* 'strengthen')

What happens to the H that cannot link to the right?

Detectable only with a toneless root:

(16) √ TH PRES



What we want to achieve is that the thematic H is not linked and the tone remains after the root in the present tense

Since this is not the same configuration as in (12), the floating H is simply deleted

The difference between (12) and (16) is that in (12) H is linked, and in (16) it is not

5.3.3 Roots with a linked H (*núditi* 'to offer', *kùhati*$_C$/ *kùvati*$_S$ 'to wear')

The same reasoning will apply, but the linked H on the root will obscure it

6 CONCLUSION AND REMAINING ISSUES

Main hypothesis: tone retraction occurs when phonological changes (deletion or gliding of an H-linked vowel, mora linking) create an illicit HH sequence within one syllable

Tonal specification of roots and affixes is needed anyway:

- linked H: present-tense suffixes, *-nu-* and *-a-*/*-i-* thematic suffixes
- floating H: *-a-* and *-i-* thematic suffixes
- no H: the infinitive suffix *-ti-*
- all three options for verbal roots

Different routes to the illicit configuration:

- deletion or gliding of a vowel with a linked H
- floating H on a root plus an H-bearing mora

Nagging intuition: the different ways of forming the long post-stem vowel for thematic suffixes might provide a better analysis

Several loose ends remain

6.1 Vowel change in *e/i*-verbs

Could the raising of the thematic vowel in the present tense of *e/i*-verbs correlate with the lack of the retraction pattern?

Table 7: Accentual alternations in the *e/i* class

	post-stem H **žèleti/žèljeti 'want.IPFV'**	**stem H** **vȉdeti/vȉdjeti 'see.IPFV'**
INF	žele^{H}ti (*žèleti*)	vi^{H}deti (*vȉdeti*)
PRS.3SG	želi:^{H} (*žèlī*)	vi^{H}di: (*vȉdī*)

Two options only, no *e/i*-verbs with a variable position of the H

Which means that the illicit configuration never arises. How come? Two options:

- the theme *e/i* assigns H to the preceding syllable (novel accentual type, undesirable)
  additional assumption needed: a stem with a floating H wins
- the theme *e/i* has a linked H, but the present-tense suffix has no H (third allomorph, note the segmental change)
  alternative option: the H of the present-tense suffix is what forces e2i in this class avoiding HH

Once again, the segmental change seems to interact with the position of H

6.2 3PL of *a*-verbs

Table 8: Present-tense conjugation in the *a/a* class

peva^{H}a-ti (*pèv-a-ti*) 'to sing'	**singular**	**plural**
1	pe^{H}vaa-m (*pȅv-ā-m*)	pe^{H}vaa-mo (*pȅv-ā-mo*)
2	pe^{H}vaa-š (*pȅv-ā-š*)	pe^{H}vaa-te (*pȅv-ā-te*)
3	pe^{H}vaa (*pȅv-ā*)	peva^{H}j-uu (*pèv-aj-ū*)

The 3PL cell in the *a*-class does not undergo lengthening and the tone is not shifted to the stem

Two potential options:

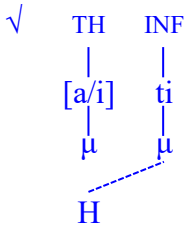
- à-la Zec & Langston: the 3PL suffix of *a*-verbs is non-vocalic, hence no deletion
- à-la Simonović: the underlying empty mora of the present-tense suffix is realized as [j] intervocalically, hence no long theme vowel

The actual solution will depend on the proper treatment of the present-tense exponence

6.3 Wrong prediction: infinitives

If the root is unaccented, the H of the theme vowel is wrongly predicted to link to the infinitival suffix (*lomiti^{H} instead of lomi^{H}ti (*lòmiti*) 'to break'):

(17)



Which means that we need to introduce an additional assumption preventing this

How about the following analysis of unaccented, accented, and post-accenting morphemes:

- accented is normal: H linked to a particular syllable
- unaccented and post-accenting: no H (cf. Alderete 1999)
  - unaccented: at the next cycle X+1 if no H is present, assign H to X's leftmost syllable
  - post-accenting: at the next cycle X+1 assign H to X's **rightmost** syllable (if no H is present? see next section 6.4)

This creates a distinction between nominal post-accentuation (3) and verbal post-accentuation (17): as nominal suffixes end in a consonant, their rightmost syllable will

Remains to be solved: the theoretical underpinnings of this distinction in linking between non-accented morphemes

6.4 How far can an H float?

The proposed analysis of a sequence of two floating tones places the stress before the first one, is this how it works in nouns?
In Russian, a sequence of two post-accenting morphemes yields stress after the second one

Appendix A SHORT INTRO INTO SERBO-CROATIAN TONE AND STRESS

Surface realization of stress depends on vowel length and tone

Browne & McCawley 1973, Inkelas & Zec 1988 (following Jakobson [1937] (1962)), Langston 1997, Zec 1999, Zec & Zsiga 2010, etc.: stress, tone and length are separate properties

Summarizing across various formal implementations, tone and stress are linked:

- tone (H) is a property of the first mora of a syllable
- H spreads to the preceding mora (but never within one syllable)
- within a phonological word, stress is assigned to the leftmost syllable containing a high-toned mora (fully predictable from tone, one per word)
- in the absence of H, the leftmost syllable is assigned both stress and H

Four traditional diacritics and their analysis (bold indicates the original position of the tone, underlining indicates the position of the surface stress):

(18) a. Long Falling (ô): zâsta va 'flag' (no spreading, word-initial only) I&Z1988
zâstava
μμ μ μ
HLL L

b. Short Falling (ȍ): jȅ ze ro 'lake' (no spreading, word-initial only)
jȅzero
μ μ μ
H L L

c. Long Rising (ó): ráz li ka ‘difference’ (H spreads to the preceding long σ)
rázlika μμ μ μ
LH**H** L

d. Short Rising (ò): pàp ri ka ‘pepper’ (H spreads to the preceding short σ)
pàprika μ μ μ
H **H** L

On the surface there is only one stress per word, assigned to the leftmost syllable bearing H

Derivation:

(19) a. pap ri ka
σ σ σ
μ μ μ
|
H
tone is linked

b. pap ri ka
σ σ σ
μ μ μ
\ |
H
tone spreads

c. pap ri ka
σ σ σ
μ μ μ
\ |
H
stress is assigned

Same with long vowels:

(20) a. ra:z li ka
σ σ σ
μμ μ μ
|
H
tone is linked

b. ra:z li ka
σ σ σ
μμ μ μ
\ |
H
tone spreads

b. ra:z li ka
σ σ σ
μμ μ μ
\ |
H
stress is assigned

Zec & Zsiga 2010: stress is assigned as far left as possible and as close to the lexically specified H; the second H is inserted at stress

With long vowels two linking options are possible: HL and LH:
- LH on a long vowel is possible only as a result of stress-linked spreading
- HL on a long vowel is only possible otherwise
- HH is impossible

Why?

Inkelas & Zec 1988: an H cannot be linked to the second mora of a syllable (because tones are assigned to syllables but spread over moras)

Zec 1994: tones are assigned to those moras that act as heads of the syllable

Summary:
- H spreads to the preceding mora if it can
- stress is assigned to the leftmost H
- the two moras of a long vowel cannot both bear H

Various analytic possibilities of accounting for this have been explored, in function of what is supposed to be the TBU (tone-bearing unit) in Serbo-Croatian

REFERENCES

Alderete, John D. 1999. Morphologically Governed Accent in Optimality Theory. Doctoral dissertation, Rutgers University.

Barić, Eugenija & Lončarić, Mijo & Malić, Dragica & Pavešić, Slavko & Peti, Mirko & Zečević, Vesna & Znika, Marija. 1997. *Hrvatska gramatika*. Zagreb: Školska knjiga.
Becker, Michael. 2007. Tone licensing and categorical alignment in Serbo-Croatian. In Bateman, Leah & O'Keefe, Michael & Reilly, Ehren & Werle, Adam (eds.). *Occasional Papers in Linguistics 32: Papers in Optimality Theory III*, 1–19. Amherst, MA: GLSA.
Bethin, Christina Y. 1992. Iotation and gemination in Ukrainian. *The Slavic and East European Journal* 36 (3), 275–301.
Bidwell, Charles E. 1963. The phonemics and morphophonemics of Serbo-Croatian stress. *The Slavic and East European Journal* 7 (2), 160–165. https://doi.org/10.2307/304608.
Browne, Wayles E. & McCawley, James D. 1973. Serbo-Croatian accent. In Fudge, Erik C. (ed.). *Phonology*, 330–335. Harmondsworth: Penguin.
Inkelas, Sharon & Zec, Draga. 1988. Serbo-Croatian pitch accent: the interaction of tone, stress, and intonation. *Language* 64 (2), 227–248. https://doi.org/10.2307/415433.
Jakobson, Roman. 1948. Russian conjugation. *Word* 4, 155–167.
Jakobson, Roman. [1937] (1962). On the identification of phonemic entities. In *Selected Writings I*, 418–425. The Hague: Mouton.
Langston, Keith. 1997. Pitch Accent in Croatian and Serbian: Towards an Autosegmental Analysis. *Journal of Slavic Linguistics* 5 (1), 80–116, http://www.jstor.org/stable/24599009.
Matushansky, Ora. 2025. Russian *e*-verbs and thematic vowel change. *Journal of Slavic Linguistics* 33 (FASL 32), 1–19. https://doi.org/https://ojs.ung.si/index.php/JSL/article/view/553.
Simonović, Marko. 2022. Neo-Štokavian deverbal *je*-nominalisations contain passive participles. *Journal of Slavic Linguistics* 30 (FASL 29 extra issue), 1–13, https://ojs.ung.si/index.php/JSL/article/view/91.
Simonović, Marko & Kager, René. 2020. Serbo-Croatian is developing stem-based prosody. Why so? In Marušič, Franc & Mišmaš, Petra & Žaucer, Rok (eds.). *Advances in Formal Slavic Linguistics 2017*, 305–322. Berlin: Language Science Press. https://doi.org/10.5281/zenodo.376486.
Stevanović, Mihailo. 1964. *Savremeni srpskohrvatski jezik: Uvod, fonetika, morfologija*. Beograd: Naučno delo.
Talić, Aida. 2019. Upward P-cliticization, accent shift, and extraction out of PP. *Natural Language & Linguistic Theory* 37 (3), 1103-1143. https://doi.org/10.1007/s11049-018-9424-1.
Zec, Draga. 1994. *Sonority constraints on prosodic structure*. New York: Garland Publishing.
Zec, Draga. 1999. Footed tones and tonal feet: rhythmic constituency in a pitch-accent language. *Phonology* 16 (2), 225–264, http://www.jstor.org/stable/4420150.
Zec, Draga. 2024. Word stress. In Šipka, Danko & Browne, Wayles (eds.). *The Cambridge Handbook of Slavic Linguistics*, 9–28. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781108973021.002.
Zec, Draga & Zsiga, Elisabeth. 2010. Interaction of stress and tone in Standard Serbian. In Browne, Wayles & Cooper, Adam & Fisher, Alison & Kesicie, Esra & Predolac, Nikola & Zec, Draga (eds.). *Proceedings of the Formal Approaches to Slavic Linguistics 18 (FASL 18): The Second Cornell Meeting*, 535–555. Ann Arbor, Michigan: Michigan Slavic Publications.