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PHONOTACTIC DIFFERENCES BETWEEN ENGLISH AND BOSNIAN/CROATIAN/SERBIAN: A DEPENDENCY PHONOLOGY APPROACH TO "ONSETS"

Summary

This paper gives an overview of consonant pairs that may or may not appear in onsets of English and Bosnian/Croatian/Serbian syllables, focusing on pairs that are allowed in one language, but impossible in the other. It also provides a possible explanation of the fact that the number of permitted pairs is vastly larger in BCS compared to English; and it shows how some pairs that seem exceptional with respect to the Sonority Principle (Clemens 1992) can be reanalyzed and justified in the light of Dependency phonology (van der Hulst 2011, Ritter 2006 & Charette 2003). Finally, it illustrates that some words in BCS that contain 'the syllabic /r/' cannot be covered by the Dependency phonology framework unless a couple of additional assumptions are made.

Key words: *Onset, Rhyme, the Sonority Principle, minimal sonority distance, license, syllabic /r/*

Sažetak

Ovaj rad daje pregled dozvoljenih i nedozvoljenih parova suglasnika na početku engleskih i bosanskih/hrvatskih/srpskih slogova (u 'onsetu'), poklanjajući posebnu pažnju parovima koji su dozvoljeni u jednom, a nisu u drugom jeziku. Pored toga se pokušava objasniti zašto je broj dozvoljenih parova značajno veći u b/h/s jeziku nego u engleskom jeziku, kao i pokazati kako se uz pomoć 'fonologije zavisnih odnosa' (van der Hulst 2011, Ritter 2006 i Charette 2003) mogu objasniti neki parovi koji, naizgled, odstupaju od 'principa sonornosti' (Clemens 1992). Završni dio rada pokazuje da je potrebno nekoliko dodatnih pretpostavki da bi se ovom teorijom mogle objasniti riječi iz b/h/s jezika koje sadrže slogotvorno /r/.

1. Introduction

1.1. Units and licensing of marked constituents

Two fundamental units of phonotactic representation in Dependency/Government phonology (van der Hulst – 2011, Ritter 2006 & Charette 2003) are Onset (O) and Rhyme (R), i.e. words are assumed to be sequences of Os and Rs. Onsets and rhymes can consist of a single, or more than one phoneme (I will refer to this as 'branching'.). Both of these units have heads, and these are their left-most segments. In some cases the head of the R can be

left empty. The unmarked case is the situation where these units contain a single segment (phoneme); both 'branching' and 'empty-headedness' need to be licensed by another element in the word. Neither Os nor Rs can have more than two segments. The head of the Onset is typically the least sonorous segment, an obstruent; however, in the absence of an obstruent, another consonant can fill this position. On the other hand, the most sonorous segment (the vowel) is the head of the Rhyme, and under this approach only a vowel can appear in this position, or it can remain empty under certain conditions. Even though there are notions such as 'syllabic consonants' in the literature on phonology, they are not placed into the head position of the Rhyme under this account.

As mentioned above, marked units ('empty-headed Rs', and 'branching Os and Rs') cannot exist unless they are licensed by other units in the representation of the word. Below is a list of basic rules of licensing (van der Hulst 2011):

(1) *a*- An empty-headed R must be followed by a contentful O and a contentful R, unless this R is word-final, in which case it is allowed by 'final licensing'.
b- Branching Rs that end in a coda consonant must be fol lowed by a contentful R.
c- In addition to (b) above, a branching R must also be fol lowed by a contentful O, which is considered to be "Coda li censing".
d- Branching Rs with long vowels do not have to be followed by an overt O.
e- Branching Os do not have to be followed by an overt O.
f- The head of a branching O has to be governed by the fol lowing R to be able to license its sister (the dependant).

1.2. Sonority and syllabification

Traditionally, words are assumed to consist of syllables that are further split into onsets and rhymes. Consonants at the beginning of a syllable represent the onset, while the rhyme consists of the nucleus, which accommodates the vowel in the syllable, and the Coda, which accommodates consonants at the end of the syllable (if there are any). What determines the organization of segments within the syllable, according to Clemens (1992), is the Sonority

Cycle. Segments are ranked based on their degree of sonority; they are more or less sonorous (see table in (2)). Those segments that are more sonorous appear closer to the syllable peak, so vowels, as the most sonorous segments, are placed in the head of the rhyme (i.e. the syllable peak = nucleus), while consonants are ordered within the onset in such a way that the least sonorous consonants come first, and those that are more sonorous are closer to the nucleus. Clemens (1992, p.65) classifies segments into four classes with respect to sonority:

(2)

	Glide	Liquid	Nasal	Obstruent
vocoid	+	-	-	-
approximant	+	+	-	-
sonorant	+	+	+	-
sonority scale	3	2	1	0

Some authors make a further distinction, and place plosives and fricatives at different levels on the sonority scale (Radford et al. 2009). Another important restriction in the syllable structure concerns the syllable boundary. In fact, when words are split into syllables, those places that contain consonant clusters are broken in such a way that consonants are placed into the onset rather than into the rhyme (i.e. coda) of the preceding syllable. This tendency is formalized as the *Maximal Onset Principle* (Selkirk 1982). Within the onset, consonants are combined in a way that they also tend to be separated by a *minimal sonority distance* (Clemens 1992), i.e. they are not followed by consonants from the immediately following group on the sonority scale, but rather from the one after that. For example, *Obstruent+Liquid* constitutes a good onset cluster, while *Obstruent+Nasal*, or *Nasal+Liquid* do not.

2. "Onset" clusters in English and Bosnian/Croatian/Serbian

In this section I will present possible consonant pairs in "onsets"[1] in English and BCS. The two tables on the following pages present all theoretically possible combinations of two consonants in English and BCS. Black cells represent combinations that are excluded by the Sonority Principle. Grey cells represent combinations that exist in these two languages. Pairs of two identical consonants can be ignored (cells with the diagonal pattern)

[1] The word onset here refers to what is traditionally considered to be an onset. However, as it will be illustrated, many consonant pairs that can appear initially in words in these two languages violate the Sonority principle, especially in BCS, so these pairs need to be reanalyzed.

because when it happens that some morphological and/or phonological process creates a word with two identical consonants side by side, one of them is dropped, as in the word *bešuman – 'silent'* in BCS*: /bez+ʃuman/ > /beʒ+ʃuman/ (place assimilation: z->ʒ) > /beʃ+ʃuman/ (voicing assimilation: ʒ->ʃ) > /beʃuman/ (ʃʃ->ʃ).*

Unacceptable combinations in white cells (see Table 1&2) are those that are not excluded by the Sonority principle, but for which I did not find examples.

Summary of consonant pairs:	English	BCS
Theoretically possible	**552**	**600**
Ignored	24	25
Unacceptable	511	496
Excluded by Sonority Principle	350	358
Acceptable	41	104

As we can see from this summary of numbers of allowed and disallowed combinations of consonants at the beginning of the word, BCS has a considerably larger variety of combinations than English. Both languages have consonants that do not exist in the other language[2]. It is true that BCS has more theoretically possible combinations because it has one consonant more than English, but the consonants that are present only in the BCS inventory do not contribute a lot to the number of acceptable combinations, so the difference between these two languages with respect to 'onset' clusters is indeed significant.

[2] English consonants absent in BCS:/θ, ð, ŋ, v/, BCS consonants absent in English:/ ts, tɕ, dʑ, ɲ, ʎ/. – Note: BCS /v/ is not a fricative but an approximant.

Table 1: Possible combinations of two **English** consonants in an onset

pp	bp	tp	dp	kp	gp	ʧp	ʤp	fp	vp	sp	zp	θp	ðp	ʃp	ʒp	hp	mp	np	ŋp	lp	rp	wp	jp
pb	bb	tb	db	kb	gb	ʧb	ʤb	fb	vb	sb	zb	θb	ðb	ʃb	ʒb	hb	mb	nb	ŋb	lb	rb	wb	jb
pt	bt	tt	dt	kt	gt	ʧt	ʤt	ft	vt	st	zt	θt	ðt	ʃt	ʒt	ht	mt	nt	ŋt	lt	rt	wt	jt
pd	bd	td	dd	kd	gd	ʧd	ʤd	fd	vd	sd	zd	θd	ðd	ʃd	ʒd	hd	md	nd	ŋd	ld	rd	wd	jd
pk	bk	tk	dk	kk	gk	ʧk	ʤk	fk	vk	sk	zk	θk	ðk	ʃk	ʒk	hk	mk	nk	ŋk	lk	rk	wk	jk
pg	bg	tg	dg	kg	gg	ʧg	ʤg	fg	vg	sg	zg	θg	ðg	ʃg	ʒg	hg	mg	ng	ŋg	lg	rg	wg	jg
ptʃ	btʃ	ttʃ	dtʃ	ktʃ	gtʃ	ʧʧ	ʤtʃ	ftʃ	vtʃ	stʃ	ztʃ	θtʃ	ðtʃ	ʃtʃ	ʒtʃ	htʃ	mtʃ	ntʃ	ŋtʃ	ltʃ	rtʃ	wtʃ	jtʃ
pd3	bd3	td3	dd3	kd3	gd3	ʧd3	ʤdʒ	fd3	vd3	sd3	zd3	θd3	ðd3	ʃd3	ʒd3	hd3	md3	nd3	ŋd3	ld3	rd3	wd3	jd3
pf	bf	tf	df	kf	gf	ʧf	ʤf	ff	vf	sf	zf	θf	ðf	ʃf	ʒf	hf	mf	nf	ŋf	lf	rf	wf	jf
pv	bv	tv	dv	kv	gv	ʧv	ʤv	fv	vv	sv	zv	θv	ðv	ʃv	ʒv	hv	mv	nv	ŋv	lv	rv	wv	jv
ps	bs	ts	ds	ks	gs	ʧs	ʤs	fs	vs	ss	zs	θs	ðs	ʃs	ʒs	hs	ms	ns	ŋs	ls	rs	ws	js
pz	bz	tz	dz	kz	gz	ʧz	ʤz	fz	vz	sz	zz	θz	ðz	ʃz	ʒz	hz	mz	nz	ŋz	lz	rz	wz	jz
pθ	bθ	tθ	dθ	kθ	gθ	ʧθ	ʤθ	fθ	vθ	sθ	zθ	θθ	ðθ	ʃθ	ʒθ	hθ	mθ	nθ	ŋθ	lθ	rθ	wθ	jθ
pð	bð	tð	dð	kð	gð	ʧð	ʤð	fð	vð	sð	zð	θð	ðð	ʃð	ʒð	hð	mð	nð	ŋð	lð	rð	wð	jð
pʃ	bʃ	tʃ	dʃ	kʃ	gʃ	ʧʃ	ʤʃ	fʃ	vʃ	sʃ	zʃ	θʃ	ðʃ	ʃʃ	ʒʃ	hʃ	mʃ	nʃ	ŋʃ	lʃ	rʃ	wʃ	jʃ
pʒ	bʒ	tʒ	dʒ	kʒ	gʒ	ʧʒ	ʤʒ	fʒ	vʒ	sʒ	zʒ	θʒ	ðʒ	ʃʒ	ʒʒ	hʒ	mʒ	nʒ	ŋʒ	lʒ	rʒ	wʒ	jʒ
ph	bh	th	dh	kh	gh	ʧh	ʤh	fh	vh	sh	zh	θh	ðh	ʃh	ʒh	hh	mh	nh	ŋh	lh	rh	wh	jh
pm	bm	tm	dm	km	gm	ʧm	ʤm	fm	vm	sm	zm	θm	ðm	ʃm	ʒm	hm	mm	nm	ŋm	lm	rm	wm	jm
pn	bn	tn	dn	kn	gn	ʧn	ʤn	fn	vn	sn	zn	θn	ðn	ʃn	ʒn	hn	mn	nn	ŋn	ln	rn	wn	jn
pŋ	bŋ	tŋ	dŋ	kŋ	gŋ	ʧŋ	ʤŋ	fŋ	vŋ	sŋ	zŋ	θŋ	ðŋ	ʃŋ	ʒŋ	hŋ	mŋ	nŋ	ŋŋ	lŋ	rŋ	wŋ	jŋ
pl	bl	tl	dl	kl	gl	ʧl	ʤl	fl	vl	sl	zl	θl	ðl	ʃl	ʒl	hl	ml	nl	ŋl	ll	rl	wl	jl
pr	br	tr	dr	kr	gr	ʧr	ʤr	fr	vr	sr	zr	θr	ðr	ʃr	ʒr	hr	mr	nr	ŋr	lr	rr	wr	jr
pw	bw	tw	dw	kw	gw	ʧw	ʤw	fw	vw	sw	zw	θw	ðw	ʃw	ʒw	hw	mw	nw	ŋw	lw	rw	ww	jw
pj	bj	tj	dj	kj	gj	ʧj	ʤj	fj	vj	sj	zj	θj	ðj	ʃj	ʒj	hj	mj	nj	ŋj	lj	rj	wj	jj

Table 2: Possible combinations of two **Bosnian/Croatian/Serbian** consonants in an onset

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2.1. Differences between English and BCS

The reason for BCS having more possible combinations of two consonants in the onset than English cannot be due to the different number of consonants in these two languages. A more likely reason why this is so is that BCS seems to be more relaxed in combining consonants than English. Below I will outline the key points where these two languages diverge and where they are similar.

While in English it is impossible to combine *two plosives*, BCS allows four such combinations: /**pt**itsa/ - 'bird'; /**bd**io/ - 'stayed.masc up/kept.masc awake'; /**tk**ati/ - 'weave'; /**gd**je/ - 'where'.

In English, there is one combination of a *plosive* and a *fricative* (kvetch /**kv**etʃ/), while in BCS there are two such combinations: /**ptʃ**ela/ -'bee'; /**ks**enofobija/ - 'xenophobia'.

Plosive-nasal combinations seem to be nonexistent in English, while BCS has eight combinations of this sort illustrated by the following examples: /**pn**eumonija/ - 'pneumonia'; /**tm**uran/ - 'gloomy'; /**kɲ**iga/ - 'book'; /**dn**o/ -'bottom'; /**dɲ**epar/ - 'name of a mounain'; /**gm**izavats/ - 'reptile'; /**gn**usan/ -'loathsome; /**gɲ**ida/ -'nit'.

Combinations of plosives followed by approximants are productive in both languages. English has nineteen such pairs: /**pl**ʊərl/; /**bl**ɜːr/; /**kl**eptəmeIniə/; /**gl**oʊbl/; /**pr**als/; /**br**alt/; /**tr**al/; /**dr**eɪn/; /**kr**æk/; /**gr**ædʒʊeɪt/; /**tw**ɪst/; /**dw**ɔːrf/; /**kw**ɪz/; /**gw**aːnəʊ/; /**pj**uː/; /**bj**uːtəfl/; /**tj**uːn/; /**dj**uːk/; /**kj**uːt/; while BCS has twenty-three: /**pl**aːv/ - 'blue'; /**bl**ijeːd/ - 'pale'; /**tl**aːk/ - '(blood, air) pressure'; /**dl**an/ - 'palm (of a hand)'; /**kl**iːzati/ - 'slide'; /**gl**aːva/ - 'head'; /**pɾ**atʃka/ - 'robbery'; /**bɾ**edotʃa/ - 'paleness/pallor'; /**kɾ**uːtʃ/ - 'key'; /**gɾ**iva/ - 'mushroom'; /**pj**evati/ - 'sing'; /**bj**eʒati/ - 'run (away)'; /**tj**erati/ - 'chase'; /**dj**evoːjka/ - 'girl'; /**tv**oj/ - 'your'; /**dv**a/ - 'two'; /**kv**aka/ - 'handle/knob'; /**gv**oʒdʑe/ - 'iron'.

Additionally, BCS has six *plosive-trill* pairs: /**pr**aːvo/ - 'law/right'; /**br**at/ - 'brother'; /**tr**aːg/ - 'trace'; /**dr**ama/ - 'play'; /**kr**uːg/ - 'circle'; /**gr**oːʒdʑe/ - 'grapes'.

Both languages allow /s/ to precede *plosives* (English: /**sp**ɪn/; /**st**ei/; /**sk**ɪp/), but in BCS plosives can also be preceded by /tʃ, ʃ, z, ʒ, h/. Voiced fricatives precede voiced plosives and voiceless fricatives precede the voiceless ones: /**tʃk**aɾa/ - name/den/lair (*folk speech)*; /**sp**uʒva/ - 'sponge'; /**ʃp**anija/ - Spain; /**zb**osti/ - 'stab'; /**ʒb**uka/ - 'daub/

plaster'; /**st**ati/ - 'stop'; /**ʃt**a/ - 'what'; /**ht**io/ -'want.3rd.masc.past'; /**zd**eːnats/ - 'draw-well'; /**ʒd**erati/ - 'gobble'; /**sk**otʃiti/ - 'jump'; /**ʃk**ola/ - 'school'; /**zg**uʒvati/ - 'crumple'; /**ʒg**oʎav/ - 'runty'.

A combination of *two fricatives* is not very usual in English (/**sf**iər/; /**sv**ɛlt/), while BCS has five possible combinations of this kind: /**sts**ena/ - 'scene'; /**ʃtʃ**epati/ - 'grasp'; /**ʃtɕ**utɕuriti se/ - crouch; /**sf**era/ - 'sphere'; /**sh**odno/ - 'according to'.

Fricative-nasal pairs are also more productive in BCS: /**tsm**akati/ - 'smack'; /**tʃm**ula/ - 'earthenware jug for wine or water (*folk speech)*'; /**sm**ijeːx/ - 'laughter'; /**zm**ija/ - 'snake'; /**ʃm**iːnka/ - 'make-up'; /**ʒm**iːriti/ - 'have one's eyes closed'; /**hm**eʎ/ - 'hop' (plant); /**sn**ijeːg/ - 'snow'; /**zn**aːɲe/ - 'knowledge'; /**ʃn**aːla/ - 'hair grip/pin'; /**sɲ**eguʎitsa/ - 'Snow White'. English pairs of this kind are: /**sm**aɪl/; /**sn**ɔːr/; ?/**(h)m**/.

Fricative-approximant pairs are productive in both languages (English: /**fl**oʊ/; /**sl**oʊ/; /**fr**ɔg/; /θroʊ/; /**ʃr**ɪŋk/); however, BCS has a lot more possible combinations of these consonants: /**tʃl**aːn/ - 'member/article'; /**fl**aʃa/ - 'bottle'; /**sl**aviti/ - 'celebrate'; /**zl**aːto/ - 'gold'; /**ʃl**aːg/ - 'cream' ; /**ʒl**ijeːb/ - 'groove'; /**hl**aːdan/ - 'cold'; /**sʎ**epotɕa/ - 'blindness'; /**ʃʎ**iva/ - 'plum'; /**ʒʎ**ezdani/ - 'glandular'; /**hʎ**eb/ -'bread'; /**tsj**evanitsa/ - 'shin'; /**fj**ord/ - 'fiord'; /**sj**aːjan/ - 'brilliant/shiny'; /**zj**aːpiti/ - 'gape'; /**tsv**ijet/ - 'flower'; /**tʃv**or/ - 'knot'; /**sv**ijet/ - 'world'; /**zv**ijezda/ - 'star'; /**ʃv**itsarska/ - 'Switzerland'; /**ʒv**akati/ - 'chew'; /**hv**aliti/ - 'praise'.

Fricative-trill pairs in BCS are: /**tsr**ijeːvo/ - 'intestine'; /**fr**aːza/ - 'phrase'; /**sr**esti/ - 'meet'; /**zr**aːk/ - 'air'; /**hr**aːbar/ - 'brave'.

None of the two languages has *nasal+plosive* or *nasal+fricative* combinations. English also does not have *nasal+nasal* combinations, while BCS has one such combination: /**mn**ogo/.

English has one *nasal+approximat* pair (/**mj**u/), while BCS has three (/**ml**aːd/ - 'young'; /**mʎ**ekara/ - 'dairy'; /**mj**eseːts/ - 'moon/month'), and a *nasal+trill* pair (/**mr**aːv/ - 'ant'). It is interesting to note that only the bilabial nasal combines with approximants, possibly because its place of articulation is not too close to the place of articulation of approximants that it combines with.

Approximants are the least expected consonants to be placed initially in a two-consonant onset, and as both English and BCS show, there are no onsets that have an approximant followed by a plosive, fricative or nasal. However, BCS has one combination of a *trill* followed by an *approximant*: /**rj**etʃniːk/ - 'dictionary', two

combinations of *two approximants*: /**vl**a:da/ - 'government'; /**vj**era/ - 'faith/religion', and one *approximant-trill* pair: /**vr**a:ta/ - 'door'.

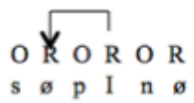
From the outline of the possible consonant pairs in the onset, it can be observed that English is more sensitive to the *minimal sonority distance* than BCS is. English consonants tend to combine with consonants that are at least two levels apart on the Sonority scale, while BCS is much more flexible when it comes to combining consonants even from immediately adjacent levels.

2.2. The reanalysis of "onsets"

The previous section shows that both in English and BCS, clusters at the beginning of the word can sometimes (and in BCS in many cases) violate the Sonority Principle, and have a more sonorous consonant in the left-most position preceding a less sonorous consonant or the one with the same degree of sonority. I will try to explain these combinations, assuming that there are no exceptions to the Sonority Principle, by appealing to Dependency/Government Phonology. Let us consider some examples of these apparent 'exceptions':

(3)

spin /spɪn/



The example in (3) illustrates the phenomenon in English that fricatives can precede plosives. Instead of considering this cluster one onset, we can analyze it as two onsets separated by an empty rhyme position. As it was mentioned in the introductory section, empty constituents must be licensed by some overt material. In (3) we have two such units, and both of them are licensed. The empty rhyme at the end of *spin* is licensed by 'final licensing', and the rhyme between /s/ and /p/ is licensed by the following rhyme that has content: /I/.

If we would want to keep the generalization made for English that the 'minimal sonority distance' between two consonants in an onset is two levels, then we could also reanalyze those seemingly exceptional cases (fricative-nasal and nasal-approximant) in the same fashion as these fricative-plosive clusters, and assume that the pairs of consonants that are at adjacent levels of sonority do not form one onset, but rather two onsets separated by an empty rhyme, as in the words: *smoke, snore, mew.*

In this way we could capture all the English onsets by these two rules: sonority in the onset must raise (the Sonority Principle), and the second consonant in a branching onset has to be two levels higher on the sonority scale than the first one (minimal sonority distance).

For BCS, on the other hand, it might not be a very good idea to assume that plosive-fricative, plosive-nasal, fricative-nasal and nasal-approximant pairs in fact represent two onsets split by a rhyme because these combinations are very productive in the language, therefore the reason for their existence may be something else. It can be argued that the difference between these two languages is in the *minimal sonority distance* that they impose on two consonants in the onset. BCS may be assumed to allow consonant pairs in which the second consonant is equally sonorous or one level more sonorous than the first one. Many words in this language begin with pairs of consonants of the same degree of sonority: plosive-plosive, fricative-fricative, and nasal-nasal. Even though there are twelve fricative-fricative pairs, it might still be reasonable to assume that all of these pairs represent two onsets split by an intervening rhyme because, independently of this, fricatives seem to be exceptional by themselves. They can precede not only fricatives, but also plosives and nasals, as well as pairs of consonants forming three-consonant clusters (***htj****eti*, ***spr****ava*, ***spl****av*, ***štr****udla*, ***zdr****avlje*, ***ždr****al,* ***smj****eti*). On the other hand, if we would still consider these pairs of equally sonorous consonants as one onset, then we would need to assume that BCS does not impose the *minimal sonority distance* at all.

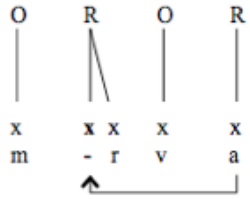
3. "Vowel shortage" in BCS – problematic cases

BCS is traditionally considered to have the syllabic /r/ consonant that can appear in the nucleus. As it was pointed out in van der Hulst (2011), dependency/government phonology does not place syllabic consonants into the nucleus position, but rather into the coda of an empty-headed rhyme. This syllabic consonant can appear both in stressed and unstressed syllables in BCS.

Let us assume this /r/ to be in the 'coda' and consider some examples from BCS.

(4)

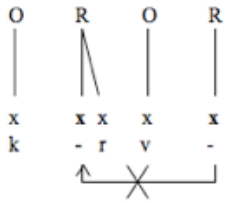
/mrva/ - ‘crumb’ /krtitsa/ - ‘mole’
/drvo/ - ‘tree’ /grditi/ - ‘tell off/scold’
/prvi/ - ‘first’ /srdatʃno/ - warmly/heartily’
/zrno/ - ‘grain’



The requirement that a branching rhyme be followed by a contentful rhyme is met here, as well as the requirement that an empty-headed rhyme (=empty nucleus) must be followed by a visible onset and a visible rhyme.

(5)

/krv/ - 'blood'
/grm/ - 'bush'
/grtʃ/ - 'cramp'

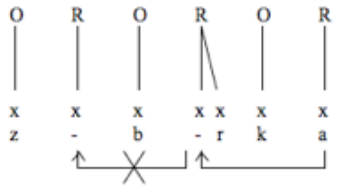


The first problem we encounter with words containing a ‘syllabic /r/’ is illustrated by the words in (5). These words end in a consonant, which means that they have a final empty rhyme (For arguments motivating empty Os and Rs, see van der Hulst 2011 and references therein). This rhyme is licensed by being at the end of the word (‘final licensing’). However, if we would assume that there is also an empty nucleus preceding the /r/, then we would also have to assume that in this language even finally-licensed empty rhymes have enough power to license another empty rhyme adjacent to them, which is a slight departure from the adopted framework.

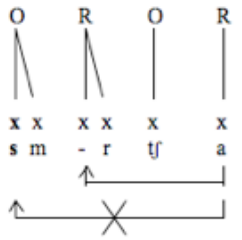
The previous proposition does not look so good, and the following examples seem to add more to the problem.

(6)

a. /zbrka/ - 'mess/muddle'
b. /zdrmati/ - 'hit' (*colloquial*)
c. /zgrnuti/ - 'pile/rake up'



d. /svrha/ - 'purpose'
e. /smrtʃa/ - 'spruce'

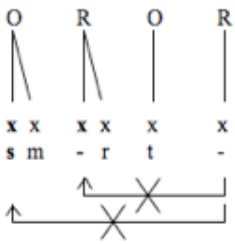


In section 2.2. fricative-fricative and fricative-plosive pairs were analyzed as two onsets split by an empty rhyme. This means that /z/ in (6 a-c) is followed by an empty rhyme that needs to be licensed. If we also keep the assumption followed so far that the 'syllabic /r/' is placed in the coda of an empty-headed rhyme, than we have an obvious problem. Looking from right to left, the first empty rhyme would be licensed by the contentful final rhyme in all of these words. However, if we would permit this empty rhyme to license another empty rhyme, than it would seem as if anything can license anything, with no restrictions. In (6d-e) we have another problem. Fricative-nasal and fricative-approximant pairs were assumed to form felicitous onsets in BCS, so there is no need to assume that there is an empty rhyme between the fricative and the approximant/nasal. Both of them can be placed under one O, forming a 'branching onset' (see the diagram illustrating (6e) on the previous page). But a branching onset has to be followed by a contentful rhyme that empowers the head of the onset to govern its dependant. So in this case the branching onset would not be licensed because /a/ is too far away, and the head of the rhyme immediately following /sm/ is empty and incapable of licensing. I will return to this problem after illustrating some further problems that arise in these 'vowelless syllables'.

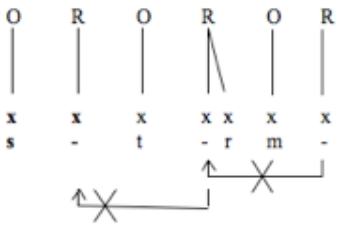
BCS has words parallel to the ones in (6), the only difference being that they do not even have a final vowel.

(7)

a. /zvrk/ - 'whirligig'
b. /ʃmrk/ - '(fire)-hose'
c. /smrt/ - 'death'



d. /strm/ - 'steep'



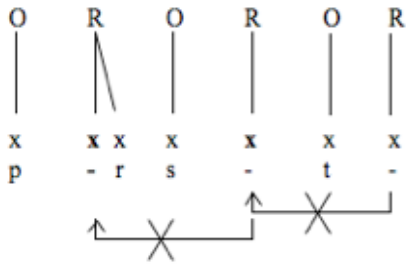
As in the previous set of words, /s/ in (7d) could be assumed to be followed by an empty rhyme. The fricative-approximant pair in (7a), and fricative-nasal combinations in (7b) and (7c) would represent branching onsets. Both of these deviations need licensing by an immediately following contentful rhyme. These words end in a consonant, so there has to be another empty rhyme at the end of every word in (7), which is finally licensed. In these cases, even if we allow for the final empty rhyme to license the empty

nucleus that precedes the 'syllabic /r/', we would have a situation just like in the previous cases in (6). If we do not allow for this possibility, then we have an even bigger problem with these examples, because neither the nucleus preceding the /r/, or the empty rhyme following /s/ in (7d), or even the branching onsets in (7a-c) would be licensed.

To add more complication to the whole story, the following examples can also be added.

(8)

a. /prst/ - 'finger'
b. /krst/ - 'cross'

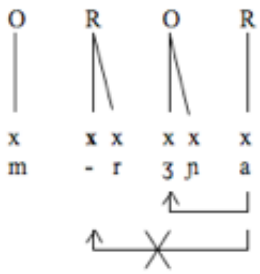


These two words end in /st/, which means that, by the assumptions made previously, they should end in an empty rhyme. Besides, /s/ and /t/ should be split by an empty rhyme because of their sonority profile. The phoneme /r/ is also supposed to be preceded by another empty nucleus. In this case even if we adopt the assumption that the final empty rhyme has licensing power, we would still have an unlicensed rhyme preceding the /r/.

And finally, let us consider the following word in BCS:

(9)

/mrʒɲa/ - 'hatred'



The problem here is that the branching onset /ʒɲ/ intervenes between the final /a/ and the empty nucleus of the preceding branching rhyme, preventing the latter to be licensed by /a/.

4. Discussion

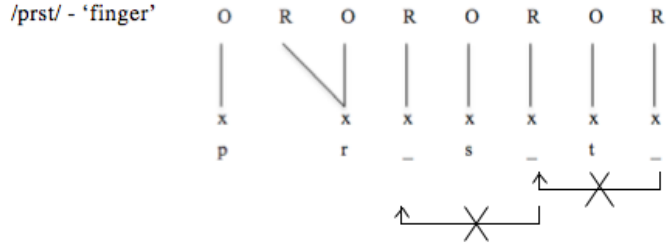
In the previous section, I have illustrated problematic cases of BCS words that seem to allow more freedom in licensing empty units in syllables. What this shows is that it is necessary to make some additional assumptions to deal with these cases, and one way of doing that might be to posit a different analysis of consonant pairs that begin with a less sonorous phoneme; an analysis that does not assume that these are split by an empty rhyme. However, even if we would do that, there would still remain a lot of problems. Even without these empty

rhymes, other cases were illustrated where empty rhymes could not be licensed because they were followed by empty rhymes (see (7-8)).

A second option might be to assume that the position preceding the /r/ is not actually empty, but filled by a schwa-like[3] vowel. In this case, the position preceding /r/ would not even need licensing, which would take care of the problematic cases in (5) and (9). In (5) we would not need to assume that the final empty rhyme licenses the empty nucleus preceding /r/, in (9) as well this position would not need to be licensed and the branching onset preceding /a/ would not represent a problem any more. If we also assume then that this position can license the rhyme preceding it, then cases in (6) and (7) would also be covered. However, to deal with cases in (8) we would still need to assume that the final empty rhyme is capable of licensing the empty rhyme preceding it.

Another possible view could be to assume that the 'syllabic /r/' is actually placed in the onset and that is 'spreads' to the preceding rhyme (For a description of consonant 'spreading', see Scheer 2003; van der Hulst 2008). If we assume that this rhyme does not need to be governed for the /r/ to spread to it, and that this position has the capacity to license an empty rhyme that precedes it as though it was filled by a vowel, then this option covers the same cases as the previous one: in (5), it would not be necessary for the final rhyme to govern an empty position any more; in (6) the empty rhyme between the fricative and the plosive/fricative at the beginning of the word would be licensed; in (7), we would still need to assume that the final empty rhyme is capable of licensing an empty rhyme preceding it, but this empty rhyme would not be preceded by another empty rhyme; (8) and (9) would still remain problematic. In (8a), repeated here as (10), we would still need to assume that there are three empty rhymes: final, and two rhymes preceding it. This would again mean that there is an unlicensed rhyme, even if we assume that the final rhyme is capable of licensing the rhyme before /t/.

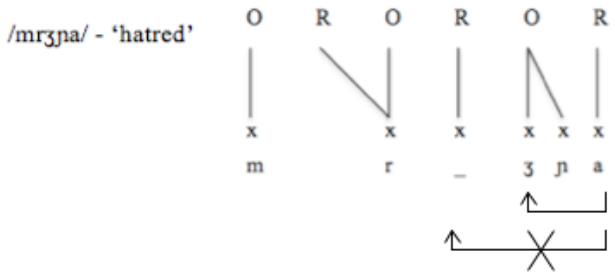
(10)



[3] I am not suggesting *schwa* because 'syllables' where this /r/ appears are usually stressed.

In (9), repeated here as (11), there is another problem. If we assume that /r/ is in an onset, spreading to the preceding rhyme, it would still need to be followed by an empty rhyme that separates it from the following onset. This onset is /ʒɲ/, and this pair represents a felicitous onset in BCS, so we can assume that both consonants are placed in a branching onset. A branching onset has to be followed by a contentful rhyme, in order for the head of the onset to license its dependant. This disables the rhyme following a branching onset to license anything else, so the empty rhyme that precedes this branching onset in (9/11) is not licensed (this case was not problematic under the 'schwa-like vowel' assumption).

(11)



As we can see from the different analyses of the examples, all the three proposals are problematic for the syllabic /r/ cases in BCS. It has been demonstrated that if we avoid putting the syllabic consonant into the nucleus position in a rhyme, following assumptions under the Dependency/Government phonology framework, we encounter a lot of problems. Let us now see what happens if we do place /r/ into the nucleus. Examples in (4) turn out to be without any empty position that needs licensing. Those in (5) would only have a final empty rhyme that would be licensed by the mere fact that it is final. Words in (6) that were problematic for the approach that placed /r/ in the coda of an empty headed rhyme would not be problematic any more because /r/, being the head of the rhyme now, would be able to license the preceding empty rhyme between the fricative and the plosive in (6 a-d), as well as the branching onset in (6e). The same would hold for (7) and, on top of that, it would not be necessary to assume that the final rhyme licenses the empty rhyme preceding it. The example in (9) would also be unproblematic now because there would not be an empty rhyme in front of the branching onset that needs licensing. However, examples in (8) would still remain problematic. If we keep the analysis that a pair 'fricative+plosive' cannot be an onset due to the Sonority Principle violation, we would need to assume that there is an empty rhyme between them. But, the words in

(8) have this pair of consonants at the very end of the word, so we also need to assume that there is an empty rhyme placed in the final position after them. Thus, again we have a situation where we need to assume that the final empty rhyme can license an empty rhyme preceding it.

Having looked at these words in BCS that appear to lack vowels from four different angles, the last one seems to be the least problematic. Placing the syllabic /r/ into the nucleus covers the same range of cases as the proposal to have a 'schwa-like' vowel in the nucleus preceding the /r/ in the coda. But the latter analysis had an additional complication in that these syllables with the syllabic /r/ can bear stress, so a schwa should not appear in them. Therefore, it seems that the syllabic /r/ in BCS can be the head of the rhyme, and license empty and branching units preceding it.

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