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From early Slavic to modern Bulgarian: a survey of changes in the vowel system and the syllable structure

1. Main periods in the development of the early Slavic vowel system.
The periodization adopted here is that suggested by Andersen (1985).

Andersen (1985) defines "from the point of view of the vocalism, four typologically distinct, consecutive periods" in early Slavic. Let us look at them.

1.1. Early Slavic 1.

According to Andersen (1985:72) this period has to be given "as its initial terminus the cumulation of changes by which Slavic emerged as a distinct variety of speech from the neighboring Indo-European dialects".

The following sound changes affected the vocalic system of reconstructed Proto-Indo-European[1] (fig.1)
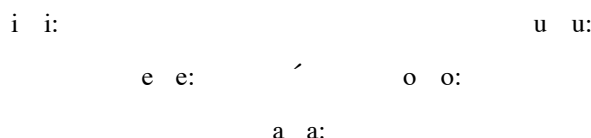
i   i: u   u:

    e   e: ´   o   o:

            a   a:

Fig.1 The vowel system of Proto-Indo-European

in the Slavic area:
— merger[2] of *o, *a and schwa (*´);
— merger of *o: and *a: ;

These were mergers by approximation (cf. Labov 1994:321): the gradual approximation of the phonetic targets of two phonemes until they become nondistinst. These mergers most probably resulted from the coalescence of *o(:) and *a(:), preceded by that of *a and *´ (the latter was shared by many other Indo-European dialects). The resulting vowels show a mean value intermediate between those of the original two. We transcribe them as back low unrounded vowels (A), but given that the rounding became irrelevant for them, they may have had rounded realizations as well ([Å] according to IPA).

— lowering of *e and *e:, which both became low front vowels, *œ and *œ: respectively (cf. Carlton 1991:97-98).

This lowering can be interpreted as a manifestation of the phonological drive for symmetry.

Thus, towards the end of this period the number of qualitatively distinct vowels was reduced from five to four. Hence, a two-level vowel system developed in Early Slavic 1 (fig.2).
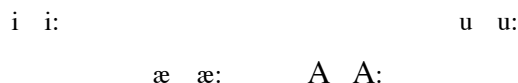
i   i: u   u:

        æ   æ: A   A:

Fig.2 The vowel system of Early Slavic 1

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1   In our representations of the Proto-Indo-European and Early Slavic vowel phonemes we use only the symbols of the International Phonetic Alphabet (IPA). The symbol for length in the IPA is [:]. Hence our representation 'i:' is equivalent to the traditional 'ī', etc.

2   According to Labov (1994:119) a merger is a change in the relations of two vowels in which one assumes or approximates the position held by the other.

As pointed out by Carlton (1991:98), the development of this new vowel system "is now an undisputed fact in Slavic studies", but its existence was not established until relatively recently – long after a unified notational system for Proto-Slavic reconstructions had been accepted by all Slavicists.

Given that in an autosegmental perspective, quantitative oppositions between vowels are attributed to the different number of skeletal positions (one for short and two for long vowels) associated with a given vocalic quality, two distinctive features suffice to describe the vowel system of Early Slavic 1 (fig.3).

	[±back]	[±low]
i(:)	–	–
u(:)	+	–
æ(:)	–	+
A(:)	+	+

Fig.3 Early Slavic 1: distinctive features for vowels

During this period decreasing sonority in the syllable rhyme was still tolerated.

The distinction between front and back vowels becomes fundamental. During Early Slavic 1 there develops a tendency to synharmonism. It becomes impossible for a palatal[3] consonant to be followed by a back vowel. Back vowels after palatals shift to the front:

u > i, u: > i:, A > æ, A: > æ:

Examples: *sju:tei̯ > šu:ti > šiti 'to sew' ; *poljo > pAlʲA > pAlʲæ 'field'.

Two types of syllables, traditionally called soft (with front or 'soft' vowels) and hard (with back or 'hard' vowels), are thus distinguished, each with its own set of admissible consonants.

1.2. Early Slavic 2.

This period saw the so called 'First Common Slavic Vowel Shift' take place. It is a typical case of minimal chain shift: a change in the position of two phonemes in which one moves away from an original position afterwards occupied by the other (Labov 1994:118). The entering element of this vowel chain is the diphthong /Au8/ which monophthongizes (see 2.1) and the leaving element is the long /u:/ which moves to the front. The linear representation of this minimal chain shift looks like this:

/Au8/ —> /u:/ —>

The movement of the entering element is /Au8 —> u:/, that of the leaving element[4] is /u: —> I:/.

The first vowel shift added an unrounded back (or maybe central) vowel to the vowel system of early Slavic (see fig.4).
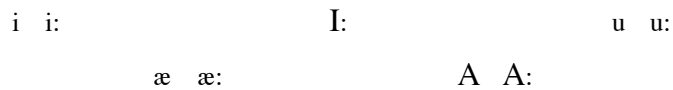
i i: I: u u:

æ æ: A A:

Fig.4 The vowel system of Early Slavic 2

Thus the feature [± round] was reintroduced into the vowel system in order to distinguish /u:/ from /I:/.

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3   The palatals include consonants resulting from jotation or the first palatalization.
4   The terms 'entering' and 'leaving' are neutral with respect to which is the initiating and which is the responding element in a temporal or causative sense, or whether the two elements move together.

	[±back]	[±low]	[±round]
i(:)	–	–	–
u(:)	+	–	+
I:	+	–	–
æ(:)	–	+	–
A(:)	+	+	

Fig.5 Early Slavic 2: distinctive features for vowels

Rounding is irrelevant for /A/ and /A:/. That is why in fig.3 these vowels have been left unspecified for the feature [±round]. It is probable that during Early Slavic 2 there was a considerable margin of variation between rounded and unrounded realizations of both the short and the long vowel A.

All syllables with decreasing sonority within the rhyme had to be restructured during Early Slavic 2 (cf. §2).

1.3. Early Slavic 3

This period is characterized by the changes traditionally designated as 'Second Common Slavic Vowel Shift', a shift from quantitative to qualitative contrasts in the vowel system. The formerly short vowels distinguished themselves from their long counterparts by becoming less tense and articulated more in the mid range of vowels. Thus, /i/ and /u/ became lower, but /æ/ and /A/, higher. On the other hand, the long vowels retained their position at the extremes of the vowel triangle: /i:/, /I:/ and /u:/ remained high vowels, and /A:/ remained a low one. Even in the case of /æ:/ there are many reasons for reconstructing a low front vowel as the result of this shift (at least for a large part of the Slavic area): e.g. the fact that the glagolitic alphabet uses the same letter for /æ/ and for /A/ with palatalization of the preceding consonant, i.e. graphically Cæ = CⱼA; the Modern Bulgarian and Polish developments of this vowel.
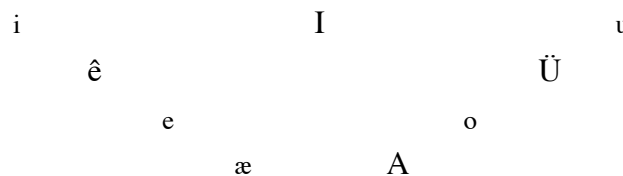
i　　　　　　I　　　　　u
　　ê　　　　　　　　　Ü
　　　e　　　　　　o
　　　æ　　　A

Fig.6 The vowel system of Early Slavic 3

	[±back]	[±low]	[±tense]	[±round]
i	–	–	+	–
ê	–	–	–	–
u	+	–	+	+
Ü	+	–	–	+
I	+	–	+	–
æ	–	+	+	–
e	–	+	–	–
A	+	+	+	
o	+	+	–	

Fig.7 Early Slavic 3: distinctive features for vowels

This system came into existence rather late, in the period of dialectal disintegration. It is the system used as the starting-point in the historical phonology of any of the individual Slavic languages.

The high lax vowels, traditionally called *jers,* demonstrated a tendency to reduction in some specific contexts, such as the so-called *weak position* (word-finally and before a syllable with a 'full' vowel, i.e. a vowel that is not a jer). They were later involved in the jer shift (see §1.4.).

1.4. Early Slavic 4

This period followed the 'Third Common Slavic Vowel Shift', the so-called jer shift. Jers in *strong position* (before a syllable with another jer) cease to be interpretable as the lax counterparts of tense high vowels. The different mergers of the strong jers in different areas, along with the divergent treatments of the prosodic features, imply that "from the point of view of the vocalism – the typological unity of the Slavic dialects came to an end with the jer shift" (Andersen 1985:75). During this period we observe a gradual relaxation of the constraints on syllabification. The 'law of the open syllables' is no longer at work. Hitherto inadmissible consonant clusters emerge at affix and clitic boundaries.

2. Evolution of branching rhymes in Early Slavic

The changes described in §§2.1–2.3 occurred only when the sequences VG (vowel + glide), VN (vowel + nasal consonant) or VL (vowel + liquid) occupied the syllable rhyme, i.e. when they preceded a consonant which was the onset of the following syllable (see fig.8). Before a vowel, the same sequences were not subject to restructuring, because the G, N, L respectively syllabified with the following vowel and thus occupied an onset and not a coda position (see fig.9). Therefore they were not in contradiction with the 'law of the open syllables'.
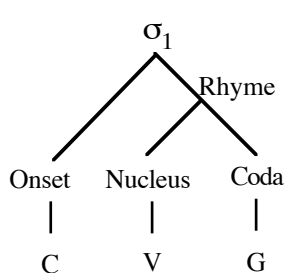

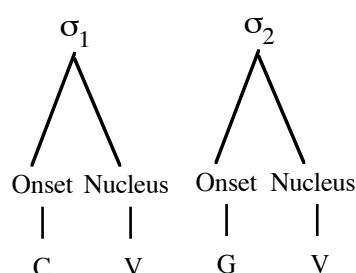Fig.8 VG in the syllable rhyme   Fig.9 G in the syllable onset

According to the general tendency to develop open syllables, sequences of two obstruents were eliminated by deletion of the first, which occupied a coda position.

2.1. Changes with *VG rhymes

Through successive mergers, Early Slavic 1 had reduced the twelve reconstructed PIE diphthongs (au̯, a:u̯, ou̯, o:u̯, ai̯, a:i̯, oi̯, o:i̯, eu̯, e:u̯, ei̯, e:i̯) to only four (fig.10). These all represented a combination of a low vowel followed by a high vowel (glide i̯ or u̯): Ai̯, Au̯, œi̯, œu̯[8].

PIE	au̯	a:u̯	ou̯	o:u̯	ai̯	a:i̯	oi̯	o:i̯	eu̯	e:u̯	ei̯	e:i̯
Early Slavic 1a	au̯		ou̯		ai̯		oi̯		eu̯		ei̯	
Early Slavic 1b	Au̯				Ai̯				æu̯		æi̯	
Early Slavic 2	u:				æ: (i:)[5]				ju:		i:	

Fig.10 VG rhymes: From PIE to Early Slavic 2

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5   This second outcome was restricted to certain specific morphological categories.

During Early Slavic 2, these diphthongs monophthongized when the glide occupied a coda position: Ai8 gave æ: (or *i:*), œi88 became *i:,* Au8 resulted in a long *u:* that was kept distinct from the PIE *u:,* which had already shifted to I: (see §1.2), and was finally transformed into an ingliding diphthong *ju,* an acceptable rhyme, where the sequence of segments demonstrates increasing sonority.

2.2. Changes with *VN rhymes

Similarly, if a VN sequence occurred in the syllable rhyme, the nasal consonant was eliminated from the coda position. In the case of *VN rhymes, the following process took place: after assimilating the preceding vowel, the N was lost (see fig.11). Thus, Vn and Vm sequences merged, giving rise to two nasal vowel phonemes: a back one (o$) and a front one (e$).

PIE	an	on	am	om	n¡	m¡	en	em	n¡	m¡
Early Slavic 1	An		Am		un	um	æn	æm	in	im
Early Slavic 2	o$					e$				

Fig.11 VN rhymes: From PIE to Early Slavic 2

2.3. Evolution of *VL rhymes
2.3.1. V = non-high vowel (see fig.12)

It is likely that in Early Slavic 2 sequences AL and æL developed a new vowel nucleus, identical with the vowel preceding L. Thus L was resyllabified as the onset of a newly-created syllable.

During Early Slavic 3 and 4 the sequences ALA and æLæ underwent different changes in the various Slavic dialects. In South and West Slavic the original low V was dropped. In South Slavic and the Czecho-Slovak region, but not in Lekhitic, the remaining vowel was subjected to a lengthening.

Proto-Indo-European		aL	oL	eL
Early Slavic 1		AL		æL
Early Slavic 2		ALA		æLæ
Early Slavic 3	South Slavic, Czech Lekhitic East Slavic	LA: LA ALA		Læ: Læ æLæ
Early Slavic 4	South Slavic, Czech Lekhitic East Slavic	LA Lo oLo		Læ Le eLe

Fig.12 VL rhymes with a non-high V: From PIE to Early Slavic 4

2.3.2. V = high vowel (see fig.13)

In Early Slavic 1 the syllabic liquids of Proto-Indo-European developed leftward anaptyctic vowels (short *i* or *u),* thus becoming codas in rhymes with decreasing sonority: *r¡ > ir, ur ; *l¡ > il, ul. The new distinction between iL and uL developed in conformity with the 'law of syllable synharmonism'. Being in contradiction with the tendency only to admit rhymes with increasing sonority, the sequences of 'high vowel + liquid' were most probably restructured once more in Early Slavic 2, giving rise to new syllabic liquids. Following the tendency towards syllable synharmonism, some of the syllabic liquids were 'hard' and others 'soft', i.e. palatalized syllabic liquids. A syllable of the type CL¡ , CL¡^{j}, where the liquid constitutes the syllable nucleus, does not violate the constraint on open syllabification.

Proto-Indo-European	r¡ , l¡	
Early Slavic 1	ur, ul	ir, il
Early Slavic 2 & 3	r¡ , l¡	r¡ ʲ, l¡ ʲ
Early Slavic 4: Russian, Polish Czech, Slovak, Serbo-Cr Bulgarian	Vr, Vl r¡ , l¡ Pr, rP, Pl, lP	

Fig.13 VL rhymes with a high V: From PIE to Early Slavic 4

2.4. Evolution of sequences CLuC, CLiC (see fig.14)

The changes in these sequences belong to the period after the loss of the jers, that is to Early Slavic 4 and to the histories of the individual Slavic languages.

The sequences CLuC, CLiC were perfectly in accord with the syllable structure of Early Slavic 2 and, therefore, not subject to any restructuring.

Their reflexes in the individual Slavic languages are dependent upon whether the jer vowel is in strong or weak position (see §§1.3-1.4).

	The jer is in strong position		The jer is in weak position	
Early Slavic 1 & 2	Lu	Li	Lu	Li
Early Slavic 3	LÜ	Lê	LÜ	Lê
Russian	Lo	Le	Lo	Le
Polish, Czech	Le		L¡	
Serbo-Cr., Slovak	L¡			
Bulgarian	PL, LP			

Fig.14 'liquid + jer' between consonants : from Early Slavic 1 to 4

3. Some specific changes in Bulgarian

3.1. Evolution of the hard jer in strong position

During the Third Common Slavic Vowel Shift strong and weak jers developed very differently. Weak jers were lost whereas strong jers were retained as fully-fledged vowels and subjected to a lowering, a process traditionally known as the 'vocalization of jers'. The vowel that emerged from a strong jer differed widely from area to area. Both the back and front jer exhibited a great variety of reflexes. The nature of the vowel or vowels which developed from the strong jers is one of the points where Slavic languages most diverge.

In Bulgarian the two jers gave separate reflexes. The front jer remains a front vowel and after the lowering merged with the mid vowel of the front series: ê > e. The reflex of the back jer in strong position is specific: it did not produce the expected *o,* but an unrounded mid back vowel: Ü > P.

3.2. Evolution of the back nasal vowel

The result of the denasalization of the back nasal vowel was the same unrounded back vowel: o$ > P.

3.3. Merger of CLuC, CLiC; CuLC, CiLC and CLo$C.

We saw that the reflexes of the CLuC, CLiC (both in strong and weak position, see 2.4) and the CuLC, CiLC (VL rhymes with a high vowel, see 2.3) sequences in Modern Bulgarian, as in the other South Slavic languages and in Slovak, are identical. But, unlike the other languages, Bulgarian developed two different reflexes which do not correspond to the different historical contexts. In each of these contexts we find both PL and LP, that is, the liquid can be either preceded or followed by the back unrounded vowel.

The same reflexes are found in a word where the back nasal vowel was preceded by a CL cluster and followed by another consonant : gro$dÜ > grPd, 'bosom', gro$da > gPrda, 'breast'.

3.4. Synchronic alternations PL ~ LP.

In Bulgarian we find a set of morphemes, historically related to the merged contexts described in 3.3, which exhibit morphophonemic alternation with 'metathesis' of P and *r* or *l*. Here are some examples:

grPk 'Greek' (sg., indefinite) ~ gPrkPt (sg., definite), gPrci (pl.)

vrPv 'twine' (sg., indefinite), vrPvta (sg., definite) ~ vPrvi (pl.)

mPlcha 'be silent' (present, imperfective) ~ mlPkna (present, perfective), mlPk 'shut up!'

Since 1899 Bulgarian orthography has been in such cases based on the following principle (reflecting the actual pronunciation of the North-Eastern dialects):

rP , lP are written:

— before 2 (or more) consonants;

— in monosyllables.

In all other cases, i.e. before one consonant in polysyllables, Pr, Pl are written.

The older spellings of all these forms were: rÜ , lÜ , rê , lê [6], where the choice of Ü or ê was based on etymology.

4. A possible explanation of the Bulgarian reflexes in the merged contexts

I believe that in Middle Bulgarian, as in the other South Slavic languages, the reflex of the sequence 'high vowel + liquid' in the contexts CuLC, CiLC was a syllabic liquid: $r_¡$ ($< r_¡$, $r_¡{}^j$), $l_¡$ ($< l_¡$, $l_¡{}^j$). In the older spelling, to these syllabic liquids correspond the digraphs rÜ , lÜ , rê , lê [6].

The two other contexts (CLuC, CLiC and CLo$C) merged with CuLC, CiLC, because they were also reduced to syllabic liquids, the vowels Ü, ê, P being lost:

CLuC > CLÜC > (CLPC) > $CL_¡C$

CLiC > CLêC > $CL_¡{}^jC$ > $CL_¡C$

CLo$C > CLPC > $CL_¡C$

This merger took place in a period when speakers of Bulgarian tended to overcorrect the acoustic signal (cf. Jetchev 1993), deleting the vowels Ü, ê, P in the neighborhood of liquids.

In a later period, a new tendency towards undercorrection of the acoustic signal (cf. Jetchev 1993) arose. The Bulgarians then started inserting anaptyctic P next to syllabic liquids. These insertions could be leftward or rightward and the direction of the insertion depended upon the syllable structure. Apparently a constraint prohibiting LC codas was at work at that time. That is why Pr, Pl are admitted before one consonant when a vowel follows (i.e. in polysyllables), but not in monosyllables where the following consonant is word-final and hence it cannot be resyllabified as the onset of another syllable.

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[6]In the Cyrillic alphabet: pъ, лъ, pь, ль.