Syllable Rimes in Old Indo-Aryan and Dravidian

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This paper attempts first to describe the restrictions on syllable structure which are present in Old Indo-Aryan but not elsewhere in Indo-European languages, and then to compare them with their equivalents in early Dravidian phonology. Sound rules such as SEVERS’S LAW and OSTHOFF’S LAW suggest that it is a common tendency of Indo-European languages to avoid syllable rimes of more than two moras, a tendency still confirmed in the early layer of Old Indo-Aryan by a computational analysis of Rgvedic meter. On the other hand, Sanskrit grammarians describe curious gemination rules of clustered consonants, which show that consonants of the same stricture are preferred in the clusters of later Old Indo-Aryan. This preference for the agreement of stricture across a syllable boundary seems to have superseded the original tendency to avoid overlong rimes in the course of the development within Old Indo-Aryan. In the reconstructed phonology of the Dravidian languages, place and closure of obstruents always agree across a syllable boundary. Old Indo-Aryan is in a transition regarding the well-formedness of syllable rimes, and the innovated syllable structure exhibits a similarity to that of early Dravidian.

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Abbreviation

V: vowel; Y: glide; C: consonant or glide; L: liquid; N: nasal; R: sonorant (Y+L+N); S: sibilant; T: stop; K: non-continuant (N+T); X: vowel or

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consonant; ā, ē, āː: long vowel; V, ūː: short vowel; ɐ, ˒, ñː: /ɛ/, /ɪ/, /m/ and /n/ in syllable nucleus; *ː: reconstructed as; *ː: unattested; *ː: syllable.


0. Background

Since Sandfeld’s *Linguistique balkanique* (1930), linguists have noted that neighboring but genetically unrelated or remotely related languages often share a number of structural properties after a long period of contact. This phenomenon, called ‘convergence area’, is best known in the Balkan languages, which belong to different subfamilies of Indo-European but came to share features such as postposition of an enclitic definite article and use of the coordinate clause instead of an infinitive phrase.

For the languages of the Indian subcontinent as well, similarities regarding retroflex phonemes (Kuiper 1967), gerund (Masica 1978), echo-word construction and quotative particles (Emeneau 1956) have been pointed out. On the other hand, less phenomena have been proposed to be areal in the patterns of phonological alternation. Chatterji (1926, p.171) suggests the possibility that cluster assimilation in Middle Indo-Aryan and Dravidian might be due to convergence. Krishnamurti (1991) points out parallelism between the developments of Old Indo-Aryan sequence -VCCV- into non-Northwest Middle Indo-Aryan -VCV- and -VCCV- on one hand, and of PDr. -VCCV- into -VCV- and of PDr. -VNT-, -VNTT-, -VNTT- into -VT-, -VTT-, -VTT- on the other, and suggests that a close contact between the two groups caused the parallel development of the overlong (i.e. longer than the durational equivalent of two moras) syllables into two moras.

In this paper, I will first discuss Indo-European restrictions on syllable structure, and Old Indo-Aryan preferences based on the meter of the Rgveda, the oldest Vedic text, and the description of syllable-boundary rules by native grammarians. After defining Indo-Aryan innovations through comparison of the well-formedness of syllable and syllable boundary in Indo-European languages, I will compare those innovations with early Dravidian, thereby attempting to contribute to the discussion of Indian convergence area.

1.1 Well-formedness of syllable rimes in Indo-European

Since linguistic reconstruction is based on “identities or systematic correspondences of phonemes” (Bloomfield 1933, p.302), a reconstructed string may not automatically yield itself to syllabic division and analysis of well-formedness. The shapes of Proto-Indo-European roots and suffixes themselves, however, entail the existence of overlong
syllables; when a root of the form *e/oRC or *e/C is followed by a suffix beginning with a consonant or a consonant cluster, the root syllable necessarily becomes overlong, provided that the notion of an overlong syllable is valid in Proto-Indo-European. E.g.: PIE *uoid-th2e ‘you know’ > Greek østh2a, Ved. vēṭha; PIE *h2euγH-to ‘utters’ > OAv. aogadā, Greek eikto; PIE *gnh3-sko-h2 ‘I come to know’ > Greek (g)ignóskō, Latin (g)nósco; PIE *mēns-e/o-s ‘month’ > Greek mēnós, Latin mēnis. Overlong syllables also arise secondarily from vowel contraction such as PIE *e-h2t-to root-aor.3sg.mid. > Homeric Greek ὀρτό ‘arose’, Ved. āṛta ‘set in motion’.

Although Proto-Indo-European seems to presuppose the existence of overlong syllable rimes, there are at least two sound rules which are shared by more than two subfamilies and which are sensitive to syllable weight:

i) Sievers’s Law (Seebold 1972): PIE *j, *u > Ved. iy, uv / VXC...V,1) This rule is not limited to Vedic, but the same adjustment is found in other subfamilies as well:


Anatolian: Hittite ardumēni ‘we cut with a saw’<*/arduwV-/<*/ardwV-/ (Melchert 1984, p.24ff).


Italic: The split of the verbal formation in *-je/o- into classes III and IV in Latin, such as III capiō, capere<*/kapio/e/o-<PIE *kh2p-ie/o- > Gothic haffis 2sg. : IV sentiō, sentire<*/senti/e/o-<PIE *spt-je/o-, audīō, audīre (Meiser 1998, pp.90, 194). This explanation, however, is rejected by Sommer (1948, p.505f), who attributes the shortening of *-i-< */je- to the Latin rule of Iambic Shortening (V>V / VC...V, V...V).

Cf. Celtic: *i is lost in Middle Welsh eil ‘other’<PIE *h2elio- > Latin alius, Greek ðllos, Gothic alja- while *i is preserved after *i in Welsh newydd ‘new’<PIE *nuui-o- >Ved. nā dioya- (Lewis and Pedersen 1961, p.15f., McConie 1996, p.109), showing that there was at least an adjustment in the nucleus status of *i in Celtic.

Although the anaptyxis itself is a repeatable sound change and there is no conclusive evidence for reconstructing this rule within Proto-Indo-European, these traces suggest that this law started in a very early period, if not Proto-Indo-European.

1) Sievers (1878, p.129), translated by Collinge (1985, p.159): “If, in Indic, /U/ or /U/ occurs before a vowel and itself carries no accent (not even the falling contraction of a post-acute syllable or of acute plus contraction), then — no matter what the accent position may be elsewhere in the word — this segment is realized as a consonant after a light syllable and as a vowel after a heavy syllable.”
itself. This rule implies that syllable rimes of both the shapes \( \tilde{V} \) and VC have the same prosodical effect of making the syllable heavy.

ii) Osthoff’s Law: PIE \(*\tilde{V} > \tilde{V} / \_RC\)

Italic: PIE \(*h_{2}\tilde{u}eh_{1}\pi to-\) ‘wind’ > *\(\tilde{u}\)\(\tilde{e}\)\(n\)to- > Latin \(\tilde{v}e\)\(n\)tu-\(s\) .
Celtic: PIE \(*h_{2}\tilde{u}eh_{1}\pi to-\) > Proto-Celtic \(*\tilde{w}\)\(\tilde{e}\)nt- > *\(\tilde{w}\)\(\tilde{i}\)nt\(\tilde{a}\) > Old Irish \(f\)\(e\)t ‘whistle’ (McConne 1996, p.55).
Germanic: PIE \(*h_{2}\tilde{u}eh_{1}\pi to-\) > Gothic \(w\)\(i\)nds.
Cf. \(*h_{2}\tilde{u}eh_{1}\pi to-\) > Vedic \(s\)\(a\)\(\tilde{\alpha}\)\(\tilde{\alpha}\)a- /\(v\)\(a\)\(\tilde{\alpha}\)\(\tilde{\alpha}\)a-. Hittite \(h\)\(u\)\(w\)\(a\)\(n\)ant- might come from a different vowel grade \(*h_{2}\tilde{u}b\)\(1\)\(e\)nt- as well as from \(*h_{2}\tilde{u}eh_{1}\pi t-\) (Melchert 1994, p.54).

The context of this law can be restated as \(_R\)\(a\), if the preservation of the vowel length before a final sonorant as in Greek \(p\)\(a\)\(t\)\(\tilde{e}\)r can be explained by word-final extrametricality (Don Ringe p.c.). In that case, both Sievers’s and Osthoff’s Laws have a common effect of eliminating overlong syllables, respectively by epenthesis and vowel shortening. It suggests that overlong syllables start being avoided already in the post-Proto-Indo-European period.

Hoenigswald (1988, p.202, 1989, p.559) considers that Greek and Vedic have independently developed processes which effect elimination of overlong syllable rimes together, adducing the following arguments: (i) In Epic Greek, PIE \(*-\tau\) appears as \(V\)\(r\) or \(rV\) depending on the weight of the preceding syllable rime. (ii) In the \(R\)\(g\)veda, full-grade non-thematic forms of \(*\)TeRT roots such as \(d\)\(\tilde{u}\)\(g\)\(d\)\(h\)i are avoided. (iii) Connective \(i\) of non-laryngeal origin is inserted between a perfect stem ending in a heavy syllable and an ending beginning with a consonant (\(w\)\(v\)\(i\)\(c\)-\(i\)-\(t\)\(h\)a : \(v\)\(i\)\(v\)\(y\)\(\tilde{\alpha}\)\(\tilde{\alpha}\)k-\(t\)ha). (iv) Hiatus instead of crasis before a consonant cluster as in \(s\)\(d\) \(i\)\(t\) \(C\) : \(s\)\(e\)\(d\) \(V\) (Wackernagel 1896, p.315). See Klein (1996) for the distribution of \(\tilde{a}\)\(\tilde{\alpha}\)\(\tilde{h}\)\(a\) and \(\tilde{a}\)\(\tilde{d}\)\(h\)a in the \(R\)\(g\)veda. (v) Sievers’s Law.

1.2 Quantitative evaluation of Hoenigswald’s observation

Although Hoenigswald convincingly demonstrates the tendency to avoid overlong syllables in the cadences of the second book of the \(R\)\(g\)veda, this book accounts for only about 4.7% of the whole \(R\)\(g\)veda, and it might not necessarily represent a common tendency of the text. And since the second book is a collection of the hymns by the poets of the \(G\)\(r\)tsamada family, this tendency might just be an idiosyncrasy or a dialectal feature. Scansion of the entire \(R\)\(g\)veda, however, can only be done by restoring the vowels which are considered to be contracted by synaeresis, synizesis and crasis before the authority of the text was established, and the metrical restoration requires scrutiny from the viewpoints of prosody, textual criticism and historical linguistics.

In order to see an approximate pattern of distribution of overlong syllables, I

2) See Ringe (1996, p.13) for the grade of the first vowel.
scanned the electronic texts of the Rgveda by the following procedures. I used two electronic texts of the Rgveda for this study; Holland and Van Nooten’s version contains Samhitā text based on Aufrecht’s edition, and Cardona’s (typed by Elliot Stern) contains Samhitā and Pada texts based on the edition of Vaidika Sanśodhana Manḍala. Since both of them treat two padyas as one line, pada boundaries need first be marked before examining the cadences. Padyas were split by a Perl script with the following algorithm:

1. Define the syllable as a string of any characters which includes a vowel or an avagraha. 
2. Count 8 syllables from both ends of a line. If all the syllables in the line are exhausted and a word boundary is left, then put a pada boundary there. 
3. Otherwise, count either 7 or 8 syllables from both ends, and put a pada boundary if the syllables in the line are exhausted and a word boundary is left. 
4. If the line has only 7 or 8 syllables, count the whole line as a pada. 
5. If the line has more than 16 syllables, first count 12 syllables from both ends. If all the syllables in the line are exhausted and a word boundary is left, then put a pada boundary. 
6. Otherwise, count either 11 or 12 syllables from both ends, and put a pada boundary if the syllables in the line are exhausted and a word boundary is left. 
7. Otherwise, count 11 syllables from both ends. If all the syllables in the line are exhausted and a word boundary is left, then put a pada boundary. 
8. Otherwise, count either 11 or 10 syllables from both ends, and put a pada boundary if the syllables in the line are exhausted and a word boundary is left. 
9. Leave unsplit lines as they are.

This algorithm divides the two padyas of a line if the meter is either Gāyatī, Anuṣṭubh, Triṣṭubh or Jagati, unless the padyas are fused by crasis. About 90.5% of the output lines of Holland and Van Nooten’s text, and about 90.7% of Cardona’s text, consist of a single pada. Since the remaining 9.5% or 9.3% typically contain two padyas, we are leaving out about 8.6% or 8.5% of all the padyas. The output is then fed to the following algorithm:

10. Define an overlong syllable rime either as a long vowel followed by two consonants, of which the first is not r preceded by i or u, of which the latter is neither y or v, and which are neither mn or vn, or as a short vowel followed by three consonants, of which the last is neither v or y. (These conditions effectively exclude pada-final syllables.) 
11. Scan the line from the beginning. If there is an overlong syllable rime, return the syllable in question, three following syllables, and a pada boundary, if any. 
12. The rest of the line is fed back into 11 until there is no more positive match.

If the output ends in a pada boundary, it means often, but not always, that an overlong syllable is in cadence but not pada-final. The ratio of the output ending in a pada boundary is 13.1% in Holland and Van Nooten’s text, and 12.9% in Cardona’s. This is the possible maximal ratio of overlong syllables in non-final cadence syllables, for non-cadence overlong syllables are included if metrical restoration applies to the following three syllables. Supposing the uncounted 8.6% or 8.5% of the padyas show the same ratio, the estimated maximal ratio of overlong syllables in three non-final cadence syllables is 14.2% and 14% respectively.
If we suppose that the Ṛgveda consists only of verses with 12, 11 or 8 syllables, then these three types occupy approximately 28%, 44% and 28% respectively. The average ratio of the three cadence syllables would then be $3 / (10.44 - 1) = 31.8\%$. Since only 14.2%, 14% or less of all non-final overlong syllables occur in 31.8% of all non-final syllables, the tendency to avoid overlong syllables in cadences can be considered to be a general preference of the Ṛgvedic meter.

The following table shows the ratio of overlong syllables in cadences in each book of the Ṛgveda:

<table>
<thead>
<tr>
<th>Book</th>
<th>Van Nooten and Holland</th>
<th>Cardona</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total overlong syllables (A)</td>
<td>overlong syllables in cadences (B)</td>
</tr>
<tr>
<td>I</td>
<td>2185</td>
<td>256</td>
</tr>
<tr>
<td>II</td>
<td>588</td>
<td>68</td>
</tr>
<tr>
<td>III</td>
<td>683</td>
<td>83</td>
</tr>
<tr>
<td>IV</td>
<td>635</td>
<td>97</td>
</tr>
<tr>
<td>V</td>
<td>695</td>
<td>104</td>
</tr>
<tr>
<td>VI</td>
<td>921</td>
<td>190</td>
</tr>
<tr>
<td>VII</td>
<td>917</td>
<td>117</td>
</tr>
<tr>
<td>VIII</td>
<td>1501</td>
<td>158</td>
</tr>
<tr>
<td>IX</td>
<td>804</td>
<td>113</td>
</tr>
<tr>
<td>X</td>
<td>2341</td>
<td>291</td>
</tr>
</tbody>
</table>

The difference between the results of the analysis of Van Nooten and Holland’s and Cardona’s electronic texts seems to lie mainly in different word-sandhi rules observed. It is to be noted that the ratio of overlong syllables in cadences does not differ significantly among the family books, except it is a little higher in the sixth book, which is traditionally ascribed to the Bharadvājas.

1.3 Native grammar on consonant doubling

The meter of the Ṛgveda may avoid overlong syllable rimes in cadences, but phonological rules related to consonant clusters apparently take the opposite direction in the late Vedic period, when the Prātiṣākhyas and Pāṇini describe various kinds of consonant insertion within a cluster. The following rules are about gemination of consonants in a cluster (Varma 1929, pp.99-125, Cardona Unpubl. MSS).

Most authorities agree on doubling the first consonant of a cluster, or the second if the first is a continuant. Rules related to articulatory transition (e.g. -VSKV- > -VSTKV- in TPr. 14.9 and RPr. 6.2) could just be a microscopic description of differential phases and might have nothing to do with duration of the consonants in question; there is no doubt, however, that the gemination rules bear on articulatory duration. What is then the phonological motive for lengthening non-continuants and
Table 2 Gemination rules in the Prātiśākhyas

<table>
<thead>
<tr>
<th>Rule</th>
<th>TPr.</th>
<th>RPr.</th>
<th>VPr.</th>
<th>ŠCĀ</th>
<th>Aṣṭ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-VC₁C₂ - → -VC₁C₂C₂</td>
<td>14.1</td>
<td>6.1</td>
<td>4.99</td>
<td>3.23</td>
<td>8.4.47</td>
</tr>
<tr>
<td>-V{r,k}C - → -V{r,k}CC-</td>
<td></td>
<td></td>
<td></td>
<td>4.100</td>
<td>3.28</td>
</tr>
<tr>
<td>-V{r,k}C₁-{S,S₁} → -V{r,k}CC-</td>
<td></td>
<td></td>
<td></td>
<td>3.29</td>
<td>8.4.49</td>
</tr>
<tr>
<td>-VrC- → -VrCC-</td>
<td></td>
<td></td>
<td></td>
<td>14.4</td>
<td></td>
</tr>
<tr>
<td>-V{S,W}C- → -V{S,W}CC-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.101</td>
</tr>
<tr>
<td>-V{S,L}K- → -V{S,L}KK-</td>
<td></td>
<td></td>
<td></td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>-VSK- → -VSSK-</td>
<td></td>
<td></td>
<td></td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>-VC₁C₂      no doubling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.4.52</td>
</tr>
<tr>
<td>-VC₁C₂C₂    no doubling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.4.50</td>
</tr>
<tr>
<td>no doubling at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.4.51</td>
</tr>
</tbody>
</table>

some fricatives in those doubling rules? It is at least clear that the doubling rules are for creating geminates in certain environments, and making the syllable rime overlong is just a concomitant phenomenon, for there are rules which cancel doubling if a homorganic occlusive cluster is otherwise attained, i.e. TPr. 14.23 savarnasavargiyaparah “A letter followed by one homogeneous with itself, or one of the same mute-series, is not duplicated.” (Whitney 1868), ŠCĀ 3.2.7 sasthāne ca (na), or VPr. 4.110 savarne.

Judging from the fact that Sanskrit allows -VC or tautomorphic -VrC in word-final position, -VC₁C₁KV- and -VrC₁C₁V- can be syllabified as -VC₁C₁KV- and -VrC₁C₁V- respectively. If that observation is valid, doubling might be for creating gemination across a syllable boundary. In terms of constraint ranking, what happened between the period of the Vedic poets and the native grammarians is reranking of the constraints on syllable weight and the one on syllable boundary; at the time of the native grammarians, requiring homorganic occlusives across a syllable boundary has become a highly ranked constraint, and an overlong syllable is no longer as bad as consonants of different structure across a syllable boundary:

Early Vedic: No overlength \(\Rightarrow\) Same consonant stricture

Prātiśākhya: Same consonant stricture \(\Rightarrow\) No overlength

1.4 Native grammar on syllabification

The details given by native grammar are, however, hard to comprise by such a simplistic generalization. First, doubling is not accepted unanimously by the native grammarians: According to Aṣṭ. 8.4.51 sarvatra śākalyasya (46 doe, 48 na), Śākalya does not allow consonant doubling in any context.

Furthermore, the Prātiśākhyas teach various views on consonant syllabification including doubled consonants in TPr. 21.1–9, RPr. 1.15, VPr. 1.99–106 and ŠCĀ 1.2.15–18, based on their observation on syllable weight and the accentual property of
consonants, and some of them do not agree with what I assumed above (Varma 1929, pp.61–83, Cardona Unpubl. MSS). All texts agree on the point that a consonant adjoining vowels on both sides forms a syllable with the following vowel; in phonological terms, this amounts to the Onset First Principle, and ambisyllabic as in English intervocalic consonants is not known in Old Indo-Aryan. All texts agree on counting the first consonant of a cluster and a consonant before pause as the coda of the preceding syllable, except that Ṛk-Prātiṣākhya 1.25 admits the former as optional and does not mention the latter. They also agree on a syllable boundary between the geminate consonants arising before an occlusive, except it is optional according to Ṛk-Prātiṣākhya 1.25. As to the gemination after liquids (and h), the Vājasaneyi-Prātiṣākhya and Śaunakiya-Caturādhīyāyikā 1.2.18 put a syllable boundary between the geminate consonants, and the Taïtirīya-Prātiṣākhya tacitly assumes it (Whitney 1868, p.380), while Ṛk-Prātiṣākhya 1.26 does not allow it.

Cardona (op. cit.) shows that Pāṇini assumes a certain syllable structure regarding the following rule, although his grammar does not mention syllabification explicitly. The rule Aṣṭ. 6.1.3 na nṛdṛḥ samyoḍādayaḥ [1 due, 2 ajāder devitīyasya] “The phonemes [n, d, r] constituting the initial of a consonant nexus [forming part of the second syllable of a polysyllabic verbal stem beginning with a vowel 2] are not [duplicated 1]. (Katre 1987)” precludes reduplication like *unindis- or *arcircisa-, which would follow from the syllabification Pāṇini assumes, namely */u.ndi.ndi.sa/- or */a.rci.rci.sa/-.

The difference among those grammatical treatises is summarized as follows.

<table>
<thead>
<tr>
<th></th>
<th>TPr.</th>
<th>RPr.</th>
<th>VPPr.</th>
<th>ŚCĀ</th>
<th>Aṣṭ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>VC</td>
<td>yes</td>
<td>o.k.</td>
<td>yes</td>
<td>yes</td>
<td>(no)</td>
</tr>
<tr>
<td>C</td>
<td>yes</td>
<td>o.k.</td>
<td>yes</td>
<td>yes</td>
<td>—</td>
</tr>
<tr>
<td>rT</td>
<td>(yes)</td>
<td>rj.T</td>
<td>yes</td>
<td>yes</td>
<td>rj.T</td>
</tr>
<tr>
<td>VC</td>
<td>yes</td>
<td>o.k.</td>
<td>yes</td>
<td>yes</td>
<td>Vj.Cj.C2</td>
</tr>
</tbody>
</table>

Related to the different views on the syllabification of consonant clusters beginning with r is svarabhakti, or anaptyxis of an extra-short a after a cluster-initial r: O→a /r__C (TPr. 21.15), while /r/ before a geminate remains unchanged (TPr. 21.16). The syllable boundary comes after r if a singleton consonant follows (TPr. 21.6), whereas the syllable ends in rC if the C is the first element of a geminate (TPr. 21.5), providing a further support for the idea that a geminate is preferred to a homorganic cluster or a cluster of consonants with different stricture across a syllable boundary.

The svarabhakti after r also implies that an r cannot end a syllable just as it cannot end a word, and that a heterorganic cluster with a syllable boundary in it must be repaired. To the heterorganic clusters other than rC across a syllable boundary,
another repair process applies, namely abhinidhāna or checking of the stop release (Allen 1953, p.70ff., Varma 1929, p.137ff.): The first of a stop cluster (ŚCĀ 1.2.4, RPr. 6.17), and a word-final stop or a semivowel (ŚCĀ 1.2.5, RPr. 6.5), are pronounced without release.

These rules give a spectrum of restrictions on syllable coda and boundary:

<table>
<thead>
<tr>
<th>Language</th>
<th>Rime Rule</th>
<th>Coda Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pāṇini</td>
<td>-V, but possibly -VC in word final and in doubling</td>
<td>C.C.: N/A in principle</td>
</tr>
<tr>
<td>RPr.</td>
<td>-VC is optionally allowed if unreleased</td>
<td>C.C.: need not be homorganic</td>
</tr>
<tr>
<td>ŚCĀ</td>
<td>-VC is acceptable if unreleased</td>
<td>C.C.: must be homorganic</td>
</tr>
<tr>
<td>TPr./VPr.</td>
<td>-VC is fine</td>
<td>C.C.: must be homorganic</td>
</tr>
</tbody>
</table>

1.5 Indo-Aryan innovation

These observations of native grammarians on syllable boundary are different from the original tendencies of Proto-Indo-European in two respects. In the first place, geminate consonants in Indo-European languages all result from place assimilation of heterorganic consonants, with a possible exception of the geminate in Hittite atta- ‘father’, Greek ἄττα etc. (Szemerényi 1990, p.115). There is no gemination in Avestan, an Iranian language closer to Vedic than any other Indo-European languages (Hoffmann and Forssman 1996, p.108). Secondly, we discussed above in 1.1 and 1.2 that many Indo-European languages and the meter of the Rgveda share a tendency to avoid overlong rimes, which does not seem to take precedence in the gemination rules of the native grammar.

Since Brugmann’s Law blocks lengthening and lowering of PIE *ō before a consonant cluster, it naturally follows that Proto-Indo-Iranian syllabifies the first consonant of a cluster as a part of the syllable to its left.3) Comparison of Avestan with corresponding Vedic forms, however, suggests a difference between Iranian and Indo-Aryan ways of cluster syllabification. In syllable onset, Avestan allows more diverse obstruent clusters than Vedic: OYAv. ptā̄ ~ OAv. tā nom.sg. ‘father’ : Ved. pītā́; YAv. fštāna- ‘breast’ ~ Ved. stāṇa-; OAv. zdī ‘bel’ : Ved. edhiʾ< *az-dhīʾe-s-dhīʾ; YAv. xštuu-am. ‘sixth’.

On the other hand, the variety of consonants occurring in word-final position is not as broad as in Vedic, given that many of them end in a sibilant and -t probably has no release (Morgenstierne 1942, p.70f.): -m, -n̥g (< *ms), -t, -s(<cā/a), -st (< *s-t), -št, -x̄, -s̄ and -r̄.4) These coda clusters with s make a sharp contrast with Vedic, where a

3) See Kuryłowicz (1977, p.166ff.) for a morphological account for Brugmann’s Law.

4) For Bartholomae’s equation of OAv. yaugat with Ved. *a-yok, where the former is claimed to preserve the final cluster of PIIr. *a-iauk- better, see Kellens (1974, p.299f).
sibilant cannot become a coda unless followed by a voiceless stop; in this respect, Avestan is closer to Greek, which allows a final stop only when followed by a sibilant, e.g. Greek μέλι ‘honey’<m/melit-/, γάλα ‘milk’<g/galakt-/: thrēs ‘hair’. If this distribution of consonants in initial and final positions reflects an internal syllable structure, it would follow that Avestan favors a zero or minimal coda while it allows consonants to be crammed in the onset.

Anaptyxis of internal clusters, another strategy of Avestan to repair coda consonants, is extensive but not very consistent, partly due to the period and the region Old and Younger Avestan represent, and partly due to the untransparent assimilation of voicing and frication among consonants. Anaptyctic ṣ breaks internal clusters, particularly in Old Avestan (Hoffmann and Forssman 1996, p.51): YAv. nāmasṭē : Ved. nāmas te; OAv. karpā ‘ritualist’. ṣ is inserted after r in Old Avestan and Younger Avestan, except before ɾː and ɾː, and in *á/rat (>) ɾː, *á/ark and *á/arp (>hr), e.g. OYAv. arṭa- : Ved. ārtha-; OYAv. vādarḥ : Ved. vādhar; PIr. ṣvṛka- > YAv. vṛhka-; *ārta > OYAv. aṣa- (Hoffmann and Forssman 1996, pp.51,92).

Among the native grammarians’ restrictions on consonant clusters (1.4), those of Pāṇini, and of the Rk-Prātiṣākhya to a smaller extent, resemble Avestan treatment of coda consonants. If the descriptions of these grammarians reflect actual dialectal features of the schools they belong to, their dialects, which were probably distributed in the upper Indus valley and the Punjab, might reflect a transitional state between Indo-Aryan and Iranian.

2.1 Syllable weight in Dravidian

While vowel length alternates in Indo-European languages depending on the grammatical context the morpheme in question is in, short and long vowels make phonemic contrast in Dravidian (Krishnamurti 1955, p.237):


While geminates are usually of secondary origin and there is no grammatical gradation of consonant length in Indo-European languages, long or geminate consonants in Dravidian make contrast with their singleton counterparts typically in derivational and inflectional alternations: Non-past transitive suffix *kk, *pp : non-past
intransitive suffix *k, *p; past transitive suffix *tt: past intransitive suffix *t (Krishnamurti 1978, p.18f); nominative Ta. kāṭu ‘jungle’, Pj. key ‘hand’: +oblique suffix PDr. *tt- Ta. kāṭ, Pj. keyo (Krishnamurti 1961, p.259, Kumarsawami Raja 1969, p.84). Note, however, that there are Proto-Dravidian phonological rules which do not treat a root-final consonant as having its own mora:5) e.g. *ī+t>*ī as in the pair Ta. √nil ‘stand’: Ta. √nigu ‘place’.

If Proto-Dravidian phonology have the notion of syllable weight, it could well be reflected as reconstructible weight-sensitive rules or restrictions on syllable weight as in Indo-European. Such rules are hard to find, however. In the derivation of verbal bases, stem-formative vowels *a, *i or *u are inserted between roots and suffixes beginning with consonants already in Proto-Dravidian (Krishnamurti 1978, p.18): PDr. *tir-u-mpp- ‘turn’>*tirppu-Te. trippu; PDr. *tir-u-mpp->Ta. tirppu. This anaptyxis does not necessarily make an argument for weight-sensitive rules in Proto-Dravidian, for avoidance of unallowed clusters of heterorganic non-continuants or of their undesirable assimilation can also be the motivation. Krishnamurti (1961, p.125) notes that vowels with different grades are sometimes reconstructed in Proto-Dravidian, for example *kān- : *kāñ- ‘to see’ etc. with -VC and -VCC rimes, and mentions the possibility of common alternation. Rule status of this alternation between -VC and -VCC claimed by Zvelebil (1967/1970, p.185) is untenable according to Subrahmanyam (1983, pp.168-171) and Krishnamurti (1991, p.165), for the cases of the alternation is small in number and a commoner alternation between -VC and -VCC as in PDr. *yāgu ‘river’: *yāṭṭu obl. exists.

2.2 Difference between Indo-Aryan and Dravidian length alternation

Alternation of vowel length in Indo-European is usually an adjustment of the weight of the syllable to which the vowel in question belongs to. For example,

**OSTHOFF’S LAW**

\[
\text{V} > \text{V} / \text{L,N} \quad \text{Greek, Latin etc.}
\]

**SIEVERS’S LAW**

PIE *i, *u > Ved. iy, uv / VXC_V Vedic, Germanic

**COMPENSATORY LENGTHENING**

VC > V / _\text{L} \quad \text{Latin etc.}

**LACHMANN’S LAW**

V > V / _\text{Tvoiced}-t6- \quad \text{Latin}

**SHORTENING OF AN UNACCENTED VOWEL**

\[
\text{V} > \text{V} \quad \text{Anatolian}
\]

There are also weight-related rules which refer to morphological entities or prosodic contexts:

**IAMBIC SHORTENING in Latin:** Latin \[\text{V} > \text{V} / \text{VC}_-\], \[\text{V} > \text{V} \quad \text{E.g. amā > ama, putā > puta (Sommer and Pfister 1977, p.104ff.)}.


**VOCALIS ANTE VOCALEM CORRIPITUR:** Latin: V > V / _V. Homeric Greek, Vediac: V

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5) Krishnamurti (1998, p.66), “*nit, *nitt, and *kāṭ are represented as bases within Proto-Dravidian, perhaps restructured with the past suffix incorporated as a derivative at a later stage, still within P[proto-]D[raidian].”

optional lengthening of subminimal word: The vowel of an orthotonic monomoraic word is optionally lengthened, e.g. Vedic nū ~ nū́ ‘now’.

With a possible exception of Vocalis antе VOCALEM, these phenomena are either language-/category-specific or cross-linguistic, and we could say that Indo-European does not have a rhythmic rule in its grammatical system. In other words, Indo-European rules on vowel length are usually local and phonological: They refer only to phonological contexts such as the syllable the vowel in question belongs to.

Weight rules in Dravidian, on the other hand, seem to operate on a morphemic basis. Krishnamurti (1955, p.248) summarizes the distribution of Telugu root types caused by prehistorical vowel shortening as follows:

<table>
<thead>
<tr>
<th>suffix type</th>
<th>suffix</th>
<th>root</th>
</tr>
</thead>
<tbody>
<tr>
<td>strong</td>
<td>-Ṽ (N/T)T</td>
<td>(C)ṼR-</td>
</tr>
<tr>
<td>weak</td>
<td>-(N/T)T</td>
<td>(C)Ṽ-, (C)ṼR-, (C)Ṽ-</td>
</tr>
<tr>
<td>strong</td>
<td>-ṼR</td>
<td>(C)ṼR-</td>
</tr>
<tr>
<td>weak</td>
<td>-R</td>
<td>(C)Ṽ-</td>
</tr>
</tbody>
</table>

The long root vowels are shortened before suffixes beginning with vowels whereas they remain long before suffixes beginning with consonants. This alternation makes reference to the morphological context and keeps the total weight of the root morpheme stable.6) Note also C₁ ṼC₂ : C₁ ṼC₂- (Krishnamurti 1955) as in *yān- ‘I’ : *yān-V obl. This length alternation makes a sharp contrast with Sievers’s Law in Indo-European which eliminates overlong syllables created by suffixation.

2.3 Maximal syllable rimes in Dravidian

Proto-Dravidian roots are considered to be ultimately monosyllabic, and they fit the shape C₁ṼC₂ (Krishnamurti 1992, p.374). If all Dravidian nouns are derived from roots, the heaviest tautomorphemic rime is that of the root in -ṼC.

Subrahmanyan (1983, p.22) gives the following forms as possibly reconstructible cases of tautomorphemic *(C)VCC- sequences, which would be called ‘overlong’ in Indo-European:

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6) Subrahmanyan (1983, p.160) “It should be noted that quantitative variation does not operate across a morpheme boundary.”
PDr. *kākk-ay ‘crow’ Ta. kākkai/kākkāy
PDr. *tāṇ- ‘cross’ Ta. tāṇu
PDr. *pāmp- ‘snake’ Ta., Ma. pāmpu

Furthermore, Kumaraswami Raja (1969) reconstructs a Proto-Dravidian sequence
*-NTT- which explains the correspondences such as Te. -NT- : Ta.-Ma. -TT-. If we
accept this reconstruction, there are morphemes whose reconstructed forms end in
-VCCC, although they probably go back to early suffixation. 7)

PDr. *cānkk- ‘hunger’ Pa. cākol
PDr. *cūnk- Te. sīkili ‘broom’, Ta. cikku
PDr. *kānpp/-kāmpp- Ka. gāmpa, gāṇpa ‘rustic’
(Kumaraswami Raja 1969)

While stem-formative vowels *a, *i or *u keep verbal bases from having too heavy
rimes, there seem to be noun formations in which formative vowels do not occur. Since
*-NTT- suffixes are reconstructed for noun formation as well, a few forms are
reconstructed with a very heavy rime *(C)VR-NTT:

PDr. *nālnk/-*nālnkk- ‘tongue’ > Te. nāl(u)ka, OTa. nākku, Mlt. nāglu ‘uvula’,
etc., (Burrow 1943-46, p.337); PDr. *cīy-ntt- > Ta. tīy(tt); PDr. *vāy-(m)pp-
> Ta. vāyppu ‘suitability’, Te. vāpu, vāpu; PDr. *pūy-ntt- > Te. būcu ‘mould,
mildew’ (Kumaraswami Raja 1969).

2.4 Syllable-boundary rules in Dravidian

Dravidian derivational morphology seems to presuppose the existence of syllables
ending in VC, VCC or VCCC, e.g. Ta. ēru ‘to rise’ : ēru ‘to raise’; Ta. māru ‘to change
(vi.)’ : māru ‘to change (vt.)’; Ta. dir. āru ‘river’ : obl. ārụ; Ta. root. pār ‘to see’ : past
stem. pār-ntt-; Ta. root. vāl ‘to live’ : past stem. vāl-nt-. A Proto-Dravidian vowel,
whether short or long, can thus be followed by the sequences *-TT-, *-NT-, *-NTT-, *
-RT-, *-RTT-, *-RNT- (R: liquids and *y). Since Dravidian allows only one
consonant in word-initial position, the syllable boundary is considered to fall between
the last and the last but one of a medial consonant cluster, by Kuryłowicz’s principle
that restrictions on word-initial and final clusters reflect restrictions on syllable structure.
It follows from this that Dravidian allows only homorganic non-continuants across a
syllable boundary.

7) Cf. Krishnamurti (1991, p.164) on verbal bases of this type, “It is also possible to set up a type
*(C)VCC for PDr., where CCC=NPP, but there is definitely a morph boundary here, descriptively
+NP +P (transitive) as opposed to +NP (intransitive); e.g., *kānku ‘to boil (v.i.)’: *kānkku ‘to boil
(v.tr.).”
3. Discussion

The rules of the Prātiśākhyaas produce obstruents of the same stricture (but not necessarily of the same place) across a syllable boundary at the cost of optimal syllable weight up to two moras. The situation of Sanskrit taught in the Prātiśākhyaas is not what the meter of the Rgveda favors, but it is halfway similar to Proto-Dravidian, which requires obstruents across a syllable boundary to be homorganic and non-continuant regardless of the length of the rime preceding the boundary.

When Brugmann’s Law took place between Proto-Indo-European and Proto-Indo-Iranian, an intervocalic cluster such as -VCCV- must have been syllabified as -VC.CV-. On the other hand, the distribution of consonants in Avestan onset and coda (1.5), and the syllabification Pāṇini assumes in his rules on reduplication (1.4), point to a cluster syllabification in which syllable codas are minimized. This might be an innovation of Iranian and Northwest Indo-Aryan, for the poets of the Rgveda tend to avoid a consonant cluster following a long vowel in cadences, suggesting that the first syllable of the sequence -VCCV- is heavier than that of -VCV-, i.e. they are syllabified as -VC.CV- and -V.CV- respectively.

Contrary to this tendency to avoid overlong rimes, Old Indo-Aryan as known from the Prātiśākhyaas shift the emphasis of the criteria of well-formedness from the length of a rime to the agreement of stricture across a syllable boundary. In the Prātiśākhyaas, agreement of place and stricture, or at least of stricture, of consonants across a syllable boundary, becomes more important than keeping the rime up to two moras long; and when the consonants across a syllable boundary have different stricture, a repair process gemitates one of them in order to attain the same stricture across the syllable boundary even though it may make the preceding rime overlong.

A situation similar to this is found in Proto-South-Dravidian, and probably in Proto-Dravidian as well, where a long vowel is commonly followed by tautosyllabic consonants, and where only clusters of homorganic non-continuants are allowed across a syllable boundary.

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Bibliography


