

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

From Phonetics to Grammar: Lengthening in Vedic

Götz Keydana

July 31, 2013

- 1 Szemerényi's Law and the nature of sound laws
- 2 Szemerényi's Law and phonetic realism
 - structural constraints
 - phonetic 'substitution'
- 3 Compensatory lengthening

Szemerényi's Law

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

Altindisch. [...] Ferner tritt [...] ersazdenung für den abfall des oder der auß lautenden consonanten ein; eben so bei denen auf -r, welche -r-s verlieren.

Griech. Der abfall des s bewirkt ersazdenung. (Schleicher (1871: 510-1), vgl. Szemerényi (1962: 32))

The main points:

- loss of final -s,
- lengthening of the preceding vowel.

The logical structure of Sound Laws

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- 1** A relation between phonological structures in two or more related languages is either due to chance or common heritage.
[disjunctive premise; by assumption]
- 2** (a) If the relation is due to chance, it cannot be systematic.
[premise; by definition of chance]
(b) But the relation is systematic.
[empirical premise]
(c) Thus, the relation cannot be due to chance.
[modus tollens from (a), (b)]
- 3** Conclusion: The relation is due to common heritage.
[disjunctive syllogism, from 1,2]

Spelling it out

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- The 1st premise: Search for comparable phonological structures!
 - aspirated voiced stops: Gr. /t^h-/, Ved. /d^h-/, Lat. /f-/, Goth. /d-/ etc.
 - Szemerényi's Law: Gr. -ē̄r#, Ved. -ā̄#, Lat. -er#, Goth. -ar# etc.
- The 2nd premise: Show that the relation is systematic!
- The conclusion: Apply Ockham's Razor!
 - aspirated voiced stops: PIE */d^h/ (not e.g. */t̥/).
 - Szemerényi's Law: PIE *-ē̄r# or -ē̄ (sic!).

The logical structure of Szemerényi's Law

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- 1** All stems in consonant have a N.SG. in PIE *-s.
[premise of morphological transparency and uniformity, by assumption (and defying empirical evidence!)]
- 2** stems in /r/ have lengthened grade and no ending in the N.SG.
[empirical premise]
- 3** But stems in /r/ are consonant stems. [empirical premise]
- 4** Thus, stems in /r/ have an underlying *-s in the N.SG.
[modus ponens from 1,3; but what about 2?]

Taking stock

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Szemerényi's Law is not a proper sound law.
- Szemerényi's Law may well be an artifact:
 - Premise 1 is a mere stipulation.
 - Premise 2 is ignored. Possible amendment:
 - recourse to some hidden layer:
 - either diachronic stratum
 - or underlying representation.

Minimum requirement for Szemerényi's Law:

phonetic / phonological plausibility of a (synchronic or diachronic) process $-Vrs > -\bar{V}r$.

Some core data: Vedic non-neuter root nouns

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Evidence for -s as the underlying marker for N.SG.:
 - -s is attested in stems in diphthong: *go-*, *gaus*,
 - n.b.: -s is regularly retained after nasal (in sandhi):
āvádams tvám (2.43.3), *b^hávann ud* (2.15.7) etc.
- No -s
 - after obstruents: *pád-*, (*a*)*pāt*; *tvác-*, *tvák* etc.
(sonority!),
 - after liquids: *nár-*, **nā*, Ved. *nānā* 'separately' (OAv. *nā*);
for the final /r/ cf. *pūr*, *gīr* (why?).
 - after nasals: *śvā* (why?).
- Lack of final -s implies lengthening of the preceding non-adjacent vowel.
 - But why? "Closed syllables [. . .] favor vowel shortening"
(Chene and Anderson 1979: 527).

1st scenario: structural constraints – minimal words

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Structure preservation: compensation for a syncopated syllable (Hirt 1913: 258).
- Constraints on minimal words
 - are well attested (cf. Latin, Weiss (2009: 71)),
 - are assumed for PIE by Gauthiot (1913: 68), Kapović (2006: 145) (pronouns), Byrd (2010: 89-9) (CV) and Sukač (2010: 106-7) (root nouns).
- But the constraint
 - is difficult to state: a requirement for superheavy syllables? FT-BIN?
 - predicts length in all monosyllabic (root) nouns.
→ has to be restricted in a completely ad hoc way.

1st scenario: structural constraints – word edges

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Vedic does not allow complex codas or word-final extrasyllabicity (Wackernagel (1896: 305), Kobayashi (2004: 35))
- Consequence: /s/-deletion as a repair for illicit syllable structure.
- But
 - the repair does not account for the lengthening,
 - final /s/ in underlying /-ns#/ resurfaces in sandhi (see above),
 - the same shift in syllable boundaries should be possible with final /r/ or obstruent.

'Alternation' is rooted in phonetic 'substitution'

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints

phonetic
'substitution'

Compensatory
lengthening

References

Wenn wir die gegebene Sprache irgend einer Sprachgenossenschaft in ihrem zeitlichen Nacheinander als etwas Dauerndes und Ununterbrochenes betrachten, so wird sich zeigen, dass der ursprüngliche Antrieb (Impuls) zur Entstehung einer Alternation immer rein phonetischer oder rein anthropophonischer Natur war. (Baudouin de Courtenay 1895: 21-2)

2nd scenario: degemination

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- This is the initial scenario given by Curtius (1869: 164) and later by Szemerényi (1962: 32).
 - presupposes assimilation of *-s in codas,
 - predicts length
either in /r/-stems only
or in every type of non-neuter root noun.
- But
 - the alleged assimilation is typologically and phonetically unlikely (see below),
 - cluster reduction / degemination does not lead to compensatory lengthening (Chene and Anderson 1979: 527),
 - there is no evidence for word final geminates in (Pre-)PIE (see already Bartholomae (1888: 573-4)).

3rd scenario: compensatory lengthening

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints

phonetic
'substitution'

Compensatory
lengthening

References

- This scenario goes back to Schleicher (1871), for a recent version see Hamp (1996: 139), Byrd (2010: 90), Fortson (2010: 116).
 - presupposes the loss of *-s,
 - accounts for length either in /r/-stems only or in every type of non-neuter root noun.
- Open questions:
 - Why is *-s lost?
 - Why is a non-adjacent vowel lengthened?
 - What is the exact domain of the law?

What's so bad about *-rs*?

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

Narrowing things down

Only in *r*-stems is lengthening completely regular.

- Massive undershoot in the articulation of /r/ in complex codas.
- /-rs/ is worst because of
 - shared place of articulation (Kümmel 2007: 125),
 - /s/ being a fricative (see Kobayashi's treatment of the merger of word-final /s/ and /r/, (2004: 151)).
- Articulatory result:
 - frication (Dutch (Plug and Ogden 2003), English (Harris 2013)),
 - weakening of an original trill: tap or flap (Catalan (Recasens and Espinosa 2007)).
 - *rep^hādūṣmaṇi svarapare svarab^haktirakārasyārd^haṃ caturt^hamityeke* (CA 1.4.10)

The role of the hearer

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Due to frication or flapping perceptual cues for /r/ before /s/ are weak.
- Weak cues for /r/ are reanalyzed as formant transitions triggered by the sibilant.
- Duration of /r/
 - in case of approximant [ɹ]: reanalyzed as a feature of the preceding vowel,
 - in case of flap [ɾ]: to short to be parsed.
- Perceptual result:
 - hypocorrection (Ohala 2012):
[Vɹs] → /V̄s/
[Vrs] → /Vs/
 - examples: non-rhotic English dialects (r-loss first in rs-clusters (Jordan 1925: 150)), Dutch (Scobbie et al. 2009), Turkish dialects (Kavitskaya 2002: 55-6).

The nature of compensatory lengthening

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

Compensatory lengthening is hypocorrection.

Phonetics: The articulatory effort for consonants in clusters is weakened (Chene and Anderson 1979: 508,517).

Phonology: Perceptual features intended as cues for a given segment are taken as cues for adjacent segments. (Ohala 1981)

- In V-lengthening the trigger typically follows the target
- Because of its phonetic grounding, compensatory lengthening can only target adjacent segments (Curtius (1869: 163), Chene and Anderson (1979: 517), Kavitskaya (2002: 37,107)).

Consequences for Szemerényi's Law

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- The only possible **phonetic** source for length in the N.SG. is hypocorrection in *r*-stems:
 - no /-rs/ codas in Vedic and probably PIE,
 - word-final plosive + /-s/ cannot undergo hypocorrection since it cannot surface at all in Vedic (and probably PIE),
 - nasals are not weakened in PIE and Vedic: /-ns/ attested (at least in sandhi).
- PIE */r/ ([cor], [+ ant]) in the coda before obstruent was most probably [ɹ].
- Lengthened grade in *r*-final stems due to compensatory lengthening.
- But: the expected outcome is †*nās*, PIE †**h₂nēs*! (cf. Att. *μαρτυς* besides Cret. *μαῖτυρος*)

Why $nā(r)$, PIE $*h_2nēr$? The role of morphology

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Already in PIE the hypocorrection was superseded by a morphophonological development which reinstated the final /r/:
 - importance of the root for lexicon retrieval,
 - paradigm uniformity.
- The lengthening became opaque
 - no more phonetic grounding,
 - no recoverability for underlying short vowel.
- and spread into other paradigms and / or into the strong stem as a morphophonological device.
 - in extremis: neuter N.SG. with long vowel like Ved. $b^hūmā$ besides $b^hūma$

The Avestan development: Ruki and extrasyllabicity

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Treatment of *-r-*stems like in Vedic, N.SG. in *-ā*.
- But: palato-alveolar articulation of *s* allows for reintroduction of */-rs/* in new environments:
 - OAv. *ātarš*, secondary animate (probably YAv. influence, see Vaan (2003: 523, 531)),
- Av. allows for extrasyllabicity:
 - */-s/* (re-)introduced in stems in obstruent, length remains: OAv. *vāxš*, YAv. *āfš*.

The whole story

Lengthening in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints

phonetic
'substitution'

Compensatory
lengthening

References

- Articulatory weakening of /r/ in complex codas.
- Hypocorrection: $-Vrs > -\bar{V}s$.
- Morphological uniformity / recoverability: $/-\bar{V}s/ > /-\bar{V}r/$.
- Opacity and reanalysis of the lengthened grade as marker for N.SG.
- Spreading of the marker throughout the system.
- Further Ilr.[?] development (loss of final /r/ in the N.SG.).

Or? Back to de Saussure and Brugmann!

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

*Pour ce qui concerne ce dernier point
[l'allongement, G.K.], nous nous permettrons
seulement d'attirer l'attention sur le parallèle
sákhā(i) – Αητώ ... (Saussure 1879: 213)
Nous adoptons la théorie où l'allongement provient
d'une cause (inconnue) autre que l'action de l's
... (1879: 213)*

*Stämme auf formantisches -n, -r zeigen
dehnstufige Schlussilbe ... (Brugmann 1911:
125)*

*Einzel sprachlich fand Neuschöpfung nach der
Analogie von Nominativen auf -s statt. (1911: 127,
cf. Bartholomae (1882: 30))*

References I

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Bartholomae, C. (1882). *Arische forschungen. Erstes heft*. Niemeyer, Halle.
- Bartholomae, C. (1888). Die arische flexion der adjektiva unt partizipia uf *nt-*. *Kuhn's Zeitschrift*, 29:487–588.
- Baudouin de Courtenay, J. N. (1895). *Versuch einer Theorie phonetischer Alternationen: Ein Capitel aus der Psychophonetik*. Trübner, Strassburg.
- Brugmann, K. (1911). *Vergleichende Laut-, Stammbildungs- und Flexionslehre nebst Lehre vom Gebrauch der Wortformen der Indogermanischen Sprachen*, vol. 2. Trübner, Strassburg, 2nd edition.
- Byrd, A. M. (2010). *Reconstructing Indo-European Syllabification*. PhD thesis, UCLA, Los Angeles.
- Chene, B. d. and Anderson, S. R. (1979). Compensatory lengthening. *Language*, 55(3):505–535.
- Curtius, G., (1869). *Studien zur griechischen und lateinischen Grammatik*, vol. 2. Hirzel, Leipzig.
- de Vaan, M. (2003). *The Avestan Vowels*. Rodopi, Amsterdam; New York.
- Fortson, B. W. (2010). *Indo-European Language and Culture*. Wiley-Blackwell, Malden, MA, 2nd edition.
- Gauthiot, R. (1913). *La fin de mot en indo-européen*. Geuthner, Paris.
- Hamp, E. P. (1996). The nominative singular of *r*-stems. *Baltistica*, 31(2):139–140.
- Harris, J. (2013). Wide-domain *r*-effects in English. *Journal of Linguistics*, 49(2):329–365.
- Hirt, H. (1913). Fragen des Vokalismus und der Stammbildung im Indogermanischen. *Indogermanische Forschungen*, 32:209–318.
- Jordan, R. (1925). *Handbuch der mittellenglischen Grammatik*. Winter, Heidelberg.
- Kapović, M. (2006). *Reconstruction of Balto-Slavic Personal Pronouns with emphasis on accentuation*. PhD thesis, University of Zagreb.
- Kavitskaya, D. (2002). *Compensatory Lengthening: Phonetics, Phonology, Diachrony*. Routledge, New York.
- Kobayashi, M. (2004). *Historical Phonology of Old Indo-Aryan Consonants*. Research Institute for Languages and Cultures of Asia and Africa. Tokyo University of Foreign Studies, Tokyo.

References II

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

- Kümmel, M. J. (2007). *Konsonantenwandel. Bausteine zu einer Typologie des Lautwandels und ihre Konsequenzen für die vergleichende Rekonstruktion*. Reichert, Wiesbaden.
- Ohalá, J. (2012). The listener as a source of sound change: an update. In Solé, M.-J. and Recasens, D., editors, *The Initiation of Sound Change. Perception, production, and social factors*, 21–35. Benjamins, Amsterdam.
- Ohalá, J. J. (1981). The listener as a source of sound change. In Masek, C., Hendrik, R. A., and Miller, M. F., editors, *Papers from the Parasession on Language and Behavior (of the 17. Regional Meeting)*. Chicago Linguistic Society, Mai, 1-2, 1981, 178–203, Chicago.
- Plug, L. and Ogden, R. (2003). A parametric approach to the phonetics of postvocalic /r/ in Dutch. *Phonetica*, 60:159–186.
- Recasens, D. and Espinosa, A. (2007). Phonetic typology and positional allophones for alveolar rhotics in Catalan. *Phonetica*, 64:1–28.
- Saussure, F. de (1879). *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*. Teubner, Leipsick.
- Schleicher, A. (1871). *Compendium der Vergleichenden Grammatik der Indogermanischen Sprachen*. Böhlau, Weimar, 3rd edition.
- Scobbie, J. M., Sebregts, K., and Stuart-Smith, J. (2009). Dutch rhotic allophony, coda weakening, and the phonetics-phonology interface. Working Paper 18, Speech Science Research Center, Queen Margaret University, Edinburgh.
- Sukač, R. (2010). Some notes on the accent and ablaut relationship in PIE. In Dočkalová, L., editor, *Indoevropská fonologie a morfológie*, 71–118, Brno. Masarykova univerzita.
- Szemerényi, O. (1962). *Trends and Tasks in Comparative Philology: An Inaugural Lecture Delivered at University College, London, 23 October 1961*. Lewis, London.
- Vaan, M. (2003). *The Avestan Vowels*. Rodopi, Amsterdam; New York.
- Wackernagel, J. (1896). *Altindische Grammatik. Band 1. Lautlehre*. Vandenhoeck & Ruprecht, Göttingen.
- Weiss, M. (2009). *Outline of the Historical and Comparative Grammar of Latin*. Beech Stave Press, Ann Arbor.

Lengthening
in Vedic

Götz
Keydana

Szemerényi's
Law and the
nature of
sound laws

Szemerényi's
Law and
phonetic
realism

structural
constraints
phonetic
'substitution'

Compensatory
lengthening

References

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