The Accentuation of East Baltic Reflexes of PIE Root Nouns

Yoko Yamazaki, Stockholm University

IWoBA X, University of Ljubljana October, 2014

1 Introduction

1.1 Preliminaries

- de Saussure (1894: 492ff.) hypothesized that PIE long vowels (and also long diphthongs (Kuryłowicz 1948: 1ff.)) are reflected with the acute tone in Balto-Slavic (BS), whereas Kortlandt (1985) considers they yielded circumflex. While *žvėrìs* (3) 'wild animal' (acc.sg. *žvė́rį*) < PIE **ĝʰu̯ḗr* speaks for Saussure's view, the nominative singular ending of consonantal stems (-*uõ*, -*ẽ*) and many monosyllabic forms speak for Kortlandt's view.

- The phonetic realization of "acute syllable" remains unclear. The "acuteness" of a syllable nucleus will be denoted with an <u>underline</u> following a convention introduced by Jasanoff (2004).

- Monosyllabic Circumflexion (MC) is a phenomenon according to which long vowels in monosyllabic words exhibit a circumflex tone instead of the expected acute (in the Balto-Slavic languages ∼ Lithuanian; Hanssen (1885: 616), Zinkevičius (1980–81: II, 161ff.), Rasmussen (1999: 481ff.));

  1. pronominal forms (***tiẽ*** [< **toi* pl.nom. ∼ *ger**íe**ji* 'the good (pl.nom)'], ***tuõ**s* [< **-ŏns* pl.acc. ∼ *ger**úo**sius* 'id. (pl.acc.);' Zinkevičius 1980–81: II, 162])
  2. ➽ **reflexes of PIE root nouns** (Latv. ***gùo**vs* 'cow' [< **gʷŏ̯us* ← acc.sg. **gʷŏm* (Larsson 2010: 73ff.); (Villanueva Svensson 2011: 20)][1]
  3. prepositions/adverbs (*nuõ* 'from' ∼ *núotaka* 'bride' [Zinkevičius: id.]; *vẽl* 'again' ∼ Latv. *vêl* 'still, yet' [< PB **vēli*; Būga 1924: 95]; *võs* 'hardly' ∼ OCS *jedьva*, SCr *jèdva*, Čak. *jedvä*; PBS **edvāsʰ*)
  4. 3rd person future forms of monosyllabic stems
     šõks – *šókti* 'to jump;' *vỹs* – *výti* 'to drive,' etc.

[1] ***šuõ*** 'dog' [< **k̂u̯ó*] (Hanssen 1885) may be an *n*-stem noun, but this can be also considered to have been in the environment of MC.

1.2 Data

The Baltic reflexes of the PIE nouns which are securely reconstructed as root-nouns with "long root" according to preceding works, e.g. Schindler (1972); Larsson (2010); Villanueva Svensson (2011):

(1) a. *nósis* (1) 'nose' (∼ Latv. *nãss*)

b. *žvėrìs* (3) 'wild animal' (∼ Latv. *zvẽrs*)

c. *širdìs* (3) 'heart' (∼ Latv. *sîrds*), *šerdis* (1/3/4; ∼ Latv. *seŕde*) 'core of wood'

(2) Latvian forms to be considered

a. *sȁls* 'salt' (m./f.)
b. *gùovs* 'cow' (f.)

- They are typically *i*-stems in Baltic (and Slavic; see below).
- The nominative singular and accusative singular under certain environments were monosyllabic. The possibility that at least the Latvian forms (2a) and (2b) may reflect the result of MC has been pointed out.

1.3 Research question

Whereas the circumflex tone of the Latvian forms in (2) seems to exhibit the result of MC, the acute tone of other forms in (1) does not. How could MC affect those forms to give rise to different tones in them? What is the relative chronology?

2 Brief summary of preceding works

2.1 Morphological history of root nouns: PIE ∼ PBS

- In nom.sg., the root could be lengthened either by Szemerenyi's Law [e.g., $*\hat{g}^h\underset{\frown}{u}er\text{-}s > *\hat{g}^h\underset{\frown}{u}\bar{e}r$ as in Gk. ϑήρ, -ός, Lith. *žvėrìs* 'wild animal'] or by the loss of a consonant in the final consonant cluster [**pod-s* > **pōd*; Sihler (1995: 130, 280)], or secondarily by Stang's law (Stang 1965: 292ff.).

- Expansion of syllabic resonants (**R̥ > iR*) affected the accusative endings (PIE **-m̥* (sg.acc.)/**-m̥s* (pl.acc.) > PBS **-in / *-ins*), together with nom.du. *-ī* (< **-ih*$_1$), causing root nouns to join *i*-stems (Vaillant (1958: 169ff.); Stang (1966: 219); Larsson (2010: 34ff.)) → monosyllabic forms in nom.sg. resulted in disyllabic forms.

2.2 MC and root noun

- Rasmussen (1999: 480ff.) discusses the possibility of MC to be traced back to a PBS stage, based on pronominal forms, *s*-aorist forms in Slavic, and alleged root-nouns.

  However, in light of the discussions in Larsson (2002) and Larsson (2010), Rasmussen's analysis should be applied to better-established root nouns. The same can be applied to the list of root nouns found in Kortlandt (1985: 117ff.), Kortlandt (1997: 26).

- Larsson (2010: 73ff.) discusses a possibility that MC affected the tone of *$*g^w$

̃us / $*g^w$ ítm* 'cow' and *sā́l-s* 'salt.' Also, it is implied that MC was prior to the generalization of *i*-stem.

- Villanueva Svensson (2011: 19ff.):
  - for (2b), the monosyllabic *$*g^w$ōm* is likely to have been inherited in PBS as well as in other IE languages; *$*g^w$ ítm > $*g^w$ ĩtm*.
  - B-S could inherit two different paradigms:
    (3) a. nom.-acc.sg. ***nā́s-*** / obl. **nás-* (= 1a)
    b. nom.-acc. sg. ****ĝ^{h}u̯ḗr-*** / obl. *$*ĝ^h$u̯ér-* (= 1b)
    (4) a. nom.sg. *$*ĝ^h$ā́ns-* / acc.sg. ****ĝ^{h}áns-*** 'goose'
    b. nom.sg. ****sā́l-*** /acc.sg. **sál-* (= 2a)
    While (3a), (3b), (4a) are derived from the stem of accusative-origin, (4b) from the nominative-originated stem.
  ➻ Why was nominative favored for particularly (4b)?

3 Ablauting/leveled paradigms inherited in PBS and PB

As observed in previous studies, the East Baltic accentuation of the former root nouns does not look coherent. I will clarify how MC could have affected the paradigms of the nouns in (1) and (2), looking into the ablaut pattern (suggested in Villanueva Svensson 2011) and the relative chronology of MC.

3.1 A special case: Latv. *gùovs* [2b]

cognates:

other IE:	Skt. nom.sg. *gáus*, acc.sg. *gā́m*, gen.sg. *gós* 'cow;' Gk. βοῦς, acc.sg. βοῦν (Dor. βῶν); Lat. *bōs*;
PIE:	nom.sg. *$*g^w$ou̯-s* (→ *$*g^w$ōu̯s*), acc.sg. *$*g^w$ou̯-m* (> *$*g^w$ōm* [Stang's Law]), gen.sg. *$*g^w$eu̯-s*

- no evidence for BS ablauting paradigm; but it is possible that BS inherited a monosyllabic accusative singular form with a long root because of the operation of Stang's law in late PIE: *$g\tilde{o}m$ (< *$g^w\bar{o}m$ < *$g^w o\underset{\frown}{u}m$).

- The reconstruction *$g^w eh_3$-*us*/*$g^w h_3$-*ou-s* → *$g^w \bar{e}h_3$-*us*/*$g^w h_3$-*ou-s* (influence from *$d\underset{\frown}{i}\bar{e}\underset{\frown}{u}s$ 'god'; Kortlandt 1985: 118; Lubotsky 1990: 133) may pose a few problems. For example, it is never scanned disyllabic (as opposed to *náus*) in Vedic, and some case forms (acc.sg. and loc.sg.) do not match the attested forms at all (Sihler 1995: 335).

- Probably, the *i*-stem was generalized to nom.sg. *$g\tilde{o}\underset{\frown}{u}s$/acc.sg. *$g\tilde{o}m$ analogically after other root nouns shifting to *i*-stems. When the stem-forming *-i-* was introduced to the paradigm, the accusative *$g\tilde{o}m$ got *-v-* inserted in the root-final position as a hiatus breaker to result in *$g\tilde{o}vi$-*m*. The paradigm was leveled with the new nom-acc. stem *$g\tilde{o}vi$-.

- relative chronology: acute assignment → MC → generalization of *i*-stem → Osthoff's Law (shortening of long diphthong: *$\bar{V}R > \breve{V}R$)
  - MC premises the existence of the distinction of acute/non-acute: acute assignment → MC
  - MC should be prior to the generalization of *i*-stems.
  - if Osthoff's law took place before the generalization of *i*-stems, it would have given rise to ✗*gous* or possibly ✗*gom* (→ Latv. ✗*gavis*).

'cow'

	nom.sg.	acc.sg.	gen.sg.
PIE	*$g^w o\underset{\frown}{u}s$	*$g^w o\underset{\frown}{u}m$ (> *$g^w\bar{o}m$)	*$g^w e\underset{\frown}{u}$-*s*
	*$g^w\bar{o}\underset{\frown}{u}s$	*$g^w\bar{o}m$	*$g^w e\underset{\frown}{u}$-*s*
PBS	acute assignment to long vowels		
	*$g\underline{\acute{o}}\underset{\frown}{u}s$	*$g\underline{\acute{o}}m$	*$ge\underset{\frown}{u}$-*s*
	MC		
	*$g\tilde{o}\underset{\frown}{u}s$	*$g\tilde{o}m$	*$ge\underset{\frown}{u}$-*s*
	analogical generalization of *i*-stem with the vocalism in strong cases with the epenthesis of *v* in the accusative stem-final position		
	*$g\tilde{o}vi$-*s*	*$g\tilde{o}vi$-*m*	*$g\tilde{o}vi$-*es*
	Osthoff's Law: vacuous operation		

3.2 Paradigms with simplified ablaut pattern in PBS

3.2.1 *žvėrìs* (3) 'WILD ANIMAL' [1B]

cognates:

Baltic:	Latv. *zvẽrs* < PB **źvēris*
Slavic:	OCS*zvěrь*, SCr. *zvȉjer*, Sln. *zvẽr* < PS **zvêrь* (c)
PBS	**źvēris* ← **źvēr* < PIE **ĝʰu̯ēr*
other IE:	Gk. θήρ, θηρός (m.), Lat. *fera* 'wild beast'

'wild animal'

	nom.sg.	acc.sg.	obl.
PIE	**ĝʰu̯ér-s* (> **ĝʰu̯ēr*)	**ĝʰu̯ér-m̥*	**ĝʰu̯r̥-´*
PBS	**simplification of ablaut** and palatalization of **ĝʰ*		
	**źvḗr*	**źvḗr-m̥*	**źver-´*
	acute assignment to long vowels and extension of syllabic resonant		
	**źvḗr*	**źvḗr-im*	*źver-´*
	MC		
	**źvẽr*	**źvḗr-im*	*źver-´*
	generalization of accusative stem in *i*-stem		
	**źvḗri-s*	**źvḗri-m*	**źvēri-*
	Osthoff's Law: vacuous operation		

- Since Lithuanian and Latvian forms point to the acute root with the mobile paradigm, it was not affected by Hirt's Law. That speaks against the existence of a root-final laryngeal.

- The generalized stem **źvḗri-* provided the attested forms.

3.2.2 *nósis* (1) 'NOSE' [1A]

cognates:

Baltic:	Latv. *nãss* 'nostril,' *nãse* 'nose' < PB **nāsis*
Slavic:	OCS *nosъ*, SCr. *nôs*, *nȍsa*, Sln. *nọ̑s* < PS **nosъ* (c) ← **nósa* [nom.pl ← nom./acc. du. (Fritz 1996: 15)[2]] < **nás-oh₁*
other IE:	Skt. *nās-/nas-* (f.) 'nostril' (du. *nā́sā* 'nose'), Lat. *nāris* (f.)/*nārēs* (f.pl.) 'nose,' PGmc. **nasō* (f.; < du. **nás-oh₁* cf. Kluge 1882: 509ff; Thöny 2013: 145ff.)

[2]Fritz (1996: 15) reconstructs an amphikinetic paradigm derived from a root **h₂enh₁-* 'breathe,' i.e., nom.sg. **h₂énh₁-ōs* / acc.sg. **h₂énh₁-os-m̥* / gen.sg. **h₂n̥h₁-s-és*. He considers in Baltic this paradigm developed to PB nom.sg. **nōs* (< PIE **h₂nōs* < **h₂n̥h₁-ōs*) / acc.sg. **násim*, where the root was leveled with **-ā-*, with the length from nom.sg. and the quality of the

			‘nostril’		
	nom.sg.		acc.sg.	obl.	nom.du.
PIE	(*nás-s? >) *nā́s		*nás-m̥	(*n̥s-? →) *nas-	*nás-(i)h$_1$ (→ *nás-oh$_1$)
Late PIE			semantic split of paradigm		
				↙ ↘	
		‘nostril’			↓
	nom.sg.	acc.sg.	obl.		‘nose’
	*nā́s	*nás-m̥	*nas-´		*nás-oh$_1$
late PIE					loss of laryngeal
	*nā́s	*nás-m̥	*nas-´		*nás-ō
					(→ PS / PGmc.)
PBS	**simplification of ablaut**				
	*nā́s	*nā́s-m̥	*nas-´		*nas-ō
	acute assignment to long vowels and extension of syllabic resonant				
	*nā̱́s	*nā̱́s-im	*nas-´		*nas-ō̱
			MC		
	*nã̄s	*nā̱́s-im	*nas-´		*nas-ō̱
	generalization of accusative stem in *i*-stem for ‘nostril’				
	*nā̱́si-s	*nā̱́si-m	*nā̱si-´		*nas-ō̱

- Skt. gen.du. *nas-ós* speaks against the weak stem *nh_2s- of the reconstruction *neh_2s-/*nh_2s-*os* (Kortlandt 1985:118), since neither *$n̥h_2s$- (> Skt. ✗*ās-*) nor *$nh̥_2s$- (> ✗*nis-*) would give rise to the attested weak stem Skt. *nas-´*, cf. Larsson (2010: 83).

- Besides, an acrostatic paradigm with *ā́* ∼ *á* ablaut (Rasmussen 1989: 260; Larsson 2010: 84) and a mobile paradigm with *á* ∼ ∅ (Schindler 1972: 37) or *ā́* ∼ *a* ablaut (Mayrhofer 1986–96: Vol. II, 31) are suggested.

- Schindler's paradigm *nás-s* (> *nā́s) / *n̥s-´ developed to Mayrhofer's ablaut pattern *nā́s / *nas-´ ?

- The fact that Sl. *nȍsъ (c) ‘nose’ does not have the long root generalized (either in Germanic) in contrast to PB. *nā̱sis ‘nostril’ (cf. Latv. *nãss* ‘nostril,’

vowel from acc. stem. On the other side, he considers that the Slavic forms are derived from an old dual stem of the amphikinetic paradigm *h_2n-*ós*-*oh*$_1$ (> PS *nósa). Although it is questionable if it is plausible to reconstruct an amphikinetic paradigm with rather complicated combination of phonological and analogical processes, the argument for the reinterpretation of the nom.acc. dual as nom.acc.plural of the *o*-stem sounds plausible in light of similar arguments for the Germanic cognates.

nãsis (pl.) ‘nose’) suggests a possibility of a split of paradigm into ‘nostril’ and ‘nose’ in PBS or before. The paradigm for ‘nostril’ probably underwent the simplification of ablaut pattern and the generalization of accusative stem in *i*-stem.

3.3 Ablauting paradigms in PBS

3.3.1 *sà̀ls* ‘SALT’ [2A]

cognates:

Baltic:	OPruss. *sal* (unknown length of the root)
Slavic:	OCS *solь* (f.), SCr. *sô, söli*, Sln. *sọ̑ł, solî* < PS **sölь* (c)
other IE:	Gk. ἅλς, ἁλός m. ‘salt,’ f. ‘sea,’ Lat. *sāl, salis* m./n. ‘salt’

‘salt’

	nom.sg.	acc.sg.	obl.
PIE	**sál-s* (> *sā́l*)	**sál-m̥*	(**sl̥-*? →) **sal-´*
PBS	acute assignment to long vowels and extension of syllabic resonant		
	**sā̱́l*	**sál-im*	**sal-´*
	MC		
	**sã̄l*	**sálim*	**sal-´*
	generalization of *i*-stem, keeping the ablaut pattern		
	**sã̄lis*	**sálim*	**sali-*
	Osthoff’s law: vacuous operation		
	**sã̄li-s*	**sáli-m*	**sali-*

- reconstruction with laryngeal: nom.sg. **seh₂-ls* / acc.sg. **sh₂-el-m* / gen.sg. **sh₂-l-os* (Kortlandt 1985: 119).
- reconstruction as a root noun: nom.sg. **sā́l-s* / acc.sg. **sál-m̥* / gen.sg. **sl̥-ós* (→ **sál-s* or **sal-ós*; Larsson 2010: 74ff), also Sihler 1995: 282.
- the Proto Slavic form **solь* has a short root in the same *i*-stem as in Baltic. This suggests an ablauting paradigm for Proto-Balto-Slavic (Larsson 2010: 75).
- nom.sg. stem **sã̄li-* was generalized in Baltic, whereas acc.sg. stem **sáli-* in Slavic

3.3.2 *širdìs* (3) 'HEART' [1C]

Cognates:

Baltic:	Latv. *sîrds*, ' OPruss. *seyr* (/sēr/ neut. sg.nom. only in *Elbinger Vocabulary*; with *a*-stem masc. declension in Catechisms) 'heart;' Lith. *šerdis* (1/3/4), Latv. *seŕde* 'the core of wood' < PB **śerdis (*śerdis?) /*śirdís*
Slavic:	OCS *srъdьce*, Cz *sŕce* < *śirdi-* (∼ Gk. καρδίᾱ, OIr. *cride* < **k̥rdi̯om*); OCS *srĕda* 'middle,' SCr *srijèda* 'Wednesday'
other IE:	Gk. κῆρ, κῆρος (n.), Lat. *cor, cordis* (n.), Skt. *hā́rdi* (< **k̂ērd-h₂*; n.)

- reconstruction as a root noun: nom.sg. **k̂ḗr* / gen.sg. **k̂r̥d-ós* (Szemerényi 1970: 523; Sihler 1995: 282; Larsson 2010: 79)
- This may be also a special case in that it may involve a split of the paradigm in accordance to the meanings.
- Ablauting paradigm in PBS: both Baltic and Slavic preserve cognates in zero grade and *e*-grade with similar semantic variations
- **neuter** gender: cf. Lat. *cor, cordis* , Skt. *hā́rdi*, and Gk. κῆρ, κῆρος in neuter; it turned animate in a later stage in BS, through a process of neuter plural (= collective) reinterpreted as a feminine **širdā*, or through a thematization as attested by *širdai* (3/4) 'quarrel.' (Szemerényi 1970: 531[48])

'heart'

	nom.sg.	acc.sg.	obl.	nom.pl (= collective)
PIE	**k̂érd* (> **k̂ḗr*)	**k̂érd* (> **k̂ḗr*)	**k̂r̥d-´*	*k̂érd-(e)h₂* (→ *k̂ḗrd-(e)h₂*?)
PBS	palatalization of **k̂*, and Winter's law			
	**śḗr*	**śḗr*	**śr̥̄d-´*	*śḗrdā*
	Acute assignment to long vowels			
	**śḗr*	**śḗr*	**śr̥̄d-´*	**śḗrdā*
	extension of syllabic resonant			
	**śẽr*	**śẽr*	**śīrd-´*	**śḗrdā*
	MC			
	**śẽr*	**śẽr*	**śīrd-ós*	**śḗrdā*
	Osthoff's Law			

*śēr	*śēr	*śi̲rd-ós	*śé̲rdā

split of paradigm

↙ ↘

‘core’			‘heart’		
nom.sg.	acc.sg.	collective	nom.sg.	acc.sg.	collective
*śēr	*śēr	*śé̲rdā	*śí̲rd	*śí̲rd	*śí̲rdā

- PIE *k̂ēr → ··· → OPruss /sēr/ ?? (unknown accentuation)
- *śé̲rd-ā → Lith. *šerdis* (1/3 (→ 4))
- Winter’s Law should be before the acute assignment: Winter’s Law ··· → MC.
- *śí̲rd-ā (collective) → East Baltic forms (Lith. *šìrdis*, Latv. *sîrds* ‘heart;’ Lith. *širdai* (3 (→ 4)) ‘quarrel’); generalization of *i*-stem took place at a later stage, motivated by other feminine body-part terms in *i*-stem, e.g. *akìs* (4) ‘eye,’ *ausìs* (4) ‘ear,’ *nósis* (1) ‘nose’ cf. Szemerényi 1970: 531[48].
- Thus, the results of MC in this paradigm seem to have died out.

4 Conclusion

- Relative Chronology derived in this paper:

  Winter’s law/acute assignment → **MC**
  → generalization of *i*-stem among root nouns → Osthoff’s law.

- Each word or paradigm has its own history. The relative chronology of MC and the generalization of *i*-stem and various morphological changes played a major role for the reflexes of MC to disappear.

5 Excursus: *šuõ* ‘dog’ (4)

Cognates:

Baltic:	Latv. *suns* (dial. *so* [suo]), ’ OPruss. *sunis* ‘dog;’ PB *śō
other IE:	Gk. κύων, gen.sg. κυνός, OIr. *cú*^{L}, gen.sg. *con*, Skt. *śuā́*, gen.sg. *śunás* < PIE nom.sg. *k̂u̯(-)ón-s*, gen.sg. *k̂u(-)n-ós*

- It is unclear whether it was a root nouns or an *n*-stem noun.

- The ending of the nom.sg. is considered to have undergone the following sound change in PIE: **-on-s* > **-ōn* > *ō* / __ #

Szemerényi (1996: 115ff.); Jasanoff (1989: 138)

		'dog'	
	nom.sg.	acc.sg.	gen.sg.
PIE	**k̂u̯(-)ón-s*	*k̂u̯ón-m̥*	**k̂u(-)n-ós*
	**k̂u̯ṓ*		
PBS	palatalization of **k̂*, acute assignment		
	**śu̯ṓ*	*śu̯ónm̥*	**śu(-)n-ós*
	extension of syllabic resonant		
	**śṓ*	*śónim*	**śun-ós*
	MC		
	**śõ*	*śónim*	**śun-ós*
	generalization of *i*-stem??		

- **u̯* disappeared between a sibilant and a vowel; cf. Lith. *sesuõ* 'sister' ∼ Skt. *s**v**ásar-*, Goth. *s**w**istar*.

- The nominative singular of Latv. *suns* is an *i*-stem form (**sunis*), but in the Lithuanian paradigm, the *i*-stem was not generalized throughout, with the nominative singular *šuõ* still keeping *n*-stem ending (NB: in Lithuanian *šuõ* is classified as an *n*-stem synchronically). This may provide an interesting case where a trace of MC can be persistently preserved when the generalization of the accusative stem in *i*-stem has failed.

Bibliography

Būga, K. 1923/1924. "Die Metatonie im Litauischen und Lettischen" *Zeitschrift für vergleichende Sprachforschung*, *51*, 109–142; *52*, 91–98, 250–302.

de Saussure, F. 1894. "A propos de l'accentuation lituanienne (intonations et accent proprement dit)" *Mémoires de la Société de Linguistique de Paris*, *8*, 425–446. Quoted from Ferdinand de Saussure *Recueil des publications scientifiques de Ferdinand de Saussure*, Genève / Lausanne / Heidelberg: Société anonyme des éditions sonor, 1922, pp. 490–512.

Fritz, M. 1996. "Das urindogermanische Wort für 'Nase' und das grundsprachliche Lautgesetz **R̥HV* > **RV*" *Historische Sprachforschung*, *109*, 1–20.

Hanssen, F. 1885. "Der Griechische circumflex stammt aus der ursprache" *Zeitschrift für vergleichende Sprachforschung*, *27*(Neue Folge 7), 612–617.

Jasanoff, J. 1989. "Old Irish *Bé* 'Woman'" *Ériu*, *40*, 135–141.

Jasanoff, J. 2004. "Acute vs. Circumflex: Some Notes on PIE and Post-PIE Prosodic Phonology" In Adam Hyllested, Anders Richardt Jørgensen, J. T. (Ed.), *Per Aspera ad Asteriscos*, pp. 247–255. Institut für Sprachen und Literaturen der Universität Innsbruck, Innsbruck.

Kim, R. 2002. *Topics in the reconstruction and development of Indo-European accent*. Ph.D. thesis, University of Pennsylvania.

Kluge, F. 1882. "Sprachhistorische Miscellen" *Beiträge zur Geschichte der deutschen Spracahe und Literatur*, *8*, 506–539.

Kortlandt, F. 1985. "Long Vowels in Balto-Slavic" *Baltistica*, *21*(2), 112–124.

Kortlandt, F. 1997. "PIE. lengthened grade in Balto-Slavic" In Adams, D. Q. (Ed.), *Festschrift for Eric P. Hamp*, Vol. 2, pp. 26–31. Institute for the Study of Man, Washington, DC.

Kuryłowicz, J. 1948. "Le degré long en balto-slave" *Rocznik slawistyczny*, *16*, 1–14.

Larsson, J. H. 2002. "Derivative root nouns in Baltic?" *Linguistica Baltica*, *10*, 99–104.

Larsson, J. H. 2010. *Proto-Indo-European Root Nouns in the Baltic Languages*. University of Copenhagen, Copenhagen.

Lubotsky, A. 1990. "La loi de Brugmann et $*H_3e$-" In Kellens, J. (Ed.), *La reconstruction des laryngeals*, pp. 129–136. Société d'Edition Les Belles Lettres, Liège-Paris.

Mayrhofer, M. 1986–96. *Etymologisches Wörterbuch des Altindischen*, Vol. I, II. Carl Winter Universitätsverlag, Heidelberg.

Rasmussen, J. E. 1989. *Studien zur Morphophonemik der indogermanischen Grundsprache*. Institute für Sprachwissenschaft der Universität Innsbruck, Innsbruck.

Rasmussen, J. E. 1999. “Die Vorgeschichte der baltoslavischen Akzentuierung – Beiträge zu einer vereinfachten Lösung” In *Selected papers on Indo-European linguistics, Part 2*, pp. 469–489. Museum Tusculanum Press, University of Copenhagen. First published in: B. Barschel, M. Kozianka & K. Weber (Hrsgg.): *Indogermanisch, Slawisch und Baltisch.* Materialien des vom 21.–22. September in Jena in Zusammenarbeit mit der Indogermanischen Gesellschaft durchgeführten Kolloquiums (= *Slavistische Beiträge,* Bd. 285), München: Otto Sagner 1992, pp.173–200.

Schindler, J. 1972. “L’apophonie des noms-racines Indo-européens” *Bulletin de la Société de Linguistique de Paris*, *67*, 31 – 38.

Sihler, A. L. 1995. *New comparative grammar of Greek and Latin*. Oxford University Press, New York – Oxford.

Stang, C. 1965. “Indo-Européen **g^{w}ōm, *d(i)i̯ēm*” In *Symbolae linguisticas in honorem Georgii Kuryłowicz*, pp. 292–296. Zakład Narodowy imienia Ossolińskich, Wrocław.

Stang, C. 1966. *Vergleichende Grammatik der baltischen Sprachen*. Universitetsforlagedt, Oslo.

Szemerényi, O. 1970. “The Indo-European name of heart” In Draviṇa, V. R. (Ed.), *Donum Balticum*, pp. 515–533. Almqvist & Wiksell, Stockholm.

Szemerényi, O. 1996. *Introduction to Indo-European linguistics*. Clarendon Press, Oxford. Translated from *Einführung in die vergleichende Sprachwissenschaft* 4th edition, 1990, with additional notes and references.

Thöny, L. 2013. *Flexionsklassenübertritte – zum morphologischen Wandel in der altgermanischen Substantivflexion*. Institut für Sprachwissenschaft der Universität Innsbruck, Innsbruck.

Vaillant, A. 1958. *Grammaire comparée des langues slaves*, Vol. II. Paris.

Villanueva Svensson, M. 2011. “Indo-European Long Vowels in Balto-Slavic” *Baltistica*, *46*(1), 5–38.