



The prosody of the Hittite instrumental and its Indo-European ramifications

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Roadmap

- ▶ Introduction
- ▶ The vexed prosody of the instrumental case in Hittite
- ▶ Word stress in the instrumental case
- ▶ Analyzing word stress in the instrumental case
- ▶ Discussion & conclusions



The instrumental case in Hittite

- (1) a. H *išḫanda* ‘with blood’ (KBo 17.4 iii 15; OS)
b. H *witanta* ‘with water’ (KBo 20.22:5; OS)
c. H *kiššarta* ‘with the hands’ (e.g., KBo 20.8 obv. 11; OS)
d. H *ganut* ‘by the knees’ (e.g., KUB 12.63 obv. 26; OH/MS)
- (2) a. H *išḫanit* ‘with blood’ (e.g., KBo 29.89 ii 27; MS)
b. H *witēnit* ‘with water’ (e.g., KBo 40.89 obv. 6; MS)
c. H *kišrit* ‘with the hands’ (e.g., KUB 58.22 i 6; OH/NS)
d. H *GIŠ-ruit* ‘with wood’ (e.g., KUB 9.28 ii 14; MH/NS)
- Two allomorphs of the instrumental ending are attested in early Hittite (cf. *GrHL*²: 116):
 - An archaic *C(-initial) allomorph*, spelled *-t/da* after consonant and *-t* after vowel, e.g., (1).
 - A productive *V-initial allomorph* *-it*, e.g., (2).



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- Two questions **not** to be addressed today:
 - What is the Proto-Indo-European (PIE) source of these endings?¹

¹For differing views see Neu 1979: 171, Melchert & Oettinger 2009, Kloekhorst 2014: 103–5, i.a.); chronological distribution is consistent with resegmentation of ending in (1) from *i*-stems (thus *GrHL*²: 116).



The instrumental case in Hittite

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- Two questions **not** to be addressed today:
 - What is the Proto-Indo-European (PIE) source of these endings?
 - How were forms with **productive V-initial** *-it* stressed?²

²Like other V-initial oblique case endings; thus, e.g., (2c) aligns with ALL.SG *kišrā* ([kis:r-á:]) (KBo 8.42 rev. 4; OS) vs. ACC.SG [*ki*]ššeran ([kis:é:ran]) (KBo 17.45: 5; OS).



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- How were instrumental case-forms with the archaic **C-initial ending** stressed within and across inflectional paradigms in Hittite?



Roadmap

- ▶ Introduction
- ▶ The vexed prosody of the instrumental case in Hittite
 - Empirical issues
 - Theoretical issues
 - Toward a new account
- ▶ Word stress in the instrumental case
- ▶ Analyzing word stress in the instrumental case
- ▶ Discussion & conclusions



Diagnosing stress (in the instrumental) and its limits

(3) Word stress in H *uttār/n*– ‘word’:

- | | | |
|---------------|----------------|-------------------------------|
| a. INS | <i>uddanda</i> | (e.g., KUB 30.10 obv. 19; MS) |
| b. NOM/ACC.SG | <i>uttar</i> | (e.g., KUB 37.223 b.5; OS) |
| c. NOM/ACC.PL | <i>uttār</i> | (ABoT 1.35 obv. 5; OS) |

- Prosody of C-initial instrumental forms in Hittite is poorly understood.
- Two main reasons:
 - (i) Stress patterns are often difficult to determine.
 - (ii) Traditional theories of IE nominal morphophonology do not make clear predictions about where stress is historically expected.



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- Prosody of C-initial instrumental forms in Hittite is poorly understood.
- Two main reasons:
 - (i) Stress patterns are often difficult to determine — consider, e.g., (3a).
 - (ii) Traditional theories of IE nominal morphophonology do not make clear predictions about where stress is historically expected.



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- Word stress in Hittite is not directly marked, must be **inferred** from its effects on vowel quantity and quality.
- Principal diagnostic of word stress is PLENE SPELLING ($\bar{V}$).¹
 - Plene spelling indicates a vowel is long.
 - Long vowels are generally stressed.

¹For details see Yates 2017: 72–101, forthcoming.



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⇒ Stressed stem-final long vowel in (3c).



Diagnosing stress (in the instrumental) and its limits

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| | ~ <i>uddar</i> | [ut:ár] (e.g., KUB 55.38 rev. iii 13; NS) |

- **But** — this diagnostic has well-established limitations:
 - Plene spelling is fundamentally optional, may be absent in individual attestations, e.g., (3c).



Diagnosing stress (in the instrumental) and its limits

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- **But** — this diagnostic has well-established limitations:
 - Plene spelling is fundamentally optional, may be absent in individual attestations, e.g., (3c).
 - Hittite has stressed short vowels in closed syllables, thus well-attested words that never exhibit plene spelling, e.g., (3b) (100+ occurrences).



Diagnosing stress (in the instrumental) and its limits

(3) Word stress in H *uttār/n*– ‘word’:

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| a. INS | <i>uddanda</i> | | (e.g., KUB 30.10 obv. 19; MS) |
| b. NOM/ACC.SG | <i>uttar</i> | [ú:ar] | (e.g., KUB 37.223 b.5; OS) |
| c. NOM/ACC.PL | <i>uttār</i> | [ut:ár] | (ABoT 1.35 obv. 5; OS) |
| | ~ <i>uddar</i> | [ut:ár] | (e.g., KUB 55.38 rev. iii 13; NS) |

- For well-attested words like (3b) the absence of plene spelling can be informative.
 - If stem-final syllable were stressed, it would be long as in (3c) and thus occasionally be spelled plene, contrary to fact.
 - Stem-initial vowel must be stressed, remains short in a closed syllable.



Diagnosing stress (in the instrumental) and its limits

(3) Word stress in H *uttār/n*– ‘word’:

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- But INS in (3a) never exhibits plene spelling and is not sufficiently attested (7×) for its absence to be probative (in a closed σ)



Diagnosing stress (in the instrumental) and its limits

(3) Word stress in H *uttār/n*– ‘word’:

a. INS	<i>uddanda</i>	[út:an-t]? or [ut:á(:)n-t]? (e.g., KUB 30.10 obv. 19; MS)
b. NOM/ACC.SG	<i>uttar</i>	[út:ar] (e.g., KUB 37.223 b.5; OS)
c. NOM/ACC.PL	<i>uttār</i>	[ut:ár] (ABoT 1.35 obv. 5; OS)
	~ <i>uddar</i>	[ut:ár] (e.g., KUB 55.38 rev. iii 13; NS)

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 - If stem-final syllable were stressed, it would be long as in (3c) and thus occasionally be spelled plene, contrary to fact.
 - Stem-initial vowel must be stressed, remains short in a closed syllable.
- But INS in (3a) never exhibits plene spelling and is not sufficiently attested (7×) for its absence to be probative (in a closed σ) — stress pattern thus remains unclear!



A case without a theory

(4) Word stress in H *kišš(e)r*– ‘hand’:

- | | | |
|---------------|------------------------------|----------------------------------|
| a. INS | <i>kiššarta</i> | (KBo 20.8 obv. 11; OS) |
| b. ACC.SG | <i>kiššeran</i> [kis:é:r-an] | (e.g., KBo 21.100 obv. 3; OH/MS) |
| c. DAT/LOC.SG | <i>kišrī</i> [kis:r-í:] | (e.g., HKM 44 rev. 10; MH/MS) |
| d. ALL.SG | <i>kišrā</i> [kis:r-á:] | (KBo 8.42 rev. 4; OS) |

- Traditional theories of IE nominal morphophonology do not make clear predictions about where stress is expected in C-initial INS forms — esp. in paradigms like (4a).
 - Stressed oblique case-forms are reconstructed whether “amphikinetic” (Schindler 1967b: 246–7) or “hysterodynamic” (Beekes 1985: 53–6).¹
 - INS in (4a) should in principle pattern prosodically with other oblique case-forms like (4c–d) — but there is no ending vowel to be stressed ([–t])!

¹Rieken (1999: 278–81) and Kloekhorst (2008: 471–2, 2013: 111–5, 2014: 46, 110 n. 367, 422–3, 447–8) provide detailed defenses of these respective reconstructions.



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| a. INS | <i>kiššarta</i> | | (KBo 20.8 obv. 11; OS) |
| b. ACC.SG | <i>kiššeran</i> | [kis:é:r-an] | (e.g., KBo 21.100 obv. 3; OH/MS) |
| c. DAT/LOC.SG | <i>kišrī</i> | [kis:r-í:] | (e.g., HKM 44 rev. 10; MH/MS) |
| d. ALL.SG | <i>kišrā</i> | [kis:r-á:] | (KBo 8.42 rev. 4; OS) |

- Stress pattern of INS in (4a) cannot be securely determined on purely empirical grounds.



A case without a theory

(4) Word stress in H *kišš(e)r*– ‘hand’:

a. INS	<i>kiššarta</i>	[kis:ár-t]?	(KBo 20.8 obv. 11; OS)
b. ACC.SG	<i>kiššeran</i>	[kis:é:r-an]	(e.g., KBo 21.100 obv. 3; OH/MS)
c. DAT/LOC.SG	<i>kišrī</i>	[kis:r-í:]	(e.g., HKM 44 rev. 10; MH/MS)
d. ALL.SG	<i>kišrā</i>	[kis:r-á:]	(KBo 8.42 rev. 4; OS)

- Stress pattern of INS in (4a) cannot be securely determined on purely empirical grounds.
 - Root *i*-vocalism is consistent with prehistoric stem-final stress (thus Kloekhorst 2014: 423).¹

¹Whether from **ġ^hs-ér-t* via epenthesis (Kloekhorst 2013: 114, 2014: 423) or from **ġ^hes-ér-t* via pretonic raising (cf. Schindler 1967b: 245, Rieken 1999: 280–1, i.a.).



A case without a theory

(4) Word stress in H *kišš(e)r*– ‘hand’:

a. INS *kiššarta* [kis:ár-t]? (KBo 20.8 obv. 11; OS)

b. ACC.SG *kiššeran* [kis:ér-an] (e.g., KBo 21.100 obv. 3; OH/MS)

c. DAT/LOC.SG *kišrī* [kis:r-í:] (e.g., HKM 44 rev. 10; MH/MS)

d. ALL.SG *kišrā* [kis:r-á:] (KBo 8.42 rev. 4; OS)

(3b) NOM/ACC.SG *uttar* [út:ar] (e.g., KUB 37.223 b.5; OS)

- Stress pattern of INS in (4a) cannot be securely determined on purely empirical grounds.
 - Root *i*-vocalism is consistent with prehistoric stem-final stress (thus Kloekhorst 2014: 423).
 - But recall (3b) — stress on prehistoric zero-grade root shows purely historical diagnostics are not always reliable.



Reevaluating the instrumental case

- | | | | | |
|-----|----|------------------|----------------|---------------------------------------|
| (5) | a. | <i>išhanda</i> | ‘with blood’ | (KBo 17.4 iii 15; OS) |
| | b. | <i>sakanda</i> | ‘with oil’ | (e.g., KBo 22.2 obv. 2; OS) |
| | c. | <i>zahhait</i> | ‘by battle’ | (KUB 11.1 iv 10; OH/MS ²) |
| | d. | <i>išhimanda</i> | ‘with bonds’ | (KUB 17.6 i 11; OH/NS) |
| | e. | <i>ganut</i> | ‘by the knees’ | (KUB 12.63 obv. 26; OH/MS) |

⇒ The prosody of C-initial INS forms calls for a reevaluation — two goals:



Reevaluating the instrumental case

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| | c. | <i>zahhait</i> | ‘by battle’ | (KUB 11.1 iv 10; OH/MS [?]) |
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⇒ The prosody of C-initial INS forms calls for a reevaluation — two goals:

(i) Reassess the (limited!) synchronic evidence for stress in INS and associated paradigms.

★ INS exhibits stem-final stress across diverse prosodic types in (5).



Reevaluating the instrumental case

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⇒ The prosody of C-initial INS forms calls for a reevaluation — two goals:

(i) Reassess the (limited!) synchronic evidence for stress in INS and associated paradigms.

★ INS exhibits stem-final stress across diverse prosodic types in (5).

(ii) Propose a new (compositional) analysis that accounts for these inflectional stress patterns.

★ PREACCENTING INS /'-t/ and Kiparsky & Halle's (1977) BASIC ACCENTUATION PRINCIPLE.



Reevaluating the instrumental case

- (5)
- | | | | |
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- How does the Hittite instrumental impact the reconstruction of PIE word prosody?



Roadmap

- ▶ Introduction
- ▶ The vexed prosody of the instrumental case in Hittite
- ▶ Word stress in the instrumental case
 - Instrumental of nominals with edgewise mobility
 - Instrumental of nominals with shifting mobility
 - Instrumental of 'knee'
- ▶ Analyzing word stress in the instrumental case
- ▶ Discussion & conclusions



Edgewise mobility & the instrumental of 'blood'

(6) Word stress in H *ěšh(a)r/n*– 'blood':

- | | | |
|---------------|-----------------------------|--------------------------------------|
| a. INS | <i>išhanda</i> | (KBo 17.4 rev. iii 15; OS) |
| b. NOM/ACC.SG | <i>ěšhar</i> [é:sχ:-ar] | (e.g., KUB 36.100 obv. 23; OS) |
| c. GEN.SG | <i>išhanāš</i> [isχ:-n-á:s] | (e.g., KBo 17.1 iv 8; OS) |
| d. DAT/LOC.SG | <i>išhanī</i> [isχ:-n-í:] | (e.g., KBo 15.33 rev. iii 31; OH/MS) |

- (6) exhibits EDGEWISE MOBILITY (“amphikinetic”) — stress alternates between:
 - Stem-initial syllable in (6b) direct cases, thus spelled plene.
 - Inflectional endings in (6c–d) oblique cases, thus spelled plene.



Edgewise mobility & the instrumental of 'blood'

(6) Word stress in H *ěšh(a)r/n-* 'blood':

- | | | | |
|---------------|------------------------------|--------------|--------------------------------------|
| a. INS | <i><u>iš</u>hand<u>a</u></i> | [isχ:-án-t] | (KBo 17.4 rev. iii 15; OS) |
| b. NOM/ACC.SG | <i>ēšhar</i> | [é:sχ:-ar] | (e.g., KUB 36.100 obv. 23; OS) |
| c. GEN.SG | <i>išhanāš</i> | [isχ:-n-á:s] | (e.g., KBo 17.1 iv 8; OS) |
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- (6) exhibits EDGEWISE MOBILITY (“amphikinetic”) — stress alternates between:
 - Stem-initial syllable in (6b) direct cases, thus spelled plene.
 - Inflectional endings in (6c–d) oblique cases, thus spelled plene.

⇒ Stem-final stress in INS in (6a) is supported by root allomorphy.

- Same root *i*-vocalism in (6a) as in clearly pretonic (6c–d) oblique cases.



Edgewise mobility & the instrumental of 'oil'

(7) Word stress in H šāk(a)n– 'oil, fat':

- | | | |
|---------------|-------------------|------------------------------|
| a. INS | šakanda | (e.g., KBo 22.2 obv. 2; OS) |
| b. NOM/ACC.SG | šākan [sá:kan] | (KBo 40.69:5; NS) |
| c. GEN.SG | šaknāš [sakn-á:s] | (e.g., KBo 20.33 obv. 7; OS) |

- (7) likewise exhibits EDGEWISE MOBILITY — stress alternates between:
 - Stem-initial syllable in (7b) direct cases, thus spelled plene.
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| b. NOM/ACC.SG | šākan | [sá:kan] | (KBo 40.69:5; NS) |
| c. GEN.SG | <u>šaknāš</u> | [sakn-á:s] | (e.g., KBo 20.33 obv. 7; OS) |

• (7) likewise exhibits EDGEWISE MOBILITY — stress alternates between:

- Stem-initial syllable in (7b) direct cases, thus spelled plene.
- Inflectional endings in (7c) oblique cases, thus spelled plene.

⇒ Stem-final stress in INS in (7a) is suggested by lack of stem-initial plene.

- Matches ending-stressed (7c) oblique case, where stem-initial plene is predictably lacking.
- But accidental absence of stem-initial plene cannot be excluded (3× in an open σ).



Shifting mobility & the instrumental of 'battle'

(8) Word stress in H *zahh(ă)i*– 'battle':

- | | | |
|-----------|-------------------------------|----------------------------------|
| a. INS | <i>zahhait</i> | (KUB 11.1 iv 10; OH/MS?) |
| b. ACC.SG | <i>zahhāin</i> [tsax:-āi:-n] | (KUB 33.97 i 12; NS) |
| c. GEN.SG | <i>zahhiyas</i> [tsax:-j-ā:s] | (e.g., KUB 23.72 rev. 50; MH/MS) |

- (8) exhibits SHIFTING MOBILITY ("hysterokinetic") — stress alternates between:
 - Stem-final syllable in (8b) direct cases, thus spelled plene.
 - Inflectional endings in (8c) oblique cases, thus triggering pretonic deletion in stem-final σ



Shifting mobility & the instrumental of 'battle'

(8) Word stress in H *zahh(ă)i*– 'battle':

- | | | | |
|-----------|--------------------------------|-----------------------|---------------------------------------|
| a. INS | <i>zahh</i> <u><i>ait</i></u> | [tsax:- <u>ái</u> -t] | (KUB 11.1 iv 10; OH/MS [?]) |
| b. ACC.SG | <i>zahh</i> <u><i>āin</i></u> | [tsax:- <u>ái</u> -n] | (KUB 33.97 i 12; NS) |
| c. GEN.SG | <i>zahh</i> <u><i>iyas</i></u> | [tsax:-j- <u>ás</u>] | (e.g., KUB 23.72 rev. 50; MH/MS) |

- (8) exhibits SHIFTING MOBILITY (“hysterokinetic”) — stress alternates between:
 - Stem-final syllable in (8b) direct cases, thus spelled plene.
 - Inflectional endings in (8c) oblique cases, thus triggering pretonic deletion in stem-final σ

⇒ Stem-final stress in INS in (8a) is supported by root and suffix allomorphy.

- Same suffix shape in (8a) as in suffix-stressed (8b) direct cases.¹

¹Formation from innovative oblique stem with generalized [-ái-] (Zucha 1988: 304, Frantíková 2023: 35) is unlikely on chronological grounds.



Shifting mobility & the instrumental of 'battle'

(8) Word stress in H *zahh(ă)i*– 'battle':

a. INS *zahhait* [tsaχ:-ai-t] (KUB 11.1 iv 10; OH/MS?)

b. ACC.SG *zahhāin* [tsaχ:-ai-n] (KUB 33.97 i 12; NS)

c. GEN.SG *zahhiyas* [tsaχ:-j-as] (e.g., KUB 23.72 rev. 50; MH/MS)

(9) 3SG.NPST.ACT *zāhi* [tsá:χ-i] 'strikes' (e.g., KUB 8.34 ii 9; OH/MS?)

- (8) exhibits SHIFTING MOBILITY ("hysterokinetic") — stress alternates between:
 - Stem-final syllable in (8b) direct cases, thus spelled plene.
 - Inflectional endings in (8c) oblique cases, thus triggering pretonic deletion in stem-final σ

⇒ Stem-final stress in INS in (8a) is supported by root and suffix allomorphy.

- Same suffix shape in (8a) as in suffix-stressed (8b) direct cases.
- Same root shape and lack of plene in (8a) as in pretonic (8b–c), contrasting with stressed (9).



Shifting mobility & the instrumental of 'bond'

(10) Word stress in H *išhimān*– 'bond, cord':

- | | | | |
|-----------|------------------|-----------------|-------------------------|
| a. INS | <i>išhimanta</i> | | (KUB 17.6 i 11; OH/NS) |
| b. NOM.PL | <i>išhimāneš</i> | [isχi-má:n-es]) | (KBo 17.15 rev. 10; OS) |
| c. ABL | <i>išhimanaz</i> | [isχi-mn-á:fs]? | (KUB 36.55 ii 16; MS) |

(11) INS.SG Ved. *mahinā́* 'with greatness' (e.g., RV VI.8.2)

- (10) potentially exhibits SHIFTING MOBILITY:
 - Stem-final syllable is stressed in (10b) direct cases, thus spelled plene.
 - Oblique cases are poorly attested — (10c) **could** have the **ending stress** and **pretonic deletion** expected on comparative-historical grounds, e.g., in INS of Ved. *mahimán*– in (11).¹

¹On the oblique cases of PIE *-mon-stems see Yates 2022a: 264–6.



Shifting mobility & the instrumental of 'bond'

(10) Word stress in H *išhimān*– 'bond, cord':

- | | | | |
|-----------|-------------------------|-----------------------------|-------------------------|
| a. INS | <i>išhim<u>anta</u></i> | [isχi-má(:)n-t] | (KUB 17.6 i 11; OH/NS) |
| b. NOM.PL | <i>išhimā<u>neš</u></i> | [isχi-má:n-es] | (KBo 17.15 rev. 10; OS) |
| c. ABL | <i>išhim<u>an</u>az</i> | [isχi-mn-á:fs] [?] | (KUB 36.55 ii 16; MS) |

(12) 3SG.NPST.ACT *išhāi* [isχá:i] 'binds' (e.g., KUB 29.30 ii 16; OS)

• (10) potentially exhibits SHIFTING MOBILITY:

- Stem-final syllable is stressed in (10b) direct cases, thus spelled plene.
- Oblique cases are poorly attested — (10c) **could** have the ending stress and pretonic deletion expected on comparative-historical grounds, e.g., in INS of Ved. *mahimán*– in (11).

⇒ Stem-final stress in INS in (10a) is evident from verbal root allomorphy.

- Same root shape in (10a) as in clearly pretonic (10b), contrasting with (12) stressed contexts.



The instrumental of 'knee'

(13) Word stress in H *g(ě)nu*– 'knee':

- | | | | |
|---------------|----------------|------------|-----------------------------|
| a. INS | <i>ganut</i> | | (KUB 12.63 obv. 26; OH/MS) |
| b. NOM/ACC.SG | <i>gēnu</i> | [ké:nu] | (e.g., KBo 10.37 ii 33; NS) |
| c. DAT/LOC.PL | <i>gēnuwaš</i> | [ké:nw-as] | (e.g., KBo 5.1 iv 11; NS) |

- (13) clearly exhibits fixed stem-initial stress (“acrostatic”) outside the INS:
 - Initial stress in (13b) direct case-forms, thus spelled plene.
 - Initial stress in (13c) oblique case-forms, thus spelled plene.



The instrumental of ‘knee’

(13) Word stress in H *g(ě)nu*– ‘knee’:

- | | | | |
|---------------|-----------------------|---------------------|-----------------------------|
| a. INS | <i><u>gan</u>ut</i> | [<u>knú</u> -t] | (KUB 12.63 obv. 26; OH/MS) |
| b. NOM/ACC.SG | <i><u>gē</u>nu</i> | [<u>ké</u> :nu] | (e.g., KBo 10.37 ii 33; NS) |
| c. DAT/LOC.PL | <i><u>gē</u>nuwaš</i> | [<u>ké</u> :nw-as] | (e.g., KBo 5.1 iv 11; NS) |

• (13) clearly exhibits fixed stem-initial stress (“acrostatic”) outside the INS:

- Initial stress in (13b) direct case-forms, thus spelled plene.
- Initial stress in (13c) oblique case-forms, thus spelled plene.

⇒ Stem-final stress is widely assumed in (13a).¹

- Interpreted as an archaism with pretonic deletion in stem-final syllable, hence divergent spelling ⟨*ga*⟩ (with “empty” vowel) vs. ⟨*ge*⟩ in (13b–c).

¹See Schindler 1967a: 203 n. 90, Kloekhorst 2008: 467–8, 2014: 494–6, i.a. (cf. Neu 1972: 293–5).



The instrumental of ‘knee’

(13) Word stress in H *g(ě)nu*– ‘knee’:

- | | | | |
|---------------|-----------------------|---------------------|-----------------------------|
| a. INS | <i><u>ganut</u></i> | [<u>knú</u> -t] | (KUB 12.63 obv. 26; OH/MS) |
| b. NOM/ACC.SG | <i><u>gēnu</u></i> | [<u>ké</u> :nu] | (e.g., KBo 10.37 ii 33; NS) |
| c. DAT/LOC.PL | <i><u>gēnuwaš</u></i> | [<u>ké</u> :nw-as] | (e.g., KBo 5.1 iv 11; NS) |

• (13) clearly exhibits fixed stem-initial stress (“acrostatic”) outside the INS:

- Initial stress in (13b) direct case-forms, thus spelled plene.
- Initial stress in (13c) oblique case-forms, thus spelled plene.

⇒ Stem-final stress is widely assumed in (13a).

- Interpreted as an archaism with pretonic deletion in stem-final syllable, hence divergent spelling ⟨*ga*⟩ (with “empty” vowel) vs. ⟨*ge*⟩ in (13b–c).
- Competes with *genut* (e.g., KUB 58.111 obv. 5; OH/NS) with non-deletion and (likely) stem-initial stress ([ké:nu-t]).²

²Possibly already in OH — Neu (1972) reads ⟨[g]e-¹nu¹-t=a-at=kán⟩ in KBo 17.17 rev.¹ 12 (OS), but Kloekhorst (2014: 495) argues for ⟨[g]a-⁰⟩.



Summary: stress patterns in the instrumental case

- (14) a. *išhanda* [isχi:-án-t] ‘with blood’ (KBo 17.4 iii 15; OS)
b. *sakanda* [sakán-t] ‘with oil’ (e.g., KBo 22.2 obv. 2; OS)
c. *zahhait* [ʔsaxi:-ái:-t] ‘by battle’ (KUB 11.1 iv 10; OH/MS?)
d. *išhimanda* [isχi-má(:)-t] ‘with bonds’ (KUB 17.6 i 11; OH/NS)
e. *ganut* [knú-t] ‘by the knees’ (KUB 12.63 obv. 26; OH/MS)

- C-initial INS forms exhibit stem-final stress across prosodically diverse inflectional types.
 - In (14a–b) nominals with edgewise mobility, diverging from direct and oblique cases.
 - In (14c–d) nominals with shifting mobility, matching direct against oblique case-forms.
 - In (14e) with fixed stem-initial stress, diverging from direct and oblique cases.



Summary: stress patterns in the instrumental case

- (14)
- | | | | | |
|----|-------------------------|--------------------------|----------------|-----------------------------|
| a. | <i>iš<u>handa</u></i> | [isχi:- <u>án</u> -t] | ‘with blood’ | (KBo 17.4 iii 15; OS) |
| b. | <i>sak<u>anda</u></i> | [sak <u>án</u> -t] | ‘with oil’ | (e.g., KBo 22.2 obv. 2; OS) |
| c. | <i>zakh<u>ait</u></i> | [tsaxi:- <u>ái</u> :-t] | ‘by battle’ | (KUB 11.1 iv 10; OH/MS?) |
| d. | <i>iš<u>himanda</u></i> | [isχi-má(:) <u>n</u> -t] | ‘with bonds’ | (KUB 17.6 i 11; OH/NS) |
| e. | <i>gan<u>ut</u></i> | [knú-t] | ‘by the knees’ | (KUB 12.63 obv. 26; OH/MS) |

- C-initial INS forms exhibit stem-final stress across prosodically diverse inflectional types.
- Traditional theories of IE nominal morphophonology might conclude the Hittite INS is “exceptional” (like the PIE “endingless locative”).



Summary: stress patterns in the instrumental case

- (14) a. *išhanda* [isχi:-án-t] ‘with blood’ (KBo 17.4 iii 15; OS)
- b. *sakanda* [sakán-t] ‘with oil’ (e.g., KBo 22.2 obv. 2; OS)
- c. *zaḫhait* [ṣaxi:-ái:-t] ‘by battle’ (KUB 11.1 iv 10; OH/MS?)
- d. *išhimanda* [isχi-má(:)-t] ‘with bonds’ (KUB 17.6 i 11; OH/NS)
- e. *ganut* [knú-t] ‘by the knees’ (KUB 12.63 obv. 26; OH/MS)

- C-initial INS forms exhibit stem-final stress across prosodically diverse inflectional types.
- ✗ Traditional theories of IE nominal morphophonology might conclude the Hittite INS is “exceptional” (like the PIE “endingless locative”).
- ★ Distribution of stress in Hittite INS is **principled**, consistent with established properties of its synchronic prosodic system (like the PIE “endingless locative;” see Yates 2023).



Roadmap

- ▶ Introduction
- ▶ The vexed prosody of the instrumental case in Hittite
- ▶ Word stress in the instrumental case
- ▶ Analyzing word stress in the instrumental case
 - Components of the analysis
 - Analyzing the instrumental in nominals with edgewise mobility
 - Analyzing the instrumental in nominals with shifting mobility
 - Analyzing the instrumental of 'knee'
- ▶ Discussion & conclusions



Components of the analysis

(15) **BASIC ACCENTUATION PRINCIPLE (BAP)** (cf. Kiparsky & Halle 1977):

If a word has more than one accented vowel, word stress is assigned to the leftmost. If a word has no accented vowel, word stress is assigned to the leftmost syllable.

- Prosody of *C*-initial instrumental forms falls out from two core assumptions:
 - (i) BAP in (15) is synchronically operative in Hittite, governs inflectional stress assignment.¹

¹See Yates 2015, 2017, et seq.



Components of the analysis

(15) **BASIC ACCENTUATION PRINCIPLE (BAP)** (cf. Kiparsky & Halle 1977):

If a word has more than one accented vowel, word stress is assigned to the leftmost. If a word has no accented vowel, word stress is assigned to the leftmost syllable.

(16) INS $\Leftrightarrow$ /'-t/

- Prosody of C-initial instrumental forms falls out from two core assumptions:
 - (i) BAP in (15) is synchronically operative in Hittite, governs inflectional stress assignment.
 - (ii) INS ending is lexically PREACCENTING, i.e., prefers stress to surface on preceding σ .



Edgewise mobility & the instrumental case: analysis

(17) Stress assignment in H *sāk(a)n*– ‘oil, fat’:

- a. NOM/ACC.SG /sakan-∅/ → [sá:kan] (*šākan*)
b. GEN.SG /sakan-á:s/ → [sakn-á:s] (*šaknāš*)
c. INS /sakan-’t/ → [sakán-t] (*šakanda*)

- Nominals with edgewise mobility have lexically UNACCENTED (i.e., stress-neutral) stems.
- Stress assignment emerges straightforwardly via BAP:
 - No accented morphemes in (17a), thus stress assigned to word-initial σ by default.
 - V-initial oblique ending is lexically ACCENTED (i.e., stress-preferring), attracts stress in (17b).
 - INS ending /’-t/ is PREACCENTING, attracts stress to stem-final σ in (17c).



Shifting mobility & the instrumental case: analysis

(18) Stress assignment in H *zahh(ă)i-* ‘battle’:

- a. ACC.SG /t͡saχʰ:-á:i-n/ → [t͡saχʰ:-á:i-n] (*zahhāin*)
- b. GEN.SG /t͡saχʰ:-á:i-á:s/ → [t͡saχʰ:-j-á:s] (*zahhīyaš*)
- c. INS /t͡saχʰ:-á:i-’t/ → [t͡saχʰ:-á:i-t] (*zahhait*)

- Nominals with edgewise mobility have stems accented on stem-final syllable.
- Stress assignment in (18a) direct cases and (18c) INS emerge straightforwardly via BAP:
 - In (18a) stem-final accent attracts stress to stem-final σ (hence non-default stress).
 - In (18c) stem-final accent and preaccenting /’-t/ **both attract stress to stem-final σ** .



Shifting mobility & the instrumental case: analysis

(18) Stress assignment in H *zahh(ă)i-* ‘battle’:

a. ACC.SG /t͡saχʰ:-á:i-n/ → [t͡saχʰ:-á:i-n] (*zahhāin*)

b. GEN.SG /t͡saχʰ:-á:i-á:s/ → [t͡saχʰ:-j-á:s] (*zahhīyaš*)

c. INS /t͡saχʰ:-á:i-’t/ → [t͡saχʰ:-á:i-t] (*zahhait*)

(19) **SECONDARY MOBILITY (2^{RY}M):**

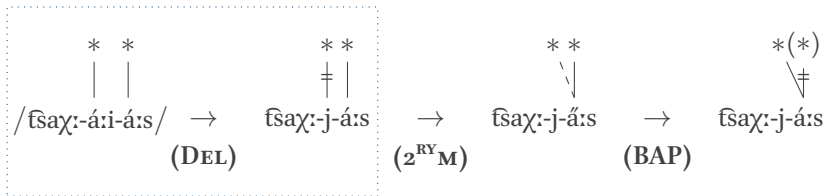
When a syllable is eliminated, its accent shifts to the next syllable.”

- Nominals with edgewise mobility have stems accented on stem-final syllable.
- Stress assignment in (18a) direct cases and (18c) INS emerge straightforwardly via BAP.
- Kiparsky (2010) attributes **ending stress** in (18b) to SECONDARY MOBILITY in (19).



Shifting mobility as “secondary mobility”

(20) Stress assignment in GEN.SG *zahhiyaš* ([t̪saχʰi-j-á:s]) ‘of battle’:

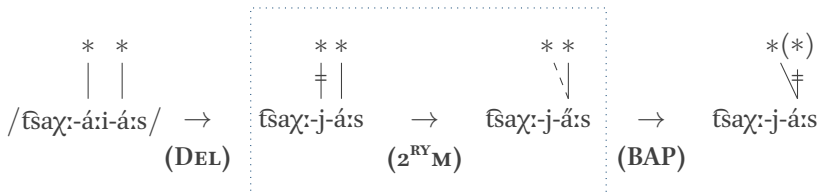


STEP 1: Accented oblique ending induces deletion of /á:/ in stem-final σ .



Shifting mobility as “secondary mobility”

(20) Stress assignment in GEN.SG *zahhiyaš* ([t̪saχʰː-j-áːs]) ‘of battle’:

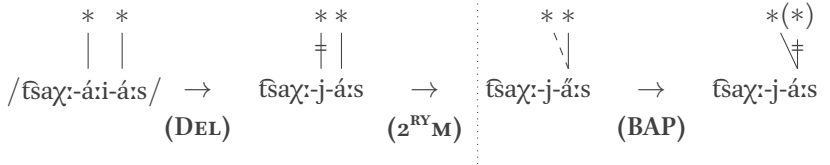


STEP 2: Floating stem-final accent reassociates rightward via 2^{RY}M.



Shifting mobility as “secondary mobility”

(20) Stress assignment in GEN.SG *zahhiyaš* ([t̪saχʰ-j-á:s]) ‘of battle’:



STEP 3: One accent deleted and other assigned stress via BAP.



'knee' and the instrumental case: analysis

(21) Stress assignment in H $g(\check{e})nu$ – 'knee':

- a. NOM/ACC.SG /ké:nu-∅/ → [ké:nu] (*gēnu*)
b. DAT/LOC.PL /ké:nu-á:s/ → [ké:nw-as] (*gēnuwaš*)
c. INS /ké:nu-ʻt/ → [knú-t] (*ganut*)

- 'knee' has a stem-initial lexical accent
- Stress assignment in (21a) direct and (21b) oblique cases emerge straightforwardly via BAP:
 - Accented stem-initial $\acute{o}$ attracts stress in (21a).
 - In (21b) deletion in stem-initial $\acute{o}$ is phonotactically excluded ($^x\#\text{knw-}$); it thus receives stress as the leftmost accented syllable.



'knee' and the instrumental case: analysis

(21) Stress assignment in H $g(\check{e})nu$ – 'knee':

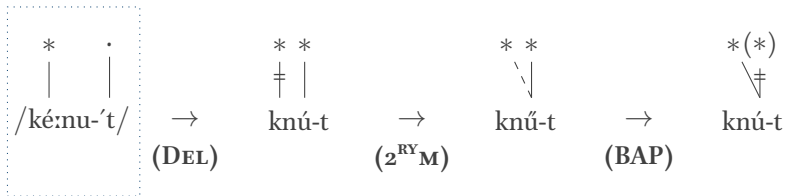
- a. NOM/ACC.SG /ké:nu-∅/ → [ké:nu] (*gēnu*)
b. DAT/LOC.PL /ké:nu-á:s/ → [ké:nw-as] (*gēnuwaš*)
c. INS /ké:nu-'t/ → [knú-t] (*ganut*)

- 'knee' has a stem-initial lexical accent
- Stress assignment in (21a) direct and (21b) oblique cases emerge straightforwardly via BAP:
 - Accented stem-initial $\acute{o}$ attracts stress in (21a).
 - In (21b) deletion in stem-initial $\acute{o}$ is phonotactically excluded ($^x\#knw-$); it thus receives stress as the leftmost accented syllable.
- INS in (21c) receives stem-final stress due to SECONDARY MOBILITY.



“Secondary mobility” and the instrumental of ‘knee’

(22) Stress assignment in INS *ganut* ([kn-út]) ‘by the knees’:

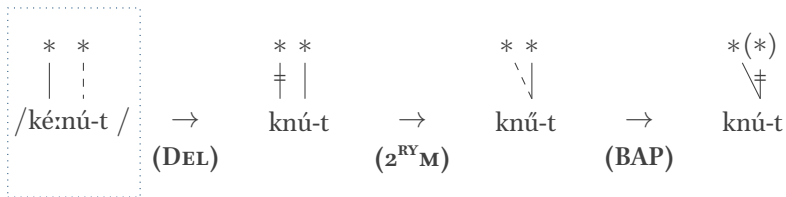


STEP 0: Preaccenting ending places an accent on stem-final σ



“Secondary mobility” and the instrumental of ‘knee’

(22) Stress assignment in INS *ganut* ([kn-út]) ‘by the knees’:

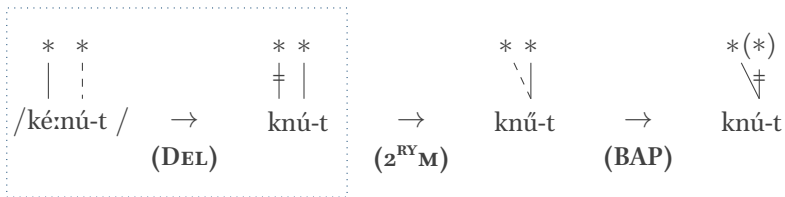


STEP 0: Preaccenting ending places an accent on stem-final σ



“Secondary mobility” and the instrumental of ‘knee’

(22) Stress assignment in INS *ganut* ([kn-út]) ‘by the knees’:

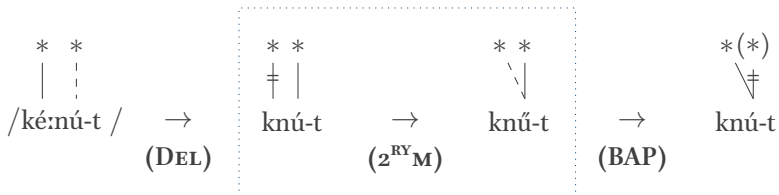


STEP 1: Accented stem-final $\acute{o}$ induces deletion of / $\acute{e}:/$ in stem-initial $\acute{o}$.



“Secondary mobility” and the instrumental of ‘knee’

(22) Stress assignment in INS *ganut* ([kn-út]) ‘by the knees’:

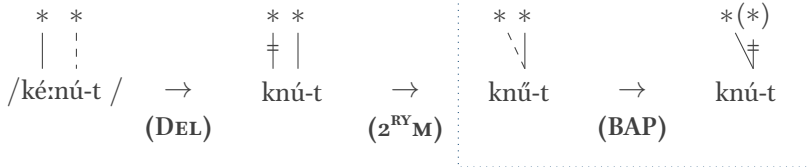


STEP 2: Floating stem-initial accent reassociates rightward via 2^{RY}M.



“Secondary mobility” and the instrumental of ‘knee’

(22) Stress assignment in INS *ganut* ([kn-út]) ‘by the knees’:



STEP 3: One accent deleted and other assigned stress via BAP.



'knee' and the instrumental case: analysis

(21) Stress assignment in H *gēnu*– 'knee':

- a. NOM/ACC.SG /ké:nu-∅/ → [ké:nu] (*gēnu*)
- b. DAT/LOC.PL /ké:nu-ás/ → [ké:nw-as] (*gēnuwaš*)
- c. INS /ké:nu-ʔt/ → [knú-t] (*ganut*)

• Upshots of this analysis:

- Correctly predicts non-plene spelling in INS in (21c), unlike a “secondary proterokinetic” or “proterodynamic” reconstruction **ĝn-éu-t* (> ^x[ú:]).¹

¹Thus respectively Schindler (1975: 7) and Kloekhorst (2014: 495–6); the latter argues it has analogical [u] from (21a).



'knee' and the instrumental case: analysis

(21) Stress assignment in H *gēnu*– 'knee':

- a. NOM/ACC.SG /ké:nu-∅/ → [ké:nu] (*gēnu*)
- b. DAT/LOC.PL /ké:nu-ás/ → [ké:nw-as] (*gēnuwaš*)
- c. INS /ké:nu-'t/ → [knú-t] (*ganut*)
- d. INS /ké:nu-'t/ → [ké:nu-t] (*genut*)

- Upshots of this analysis:

- Correctly predicts non-plene spelling in INS in (21c), unlike a “secondary proterokinetic” or “proterodynamic” reconstruction **ġn-éu-t* (> ^x[ú:]).
- Correctly predicts the renewed INS in (22d) when deletion in stem-initial *ó* is no longer possible, leftmost accented wins via BAP like in (21b).²

²For an emergent constraint in Anatolian against intraparadigmatic variation in word-initial onsets see Yates 2021a.



Roadmap

- ▶ Introduction
- ▶ The vexed prosody of the instrumental case in Hittite
- ▶ Word stress in the instrumental case
- ▶ Analyzing word stress in the instrumental case
- ▶ Discussion & conclusions
 - Implications for PIE prosody
 - A new reconstruction of PIE 'knee'



Implications for reconstructing PIE word prosody

(23) Stress assignment in Hittite instrumental forms:

- a. /e:sχ:-an-ʻt/ → [isχ:-án-t] (*išḫanda*) ‘with blood’
- b. /sakan-ʻt/ → [sakán-t] (*šakanda*) ‘with oil’
- c. /ṭsaχ:-á:i-ʻt/ → [ṭsaχ:-á:i-t] (*zaḫḫait*) ‘by battle’
- d. /sχi-má:n-ʻt/ → [isχi-má:n-t] (*išḫimanda*) ‘with bonds’
- e. /gé:nu-ʻt/ → [knú-t] (*ganut*) ‘by the knees’

- Some general implications of this analysis for PIE prosody:
 - Distribution of word stress in Hittite instrumental forms is consistent with the BAP, adding further evidence for its operation in PIE.



Implications for reconstructing PIE word prosody

(23) Stress assignment in Hittite instrumental forms:

- a. /e:sχ:-an-ʼt/ → [isχ:-án-t] (*išḫanda*) ‘with blood’
- b. /sakan-ʼt/ → [sakán-t] (*šakanda*) ‘with oil’
- c. /ṭsaχ:-á:i-ʼt/ → [ṭsaχ:-á:i-t] (*zaḫḫait*) ‘by battle’
- d. /sχi-má:n-ʼt/ → [isχi-má:n-t] (*išḫimanda*) ‘with bonds’
- e. /gé:nu-ʼt/ → [knú-t] (*ganut*) ‘by the knees’

- Some general implications of this analysis for PIE prosody:
 - Distribution of word stress in Hittite instrumental forms is consistent with the BAP, adding further evidence for its operation in PIE.
 - Supports PIE preaccenting endings



Implications for reconstructing PIE word prosody

(24) Stress assignment in H *tēkan/takn*– ‘earth’:

a. NOM/ACC.SG /tekan-∅/ → [tēkan] (*tēkan*) (e.g., KBo 17.3 ii 15; OS)

b. GEN.SG /tekan-á:s/ → [takn-á:s] (*taknāš*) (e.g., IBoT 3.141 iv 10; OH/MS)

c. LOC /tekan-’∅/ → [takán] (*takān*) (e.g., KBo 25.61 ii 16; OS)

(17c) INS /sakan-’t/ → [sakán-t] (*šakanda*) (e.g., KBo 22.2 obv. 2; OS)

- Some general implications of this analysis for PIE prosody:

- Distribution of word stress in Hittite instrumental forms is consistent with the BAP, adding further evidence for its operation in PIE.
- Supports PIE preaccenting endings — in particular, “endingless locative” */-’∅/ (Yates 2023).¹
 - Patterns prosodically with INS in Hittite, e.g., (24c) like (17c).
 - Structurally parallel to INS, i.e., oblique case ending with no vocalic nucleus.

¹Likewise NOM/ACC.PL.N */-h₂/ (Yates 2021b, 2021c, 2022: 286 n. 25) — e.g., H *uttār* ‘words’ ([ut:ár]) in (3c).



A new reconstruction of PIE ‘knee’

(25) Stress assignment in PIE $*\hat{g}(\acute{o}/\acute{e})nu-$ ‘knee’:

- a. NOM/ACC.SG $*/\hat{g}ónu/ \rightarrow *[\hat{g}ónu]$ > Ved. *jánu*, AGk. *gónu* (e.g., RV X.15.6; *Il.* 11.547)
- b. DAT.PL $*/\hat{g}énu-ós/ \rightarrow *[\hat{g}énw-os]$ > H *gēnuwaš* (e.g., KBo 5.1 iv 11; NS)
- c. LOC $*/\hat{g}énu-’\emptyset/ \rightarrow *[\hat{g}nú]$ >> AGk. *gnúsi* (*h.Herm* 152)

- **Proposal:** Stressed $*[\acute{o}/\acute{e}]$ in stem-initial $\acute{\sigma}$ as per traditional “acrostatic II” reconstruction — but stem-final stress in “endingless locative.”¹

¹For the standard “acrostatic I” reconstruction see Schindler 1975: 7 (cf. Fortson 2010: 120, Beekes & de Vaan 2011: 208, Ringe 2017: 58, i.a.).



A new reconstruction of PIE ‘knee’

(25) Stress assignment in PIE $*\hat{g}(\acute{o}/\acute{e})nu-$ ‘knee’:

a. NOM/ACC.SG $*/\hat{g}ónu/ \rightarrow *[\hat{g}ónu] > \text{Ved. } j\acute{a}nu, \text{AGk. } gónu$ (e.g., RV X.15.6; *Il.* 11.547)

b. DAT.PL $*/\hat{g}énu-ós/ \rightarrow *[\hat{g}énw-os] > \text{H } gēnuwaš$ (e.g., KBo 5.1 iv 11; NS)

c. LOC $*/\hat{g}énu-’\varnothing/ \rightarrow *[\hat{g}nú] >> \text{AGk. } gnúsi$ (*h.Herm* 152)

(21c) INS H $/ké:nu-’t/ \rightarrow [knú-t]$ (*ganut*)

- **Proposal:** Stressed $*[\acute{o}/\acute{e}]$ in stem-initial $\acute{\sigma}$ as per traditional “acrostatic II” reconstruction — but stem-final stress in “endingless locative.”
- Predicts contrast between (25c) endingless locative and (25b) oblique case-forms with $\acute{V}$ -initial endings, exactly parallel to Hittite INS in (21c) vs. oblique.
 - Stem-final stress in (25c) – deletion eliminates stem-initial $\acute{\sigma}$, licenses SECONDARY MOBILITY.
 - Stem-initial stress in (25b) — deletion + SECONDARY MOBILITY is phonotactically blocked ($^x\#\hat{g}nw-’$); deletion + $/n/$ -vocalization wouldn’t license SECONDARY MOBILITY ($^x\#\hat{g}ñw-$).²

²See Yates 2019 for an OT analysis that predicts (25b) in PIE (cf. Yates 2020), viz., prior to the emergence of Kiparsky’s (2010; 2018) ZERO-GRADE RULE.



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(25) Stress assignment in PIE $*\hat{g}(\acute{o}/\acute{e})nu-$ ‘knee’:

- a. NOM/ACC.SG $*/\hat{g}ónu/ \rightarrow *[\hat{g}ónu]$ > Ved. *jánu*, AGk. *gónu* (e.g., RV X.15.6; *Il.* 11.547)
- b. DAT.PL $*/\hat{g}énu-ós/ \rightarrow *[\hat{g}énw-os]$ > H *gēnuwaš* (e.g., KBo 5.1 iv 11; NS)
- c. LOC $*/\hat{g}énu-’\emptyset/ \rightarrow *[\hat{g}nú]$ >> AGk. *gnúsi* (*h.Herm* 152)
 >> Goth. *kniu*, ON *kné*, OE *cnēo* ‘knee’

- **Proposal:** Stressed $*[\acute{o}/\acute{e}]$ in stem-initial $\acute{\sigma}$ as per traditional “acrostatic II” reconstruction — but stem-final stress in “endingless locative.”
- Plausible empirical support for endingless locative in (25c):
 - Continued in AGk. *gnúsi* ‘(around his) knees’ with post-PIE accretion of postposition and integration into case system.
 - Structurally parallel Indo-Iranian forms show same development, e.g., Ved. *snúṣu*, *snúbhis* ‘on/along (their) backs’.



A new reconstruction of PIE ‘knee’

(25) Stress assignment in PIE $*\hat{g}(\acute{o}/\acute{e})nu-$ ‘knee’:

- a. NOM/ACC.SG $*/\hat{g}ónu/ \rightarrow *[\hat{g}ónu]$ > Ved. *jánu*, AGk. *gónu* (e.g., RV X.15.6; *Il.* II.547)
- b. DAT.PL $*/\hat{g}énu-ós/ \rightarrow *[\hat{g}énw-os]$ > H *gēnuwaš* (e.g., KBo 5.1 iv 11; NS)
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- Plausible empirical support for endingless locative in (25c):
 - Continued in AGk. *gnúsi* ‘(around his) knees’ with post-PIE accretion of postposition and integration into case system.
 - Provides analogical pivot for “secondary proterokinetic” forms ($[\hat{*}\hat{g}n-éu-]$), e.g., in Germanic, likely analogical to $*u$ -stems with suffixal ablaut.¹

¹Likewise, e.g., LOC PIE $*[\acute{d}rú]$ ‘in the tree’ >> GEN.SG Ved. *drós*, YAv. *draoš*.



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