Hittite and the Indo-European Accent: A conversation with Alwin Kloekhorst

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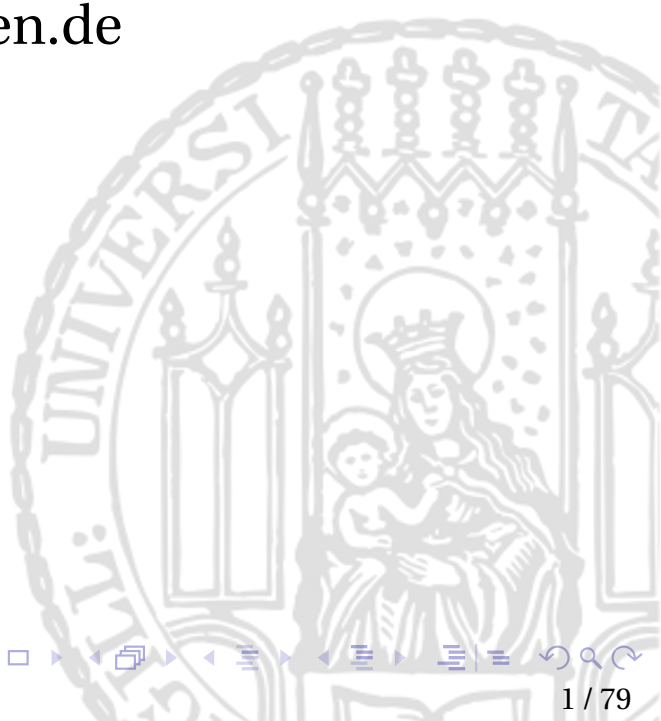

Q1: Hittite as a source for accentual reconstruction

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- Growing recognition among non-Anatolian specialists that Hittite contributes to PIE accentual reconstruction.
- But its implications remain to be fully appreciated.

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- Fundamental challenge of studying word stress ("accent") in Hittite:
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- This fact evidently plays a role in some IEists' cautious exclusion of Hittite evidence from PIE accentual reconstruction — e.g., Clackson (2007:75–6) (cf. Olander 2009:7, 2021):

> *"Little certain is known about the accent systems of Tocharian and Anatolian … Qualitatively our best evidence for PIE accent comes from two of the oldest and most conservative branches: Greek and Vedic Sanskrit. For both languages there is a large body of texts with word-accents marked and adequate metalinguistic descriptions of the nature of the accentual system."*

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- Fundamental challenge of studying word stress ("accent") in Hittite:
  - Stress is not marked in the orthography, but instead must be inferred from its indirect effects, primarily on vowel quantity and quality.
- But philological and comparative-historical scholarship on Hittite over last half century has made significant progress in:
  - Establishing criteria by which the position of stress can be identified.
  - Applying these criteria to determine Hittite stress patterns.

- Important contributions include Hart (1980), Carruba (1981), Kimball (1983, 1999), Melchert (1984, 1992, 1994), and recently Kloekhorst (2008, 2014, to appear); for a critical overview see Yates (2017b:72–102).

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- Above all, this scholarship has converged in support of a relatively close correlation between PLENE SPELLING and word stress — e.g., (1):

(1) *Plene-spelled stressed vowels in Hittite:*

a.	⟨*ne-e-wa-an*⟩	[né:w-an]	'new'	(new-C.ACC.SG)
b.	⟨*e-et-mi*⟩	[é:t-mi]	'I eat'	(eat-1SG.NPST.ACT)
c.	⟨*a-da-a-an*[*-za*]⟩	[at-á:nt͡s]	'eaten'	(eat-PTCP-C.NOM.SG)

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Q1: Hittite as a source for accentual reconstruction

- Based on distribution of plene spelling and other diagnostics, Kloekhorst (2014:643) concludes (cf. Melchert 1994:47, 187, i.a.):

  "Hittite had a stress accent that was free: although for each word the place of the accent is lexically determined, there is in principle no restriction as to which syllable in a given word can or cannot be accented. . . [T]he place of the accent in a Hittite word often can be directly equated with the place of the accent in the corresponding word in Greek or Vedic Sanskrit. Since these languages are generally regarded as reflecting the Proto-Indo-European accent system best, it is clear that Hittite can now be used as a new witness to the original accent of Proto-Indo-European words."

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- Consensus now emerging that stress patterns reconstructed for PIE on basis of Vedic and/or Greek may find additional support in Hittite.
  - e.g., Fortson 2010:178, Weiss 2020:111, Meier-Brügger and Fritz 2021:156

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- Consensus now emerging that stress patterns reconstructed for PIE on basis of Vedic and/or Greek may find additional support in Hittite.
- But thus far little wider recognition of potential importance of the Hittite evidence.

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- Two significant properties of Hittite stress (cf. Yates 2017b:106–15):

  (i) FREE — i.e., phonologically unpredictable, dependent on lexically specific morphological factors — in both nominals and verbs.

  (ii) UNBOUNDED — i.e., potentially surfaces on any syllable within the word (viz., no window restrictions).

Q1: Hittite as a source for accentual reconstruction

(2)

	VEDIC	HITTITE
DIRECTLY MARKED	+	−
UNBOUNDED	+	+
FREE/NOMINALS	+	+
FREE/VERBS	+	+

- Distribution of stress in Hittite aligns with Vedic Sanskrit, which is generally viewed as the most faithful witness to PIE stress (see, e.g., Jasanoff 2017:7).

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⇒ Similarly, Hittite evidence can inform reconstruction of any PIE word or category, if stress patterns can be accurately diagnosed.

Q1: Hittite as a source for accentual reconstruction

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	VEDIC	HITTITE	GREEK
DIRECTLY MARKED	+	−	+
UNBOUNDED	+	+	−
FREE/NOMINALS	+	+	+
FREE/VERBS	+	+	−

- Importance of Greek testimony for PIE accentual reconstruction usually regarded as second only to Vedic.
- But overall Greek distribution is altered by known innovations:
  - (i) "Law of Limitation" (see Probert 2012)
  - (ii) "recessivity" in finite verbs

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- But overall Greek distribution is altered by known innovations:
  - (i) "Law of Limitation" (see Probert 2012)
  - (ii) "recessivity" in finite verbs
  - (iii) Extensive restructuring of stress in athematic nominal inflection:
    - Intraparadigmatic mobility virtually eliminated in polysyllables.
    - Virtually all nominals with monosyllabic stem in oblique are mobile.

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- But overall Greek distribution is altered by known innovations:
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⇒ Hittite evidence could be especially valuable for PIE reconstruction where such innovations make Greek non-probative.

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- Broad take-away — going forward Hittite must be regarded as a primary source for PIE accentual reconstruction.

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- Broad take-away — going forward Hittite must be regarded as a primary source for PIE accentual reconstruction.
- Major question likely to divide future scholarship:

> **Should traditional reconstructions of PIE word prosody ever be revised on the basis of Hittite stress patterns?**

Q2: Non-Hittite Anatolian as a source for reconstruction

QUESTION 2:

Have the non-Hittite Anatolian languages become primary sources for the reconstruction of PIE accent? If so, why?

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Have the non-Hittite Anatolian languages become primary sources for the reconstruction of PIE accent? If so, why?

- No — and it doesn't seem likely they will.
- But their more limited data contributes to reconstruction of Proto-Anatolian (PA) stress, thus to stepwise reconstruction of PIE.

Q2: Non-Hittite Anatolian as a source for reconstruction

- Evidence for stress in non-Hittite ("minor") Anatolian languages is:
  - (i) Limited by poverty of attestation.
  - (ii) Mostly or exclusively historical in nature — i.e.:
    - Observable via effects on adjacent consonants or vowels.
    - But synchronic patterns cannot be reliably determined.
  - (iii) Both (i) and (ii).

Q2: Non-Hittite Anatolian as a source for reconstruction

(3)

	PALAIC			cf. HITTITE	
a.	⟨*a-aš-du*⟩	[á:s-t:u]	‘let him be’	⟨*e-eš-du*⟩	[é:s-t:u]
b.	⟨*a-ḫu-wa-a-an-ti*⟩	[aχ^{w}-á:nti]	‘they drink’	⟨*a-ku-an-zi*	[ak^{w}-ántsi]
c.	⟨*a-ta-a-an-ti*⟩	[at-á:nti]	‘they eat’	⟨*a-da-an-zi*⟩	[at-ántsi]

- **Palaic** is very poorly attested, but what’s available looks Hittite-like.
- Distribution of plene spelling in Palaic suggests it retains inflectional stress mobility in verbal inflection.
  - In (3) plene matches stress alternations observed in Hittite cognates.

Q2: Non-Hittite Anatolian as a source for reconstruction

(4)	a.	Pal.	⟨*mu-u-ši*⟩	[mú:si]	‘you become satiated’
			⟨*mu-ša-a-an-ti*	[mus-á:nti]	‘they become satiated’
	b.	Hitt.	⟨*e-eš-ši*⟩	[é:s-si]	‘you are’
			⟨*a-ša-an-zi*⟩	[as-ántsi]	‘they are’
	c.	Ved.	*ási*		‘you are’
			s-ánti		‘they are’

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⇒ Meagre record of Palaic is a great tragedy for study of IE word stress.

Q2: Non-Hittite Anatolian as a source for reconstruction

(5)	a.	⟨*pa-a-ri-ya-na-a-al*⟩	'future'	(future.ADJ-NOM/ACC.SG)
	b.	⟨*ta-a-i-na-a-ti*⟩	'with oil'	(oil-ABL/INS)
	c.	⟨*a-an-ni-i-ti*⟩	'treats'	(treat-3SG.NPST.ACT)
	d.	⟨*ḫa-at-tu-u-la-a-ḫi-ta-ti*⟩	'with health'	(health-ABL/INS)
	e.	⟨*da-a-ti-i*⟩	'to/for father'	(father-DAT/LOC.SG)

- **Luwian** is better attested (in cuneiform script) and in all likelihood preserves inherited free stress like Hittite.
- But determining synchronic stress patterns is complicated by overabundance of plene spelling — e.g., (5).
  - Such MULTIPLE PLENE SPELLING is frequent (vis-à-vis Hittite)!

Q2: Non-Hittite Anatolian as a source for reconstruction

(6)	a.	Luw. ⟨*wa-a-šu*⟩	‘good’ (N.NOM/ACC.SG)	<	PIE **wósu*
	b.	Luw. ⟨*a-aš-ḫar=ša*	‘blood’	<	PA **h₁ésh₂-r̥*
	c.	Luw. ⟨*tap-pa-ši-i*⟩	‘in heaven’	<	PA **néb^h-es-ei*
	d.	Luw. ⟨*a-pa-a-at-ti*⟩	‘to/for/at that’	<	PA **obéd-V*
	e.	Luw. ⟨*ma-na-a-ti*⟩	‘sees’	<	PIE **mnéh₂-ti*
	f.	Luw. ⟨*ku-wa-li-i-ti*⟩	‘makes turn’	<	PIE **k^{w}ol(h₁)-éye-ti*

- More reliable is the Luwian evidence for historical stress patterns:
  - Plene spelling of inherited short vowels — e.g., (6a–b).
  - Čop’s Law — e.g., (6c–d).
  - PA lenition — e.g., (6e–f) (cf. Sasseville 2020:225).

Q2: Non-Hittite Anatolian as a source for reconstruction

(7)	a.	Lyd.	*fakatwãmid*	‘approaches’	<	PA **wém-ye-ti*
					cf.	Hitt. *wemiyezzi* ‘finds’
	b.	Lyd.	*šadmẽ–*	‘seal’	<	PA **seh$_1$i-món–*
	c.	Lyd.	*qela–*	‘plot of land’	<	PA **k^{w}él(h$_1$)-o–*

- **Lydian** has free stress (Eichner 1986a,b), but is not well-attested or understood, limiting its historical implications.
- It also provides some indirect evidence for inherited stress, e.g., via:
  - PA lenition — e.g., (7a) (cf. Yakubovich 2017, Sasseville 2020:332–3).
  - Stress-conditioned vocalic changes — e.g., reduction of pretonic **e* to *a* in (7b) vs. retention in (7c) (cf. Yates 2020:255–7).
    - Suffixally stressed **–mon*-stem matches Hittite (NOM.PL *išḫimāneš* ‘cords’) and other IE languages, esp. Vedic (e.g., *brah-mán–* ‘priest’).

Q2: Non-Hittite Anatolian as a source for reconstruction

(7)	a.	Lyc.	*tadi*	‘puts’	<	PIE **d^héh$_1$-ti*
	b.	Lyc.	*xttadi*	‘damages’	<	PA **h$_2$ot-éh$_2$-ye-ti*
	c.	Lyc.	*pddẽ*	‘place’	<	PIE **ped-óm*

- Synchronic stress in **Lycian** is unclear, but it provides some historical evidence, e.g., via:
  - PA lenition — e.g., (7a–b) (cf. Sasseville 2020:104).
  - Unstressed vowel syncope — e.g., (7b–c).

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  - Unstressed vowel syncope — e.g., (7b–c).
- Evidence from other Anatolian languages in alphabetic script (Carian, etc.) is even more limited and uncertain.

Q2: Non-Hittite Anatolian as a source for reconstruction

- Broad take-away — the Anatolian languages inform the reconstruction of PIE word prosody via the system that can be reconstructed for PA.
  - Accurately reconstructing PA stress requires fully incorporating the evidence of the "minor" languages.
    - See, e.g., Kümmel (2018) on denominative verb stress in Anatolian and IE.
  - But the principal source for reconstructing PA stress is Hittite, which is the only relatively well-attested Anatolian language that:
    - Clearly maintains inherited stress patterns synchronically.
    - Provides reliable evidence for inflectional stress mobility.

Q3: Hittite evidence for IE accent

QUESTION 3:

What kind of Hittite data can we use as evidence for IE accent? And if Hittite presents a divergence from Greek and Sanskrit, what are we to make of it?

- All identifiable Hittite stress patterns can inform PIE reconstruction.
  - At systemic level PIE word prosody is maintained in Hittite (like Vedic).
  - Stress patterns in well-attested lexemes and productive categories can usually be identified via synchronic and/or historical diagnostics.
- Hittite stress data can play a crucial role in establishing PIE situation, especially in cases where Vedic and Greek diverge.

Q3: Hittite evidence for IE accent

(8)

	MORPH	STRESSED/FULL		UNSTRESSED/REDUCED	
a.	*epp–*	⟨*e-ep-pu-un*⟩	[é:p:-on]	⟨*ap-pa-a-an-t*[*e-eš*]⟩	[ap:-á:nt-es]
	‘take’	take-1SG.PST.ACT		take-PTCP-C.NOM.PL	
b.	*ed–*	⟨*e-et-mi*⟩	[é:t-mi]	⟨[*az*]*-za-as-te-e*[*ni*]⟩	[a͡ts-t:é:ni]
	‘eat’	eat-1SG.NPST.ACT		eat-2PL.NPST.ACT	
c.	*kuer–*	⟨*ku-e-er-zi*⟩	[kʷé:r-t͡si]	⟨*ku-ra-a-an*⟩	[kʷor-á:n]
	‘cut’	cut-3SG.NPST.ACT		cut-PTCP:N.NOM/ACC.SG	
d.	*ḫuek–*	⟨*ḫu-e-ek-zi*⟩	[χʷé:k-t͡si]	⟨*ḫu-ga-a-an-ta-an*⟩	[χʷok-á:nt-an]
	‘slaughter’	slaughter-3SG.NPST.ACT		slaughter-PTCP-C.ACC.SG	

- Principal diagnostic of synchronic Hittite word stress is plene spelling.
- Plene reveals regular patterns of pretonic vowel reduction.
  - Reduction of /e/ to [a] — e.g., (8a–b).
  - Reduction of /e, a/ to [u, o] after labialized obstruents — e.g., (8c–d).

Q3: Hittite evidence for IE accent

(9)

	MORPH	STRESSED/FULL		UNSTRESSED/REDUCED	
a.	*epp–*	⟨*e-ep-pu-un*⟩	[é:p:-on]	⟨*ap-te-ni*⟩	[ap:-té:ni]
	‘take’	take-1SG.PST.ACT		take-2PL.NPST.ACT	
b.	*šeš–*	⟨*še-e-eš-zi*⟩	[sé:s-t͡si]	⟨*ša-ša-an-zi*⟩	[sas-ánt͡si]
	‘sleep’	sleep-3SG.NPST.ACT		sleep-3PL.NPST.ACT	
c.	*kuer–*	⟨*ku-e-er-zi*⟩	[kʷé:r-t͡si]	⟨*ku-ra-an-zi*⟩	[kʷor-ánt͡si]
	‘cut’	cut-3SG.NPST.ACT		cut-3PL.NPST.ACT	
d.	*ḫuwapp–*	⟨*ḫu-wa-ap-pi*⟩	[χʷá:p:-i]	⟨*ḫu-up-pa-an*[*-zi*]⟩	[χʷop:-ánt͡si]
	‘throw’	throw-3SG.NPST.ACT		throw-3PL.NPST.ACT	

- Pretonic vowel reduction can then be used to identify stress when plene is absent.
  - Reduction of /e/ to [a] — e.g., (9a–b).
  - Reduction of /e, a/ to [u, o] after labialized obstruents — e.g., (9c–d).

Q3: Hittite evidence for IE accent

(10)

	MORPH	STRESSED/FULL		UNSTRESSED/REDUCED	
a.	*pišen–*	⟨*pi-še-e-nu-uš*⟩	[pisé:n-os]	⟨[*p*]*i-iš-na-a-aš*⟩	[pisn-á:s]
	'man'	man-C.ACC.PL		man-GEN.SG	
b.	*zai–*	⟨*za-a-i*⟩	[t͡sá:-i]	⟨*zi-iš-te-e-ni*⟩	[t͡si-st:é:ni]
	'cross'	cross-3SG.NPST.ACT		cross-2PL.NPST.ACT	
c.	*tekan–*	⟨*te-e-kán*⟩	[té:kan]	⟨*ták-na-a-aš*⟩	[takn-á:s]
	'earth'	earth:N.NOM/ACC.SG		earth-GEN.SG	
d.	*–weni*	⟨*ša-šu-e-ni*⟩	[sas-wé:ni]	⟨*pa-a-i-wa-ni*⟩	[pá:i-wani]
	1PL	sleep-1PL.NPST.ACT		go-1PL.NPST.ACT	

- Some less common Hittite patterns of unstressed vowel reduction:
  - Pretonic deletion (/e, a/ → [∅]), e.g., (5a–c).
  - Variable reduction of /e/ to [a] in post-tonic open syllables, e.g., (5d).

Q3: Hittite evidence for IE accent

- These diagnostics in combination allow synchronic stress patterns of many Hittite words to be determined with some confidence.
- Hittite stress patterns then become data points for comparative reconstruction, with potential impact on PIE word prosody.

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- An illustrative case study:
  - Animate *–*oi*-stems in Hittite and PIE (Yates 2019c).

Q3: Hittite evidence for IE accent

(11)

	SG	PL
NOM	R(*é*)-*ōi*	R(*é*)-*oy*-*es*
ACC	R(*é*)*oy*-*m̥*	R(*é*)-*oy*-*m̥s*
GEN	R(∅)-*y*-*é*/*ós*	R(∅)-*y*-*óh*$_{1/3}$*om*

- Erlangen Model (EM) reconstructs "amphikinetic" (AK) inflection for PIE primary animate *–*oi*-stems (Schindler 1969:154–5; cf. Rix 1992:146–7, Weiss 2020:259, *i.a.*) — i.e., (11).

Q3: Hittite evidence for IE accent

(11)

	SG	PL
NOM	R(*é*)-*ōi*	R(*é*)-*oy*-*es*
ACC	R(*é*)*oy*-*m̥*	R(*é*)-*oy*-*m̥s*
GEN	R(∅)-*y*-*é/ós*	R(∅)-*y*-*óh*$_{1/3}$*om*

- Erlangen Model (EM) reconstructs "amphikinetic" (AK) inflection for PIE primary animate **–oi*-stems (Schindler 1969:154–5; cf. Rix 1992:146–7, Weiss 2020:259, *i.a.*) — i.e., (11).
- Lone Indo-Iranian **–oi*-stem in (12) with fixed root stress held to support reconstruction in (11) (Lindner 2021:26, i.a.), although morphologically it differs (non-primary per Schindler 1969:154 n. 65):

(12)

NOM.PL	Ved. *sákhāyas*	'friends'	<	**sók*^{w}-*h*$_2$-*oy*-*es*$^{?}$
DAT.SG	Ved. *sákhye*	'for a friend'	<<	**sok*^{w}-~~*h*$_2$~~-*y*-*éi*
			cf.	Lat. *socius*

Q3: Hittite evidence for IE accent

(13)

	PIE		HITTITE	
NOM.SG	*h_1*lén$\widehat{g}^h$*-ōi*	>	⟨*li-in-ga-iš*⟩	'oath'
ACC.SG	*h_1*lén$\widehat{g}^h$*-oy-m̥*	>	⟨*li-in-ga-in*⟩	"
GEN.SG	*h_1*ln̥$\widehat{g}^h$*-y-és*	>>	⟨*li-in-ki(-ya)-aš*⟩	'of the oath'

- Kloekhorst (2013:122) likewise reconstructs *–*oi*-stems with AK inflection, derives Hitt. *lingai*– 'oath' from the AK paradigm in (13).

Q3: Hittite evidence for IE accent

(13)

	PIE		HITTITE	
NOM.SG	*h_1*lén*$\widehat{g}^h$*-ōi*	>	⟨*li-in-ga-iš*⟩	'oath'
ACC.SG	*h_1*lén*$\widehat{g}^h$*-oy-*$\underset{\circ}{m}$	>	⟨*li-in-ga-in*⟩	"
GEN.SG	*h_1*l$\underset{\circ}{n}\widehat{g}^h$*-y-és*	>>	⟨*li-in-ki(-ya)-aš*⟩	'of the oath'

- Kloekhorst (2013:122) likewise reconstructs *–*oi*-stems with AK inflection, derives Hitt. *lingai*– 'oath' from the AK paradigm in (13).
- But on this analysis suffixal plene spelling in (14) is unexplained.

(14) Hitt. ⟨*li-in-ga-a-uš*⟩ [liŋk-á:(y)-os] 'oaths' (oath-ANIM.ACC.PL)
(KUB 17.21 iv 16; KUB 23.78: 10, 12; KUB 17.26 i 11)

Q3: Hittite evidence for IE accent

(15)

	STRONG (NOM.SG)		
a.	⟨*ḫur-da-a-iš*⟩	[χʷort-á-i-s]	‘curse’
b.	⟨*za-aḫ-ḫa-a-iš*⟩	[t͡saχ-á-i-s]	‘fight’
c.	⟨*wa-aš-ta-a-iš*⟩	[wast-á-i-s]	‘sin’
d.	⟨[*ma-a-n*]*i-ya-aḫ-ḫa-a-iš*⟩	[ma-niy-aχ-á-i-s]	‘administrative district’
e.	⟨*ḫu-uk-ma-a-iš*⟩	[χʷokm-á-i-s]	‘incantation’

- All well-attested Hittite reflexes of *–*oi*-stems occur one or more times with plene spelling of the suffixal vowel in strong cases — e.g., (15).

Q3: Hittite evidence for IE accent

(15)

	STRONG (NOM.SG)		
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d.	⟨[*ma-a-n*]*i-ya-aḫ-ḫa-a-iš*⟩	[maːniy-aχː-áːi-s]	‘administrative district’
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- All well-attested Hittite reflexes of *–*oi*-stems occur one or more times with plene spelling of the suffixal vowel in strong cases — e.g., (15).
- Vowel reduction in (15a) corroborates suffixal stress — compare:

(16)

a.	⟨*ḫur-ta-an-du*⟩	[χʷortː-ántu]	‘let them curse’
b.	⟨*ḫu-wa-ar-za-aš-ta*⟩	[χʷáːrt͡s-tːa]	‘(s)he cursed’

Q3: Hittite evidence for IE accent

(17)

	STRONG		WEAK (GEN.SG)		
a.	⟨*ḫur-da-a-iš*⟩	[χʷortːáːi-s]	⟨*ḫur-ti-ya-aš*⟩	[χʷortːáːs]	‘curse’
b.	⟨*za-aḫ-ḫa-a-iš*⟩	[t͡saχːáːi-s]	⟨*za-aḫ-ḫi-ya-aš*⟩	[t͡saχːáːs]	‘fight’
c.	⟨*li-in-ga-a-uš*⟩	[liŋk-áː(y)-os]	⟨*li-in-ki(-ya)-aš*⟩	[liŋk-áːs]	‘oath’

- Oldest layer of Hittite **–oi*-stems show deletion of suffixal vowel in weak cases, indicating shift of stress to inflectional endings.

Q3: Hittite evidence for IE accent

(17)

	STRONG		WEAK (GEN.SG)		
a.	⟨*ḫur-da-a-iš*⟩	[χʷortːáːi-s]	⟨*ḫur-ti-ya-aš*⟩	[χʷortːáːs]	‘curse’
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c.	⟨*li-in-ga-a-uš*⟩	[liŋk-áː(y)-os]	⟨*li-in-ki(-ya)-aš*⟩	[liŋk-áːs]	‘oath’

- Oldest layer of Hittite **–oi*-stems show deletion of suffixal vowel in weak cases, indicating shift of stress to inflectional endings.
- Comprehensive assessment of the class by Rößle (2002:324), who describes a “voralthethitisch virtuell hysterodynamisches Paradigma.”

Q3: Hittite evidence for IE accent

(17)

	STRONG		WEAK (GEN.SG)		
a.	⟨*ḫur-da-a-iš*⟩	[χʷortːá:i-s]	⟨*ḫur-ti-ya-aš*⟩	[χʷortːy-á:s]	‘curse’
b.	⟨*za-aḫ-ḫa-a-iš*⟩	[t͡saχːá:i-s]	⟨*za-aḫ-ḫi-ya-aš*⟩	[t͡saχːy-á:s]	‘fight’
c.	⟨*li-in-ga-a-uš*⟩	[liŋk-á:(y)-os]	⟨*li-in-ki(-ya)-aš*⟩	[liŋk-y-á:s]	‘oath’

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- Comprehensive assessment of the class by Rößle (2002:324), who describes a “voralthethitisch virtuell hysterodynamisches Paradigma.”
- Apparent full-grade in (17c) (< **h₁lénĝʰ-oi-* per Kloekhorst 2013) may be due to inner-Hittite derivation from (or analogical remodeling after) synchronically non-ablauting verb *link–* ‘swear’:

(18)
a. *link-āi–* [liŋk-á:i-] ⇐ *link–* ‘swear’ (cf. 3PL.IMP *linkandu*)
b. *ḫurt-āi–* [χʷortː-á:i-] ⇐ *ḫuwart/ḫurt—* ‘curse’ (cf. 3PL.IMP *ḫurtandu*)

Q3: Hittite evidence for IE accent

(17)

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a.	⟨*ḫur-da-a-iš*⟩	[χʷortːáːi-s]	⟨*ḫur-ti-ya-aš*⟩	[χʷortːáːs]	‘curse’
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c.	⟨*li-in-ga-a-uš*⟩	[liŋk-áː(y)-os]	⟨*li-in-ki(-ya)-aš*⟩	[liŋk-áːs]	‘oath’

- Oldest layer of Hittite **–oi*-stems show deletion of suffixal vowel in weak cases, indicating shift of stress to inflectional endings.
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- Apparent full-grade in (17c) (< $*h_1 lén\hat{g}^h$*-oi-* per Kloekhorst 2013) may be due to inner-Hittite derivation from (or analogical remodeling after) synchronically non-ablauting verb *link–* ‘swear’.
  - **But could suffixal stress in Hittite be a post-PIE innovation?**

Q3: Hittite evidence for IE accent

(18)

	STRONG	WEAK		
a.	φειδώ	φειδοῖ	‘sparing’	(F.NOM/DAT.SG)
b.	πειθώ	πειθοῦς	‘P/persuasion’	(F.NOM/GEN.SG)
c.	χρε(ι)ώ	χρειοῖ	‘need’	(F.NOM/DAT.SG)
d.	καμῑνώ	καμῑνοῖ	‘furnace-woman’	(F.NOM/DAT.SG)
e.	Ἐρατώ	Ἐρατοῖ	‘Erato (nymph)’	(F.NOM/DAT.SG)
f.	Καλλιστώ	Καλλιστοῦς	‘Callisto (nymph)’	(F.NOM/GEN.SG)

- Greek reflexes of PIE *–*oi*-stems are prosodically uniform, showing:
  - Suffixal stress in the strong cases.
  - Historical suffixal stress in weak (GEN.SG -οῦς < *–*óy-os*, DAT -οῖ < *–*óy-i*).

Q3: Hittite evidence for IE accent

(19) *"Amphi-hysterokinetic" inflection of PIE* *–oi-*stems*:

	SG	PL
NOM	X-*ói*	X-*óy-es*
ACC	X-*óy-m̥*	X-*óy-m̥s*
GEN	X-*y-é/ós*	X-*y-óh$_{1/3}$om*

- Comparison of Greek and Hittite supports reconstructing PIE animate *–*oi*-stems with stress mobility between suffix in strong cases and inflectional endings in weak — i.e., (19) (see further Yates 2019c).
  - Inherited pattern preserved in Hittite.
  - Elimination of paradigmatic ablaut in Greek is paralleled by other classes with same historical stress alternation — e.g., ANIM *–*ter*-stems (δοτήρ, δοτῆρ-ος 'giver'), *–*men*-stems (πυθμήν, πυθμέν-ος 'bottom').
  - Fixed stress in Ved. *sákh(ā)y–* 'friend' is probably innovative.

Q3: Hittite evidence for IE accent

- Broad take-away — Hittite stress data can always inform PIE reconstruction, and in some cases it **does** provide crucial evidence.
  - Convergence with Greek (against Vedic) on suffixal stress in *–*oi*-stems requires revisions to EM's AK reconstruction of this class.

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- Broad take-away — Hittite stress data can always inform PIE reconstruction, and in some cases it **does** provide crucial evidence.
  - Convergence with Greek (against Vedic) on suffixal stress in *–*oi*-stems requires revisions to EM's AK reconstruction of this class.
  - Likely that traditional reconstructions of *–*r*/*n*-stems must be changed on the basis of Hittite stress patterns in this class (Yates 2019a, 2021a,c).

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- Broad take-away — Hittite stress data can always inform PIE reconstruction, and in some cases it **does** provide crucial evidence.
  - Convergence with Greek (against Vedic) on suffixal stress in *–*oi*-stems requires revisions to EM's AK reconstruction of this class.
  - Likely that traditional reconstructions of *–*r*/*n*-stems must be changed on the basis of Hittite stress patterns in this class (Yates 2019a, 2021a,c).
- Major question posed above should accordingly be modified:

> **What other traditional reconstructions of PIE word prosody be revised on the basis of Hittite stress patterns?**

Q4: On Hittite plene spelling

QUESTION 4:

What is plene spelling and how are we do deal with it?

- Hittite long vowels are optionally marked with plene spelling.
- Long vowels strongly tend to be stressed due to historical and synchronic processes that:
  - Lengthen certain stressed short vowels.
  - Shorten unstressed long vowels.
- Plene spelling thus generally indicates word stress — and should be used to investigate the Hittite stress system and its PIE implications.

Q4: On Hittite plene spelling

(20) Hitt. ⟨*te-e-kán*⟩ [té:kan] < PIE **dʰéĝʰ-ōm* ‘earth’ (ANIM.NOM.SG)

- Three points of general agreement:
  - Plene spelling marks increased vowel length (Hrozný 1917:xii), which is its fundamental function (cf. Kloekhorst 2014:18)
  - Some plene spellings mark inherited short vowels historically lengthened under stress (Hrozný 1917:186–7).
  - Unstressed inherited long vowels were shortened, hence not spelled plene (Eichner 1973:79,86).

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  - Unstressed inherited long vowels were shortened, hence not spelled plene (Eichner 1973:79,86).

⇒ Historically, a relatively close correlation between plene and stress is expected.

- See Kimball (1999:54–68, 124–9) and Kloekhorst (2014:13–8) with references.

Q4: On Hittite plene spelling

(21)

	PLENE	NON-PLENE	SR	
a.	⟨*te-e-ez-zi*⟩	⟨*te-ez-zi*⟩	[té:-t͡si]	‘says’ (3SG.NPST.ACT)
b.	⟨*ne-e-pí-ša-aš*⟩	⟨*ne-pí-ša-aš*⟩	[né:pis-as]	‘of heaven’ (N.GEN.SG)
c.	⟨*ḫa-a-ra-na-an*⟩	⟨*ḫa-ra-na-an*⟩	[χá:ran-an]	‘eagle’ (C.ACC.SG)

- A working theory of the relationship between stress, vowel length, and plene in Hittite — first pass (Yates 2017b:72–98):
  - (i) Only stressed vowels are long.
  - (ii) Only long vowels are spelled plene.
    - ⇒ Plene spelling indicates a vowel is long/stressed.
  - (iii) Plene spelling is **optional**.
    - ⇒ Absence of plene in a single attestation is uninformative, but systematic absence across attestations suggests a vowel is short.

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Q4: On Hittite plene spelling

(22)

	MORPH	STRESSED/LONG		UNSTRESSED/SHORT	
a.	*šāk̆k–*	⟨*šākki*	[sáːkː-i]	⟨*ša-ak-te-e-ni*⟩	[sak-téːni]
	‘know’	know-3SG.NPST.ACT		know-2PL.NPST.ACT	
b.	*–ān̆t–*	⟨*ap-pa-a-an-t*[*e-eš*]⟩	[apː-áːnt-es]	⟨*a-an-ša-an-te-eš*⟩	[áːns-ant-es]
	PTCP	take-PTCP-C.NOM.PL		wash-PTCP-C.NOM.PL	
c.	*–ēš*	⟨*iš-ḫe-e-eš*⟩	[isχː-éːs]	⟨*la-a-le-eš*⟩	[láːl-es]
	C.NOM.PL	master-C.NOM.PL		tongue-C.NOM.PL	
d.	*–ī̆*	⟨*iš-ši-i*⟩	[isː-íː]	⟨*me-e-ḫu-ni*⟩	[méːχʷon-i]
	DAT/LOC.SG	mouth-DAT/LOC.SG		time-DAT/LOC.SG	

- Analogy could have disrupted historically expected correlation between vowel length and stress, but allomorphy in (22) suggests not.
- Plene spellings reflect synchronic quantitative alternations ([V́ː]~[V]) conditioned by stress (cf. Melchert 1994:106–8, Yates 2017b:72–98).

Q4: On Hittite plene spelling

(23)	a.	⟨*i-da-a-la-u-e-eš*⟩	[itá:law-es]	‘evil’ (ADJ.C.NOM.PL)
	b.	⟨*uk-tu-u-ri-i-e-eš*⟩	[uktó:riy-es]	‘eternal’ (ADJ.C.NOM.PL)
	c.	⟨*me-e-ḫu-u-ni*⟩	[mé:χʷon-i]	‘at the time’ (N.DAT/LOC.SG)
	d.	⟨*ḫu-u-wa-a-i*⟩	[χʷá:-i]	‘runs’ (3SG.NPST.ACT)
	e.	⟨*e-ep-pu-u-un*⟩	[é:p:-on]	‘I took’ (1SG.PST.ACT)

- Now generally agreed that (23) include contexts in which plene may be non-length marking (cf. Kloekhorst 2014:18, 134–61, 521):
  - ⟨°*i-e-eC*⟩, ⟨°*u/ú-e-eC*⟩ spellings are equivalent to “⟨*ye-eC*⟩”, “⟨*we-eC*⟩”, do not reliably indicate length — e.g., (21a–b).
  - Spellings ⟨*ḫu-u*⟩ are equivalent to ⟨*ḫu*⟩, do not reliably indicate length — e.g., (21c–d) (cf. Kimball 1999:67–8).
  - ⟨*u*⟩ rarely disambiguates vowel quality (= [o]; ≠ [u]) rather than marking length — e.g., (21e) (cf. Melchert 2020:269).

Q4: On Hittite plene spelling

(24) a. ROOT + INFLECTION:

⟨*ša-ak-te-e-ni*⟩ [sak-téːni] ‘y’all know’

b. ROOT + SUFFIX + INFLECTION:

⟨*me-e-ḫu-ni*⟩ [méːχʷon-i] ‘at the time’

c. ROOT (+ SUFFIX) + PTCP/IPFV + INFLECTION:

⟨*ap-pa-a-an-t*[*e-eš*]⟩ [apː-áːnt-es] ‘taken’

- Words of structure in (24) appear to exhibit at most one length-marking plene spelling, as predicted by theory:
  - (Historically) primary formations, i.e., (24a–b).
  - Participles (–*ant*–) and imperfective (–*šḱe*–) of (historically) primary verbs, i.e., (24c).

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  - (Historically) primary formations, i.e., (24a–b).
  - Participles (–*ant*–) and imperfective (–*šḱe*–) of (historically) primary verbs, i.e., (24c).
- But problems arise in words of greater morphological complexity.

Q4: On Hittite plene spelling

(25)	a.	*āppalāweni*	[aːpːal-áː-weni]	‘we entrap’	⇐	*āppala–*	‘trap’
	b.	*iwārwāer*	[iwaːrw-áːy-er]	‘bestowed a dowry’	⇐	*iwāru–*	‘dowry’
	c.	*mūgāmi*	[moːk-áː-mi]	‘I incite’	⇐	*mūka–**	‘goad’
	d.	*āššūl*	[aːsːúːl]	‘favor’	⇐	*āššu–*	‘good’

- (Historical) non-primary derivatives like (25) often exhibit MULTIPLE PLENE SPELLING (across attestations).
- Per Kimball (1999:129) suffix *–a(i)–* in (25) is long/stressed; preceding vowel is long by analogy to base.

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	d.	*āššūl*	[aːsːúːl]	‘favor’	⇐	*āššu–*	‘good’

- Multiple plene can be analyzed as CYCLICITY (Yates 2017b:91–7)
  - CYCLICITY ≈ a phonological property is transferred from a base to its derivative, resulting in opaque under- or overapplication of an active phonological process in this derivative.
  - (“synchronic analogy” per Kiparsky 2015:3)

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- Multiple plene can be analyzed as CYCLICITY (Yates 2017b:91–7)
  - When base occurs independently, its plene spelled vowel is stressed/long.
  - Long vowel is “transferred” from base to derivative, where suffix *–a(i)–* is spelled plene because it is stressed/long.
- See Yates (to appear) for evidence of cyclic effects in (P)IE morphophonology.

Q4: On Hittite plene spelling

(21)

	PLENE	NON-PLENE	SR	
a.	⟨*te-e-ez-zi*⟩	⟨*te-ez-zi*⟩	[téː-t͡si]	‘says’ (3SG.NPST.ACT)
b.	⟨*ne-e-pí-ša-aš*⟩	⟨*ne-pí-ša-aš*⟩	[néːpis-as]	‘of heaven’ (N.GEN.SG)
c.	⟨*ḫa-a-ra-na-an*⟩	⟨*ḫa-ra-na-an*⟩	[χáːran-an]	‘eagle’ (C.ACC.SG)

- A working theory of the relationship between stress, vowel length, and plene in Hittite —revised (Yates 2017b:72–98):
  - (i) Only vowels stressed in some surface form are long.
  - (ii) Only long vowels are spelled with plene in diagnostic contexts.
    - ⇒ Plene spelling indicates a vowel is long/stressed.
  - (iii) Plene spelling is **optional**.
    - ⇒ Absence of plene in a single attestation is uninformative, but systematic absence across attestations suggests a vowel is short.

Q4: On Hittite plene spelling

- Upshot of this theory — plene spelling correlates closely with stress and can be used to identify stress patterns:
  - Reliably in (historical) primary derivatives, since these contain maximally one long/stressed vowel.
  - Cautiously in (historical) non-primary derivatives, which may contain multiple long vowels.

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⇒ Hittite stress can be studied (if still imperfectly) on its own terms using synchronic stress diagnostics.

- Yet this theory relies crucially on **optionality** of plene writing, which is rejected by Kloekhorst (2014).

Q4: On Hittite plene spelling

(26)

	PLENE	NON-PLENE	
a.	⟨*te-e-ez-zi*⟩	⟨*te-ez-zi*⟩	'says' (3SG.NPST.ACT)
b.	⟨*ne-e-pí-ša-aš*⟩	⟨*ne-pí-ša-aš*⟩	'of heaven' (N.GEN.SG)
c.	⟨*ḫa-a-ra-na-an*⟩	⟨*ḫa-ra-na-an*⟩	'eagle' (C.ACC.SG)

- Two established distributional properties of plene (cf. Yates 2016a):
  - (i) VARIABILITY: virtually all well-attested words with plene spelling show intra- and/or inter-text inconsistency in its usage in compositions of all historical periods — e.g., (26) in Old Script.
  - (ii) ASYMMETRIC FREQUENCY: Plene spelling is more frequent (a) in open syllables than in closed syllables; and (b) in older texts than younger.

Q4: On Hittite plene spelling

(27)

	PLENE	NON-PLENE	SR	
a.	⟨*te-e-ez-zi*⟩	⟨*te-ez-zi*⟩	[té:-t͡si]	'says' (3SG.NPST.ACT)
b.	⟨*ne-e-pí-ša-aš*⟩	⟨*ne-pí-ša-aš*⟩	[né:pis-as]	'of heaven' (N.GEN.SG)
c.	⟨*ḫa-a-ra-na-an*⟩	⟨*ḫa-ra-na-an*⟩	[χá:ran-an]	'eagle' (C.ACC.SG)

- Traditional explanations of these properties (cf. Yates 2016a):
  - VARIABILITY reflects fundamental **optionality** of plene spelling — usage indicates a vowel is long, but non-usage does necessarily indicate it is short (cf. Melchert 1994:27, Kimball 1999:56).
  - ASYMMETRIC FREQUENCY of plene in closed vs. open syllables due in part to less **V́* lengthening in closed σ, in part to orthographic economy.
  - Lower frequency of plene in later texts simply reflects decreasing use of **optional** orthographic practice.

Q4: On Hittite plene spelling

(28)

	PLENE	NON-PLENE	SR	
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- Kloekhorst (2014) challenges the traditional view:
  - Plene spelling is fundamentally **non-optional** — significant VARIABILITY within a historical stratum indicates a half-long vowel; exceptions to consistent (non-)plene spelling are errors/extralinguistic.
  - ASYMMETRIC FREQUENCY of plene in closed vs. open syllables due in part to less **V́* lengthening in closed σ, in part to conditioned inner-Hittite shortenings in closed σ.
  - Lower frequency of plene in later texts simply reflects general diachronic shortening of (half-)long vowels, especially in closed σ.

Q4: On Hittite plene spelling

- Overall — Kloekhorst 2014 is a rigorous attempt to answer:

  - **Can the distribution of plene spelling in Hittite be plausibly explained under the view that it is non-optional and that its frequency is phonologically significant?**

Q4: On Hittite plene spelling

- Overall — Kloekhorst 2014 is a rigorous attempt to answer:

  - **Can the distribution of plene spelling in Hittite be plausibly explained under the view that it is non-optional and that its frequency is phonologically significant?**

    - No (Kimball 2015; Sideltsev and Molina 2016; Yates 2016a; Melchert 2018).

Q4: On Hittite plene spelling

- Kloekhorst's (2014) analysis encounters empirical problem — e.g.:
  - Frequency mismatch in OH between *pēḫḫi* 'I give' (100% plene) and *tēḫḫi* 'I place' (64.3%).
  - Increase in frequency of plene between MH and NH in *ḫăriya–* 'valley,' *pĕda–* 'bring', *peḫute–* 'carry off'.
  - Unexpectedly infrequent plene of *[éː] attributed to shortening "before a dental consonant" within OH, but *utēzzi* 'moisture' has plene in MH.
  - Plene spelling of *[é] in closed syllables should never occur, but does — e.g., *šēšta* 'slept', *mērtu* 'let him disappear'.
  - Inconsistent criteria for length — e.g., *šăkuwa* 'eyes' (60% plene in MH) has [áː], but *ḫăli–* 'pen' (82% in NH) has [á˙].

⇒ Such cases require (ad hoc) analogical or extra-linguistic explanations, or are left unaddressed.

Q4: On Hittite plene spelling

(29) a. PIE *h_1*és-ti* > Hitt. ⟨*e-eš-zi*⟩ [éːs-t͡si] ‘is’ (3SG.NPST.ACT)

- Consistent and diachronically stable plene spelling in words like (29a) is unexpected on Kloekhorst’s (2014) analysis of vowel length.

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	b. PIE **h₁esh₂-ó-s*	> Hitt. ⟨*iš-ḫa-a-aš*⟩	[isχ:-á:s]	‘master’ (C.NOM.SG)
		> Hitt. ˣ⟨*i-iš-ḫa-a-aš*⟩	[ʔisχ:-á:s]	
	c. PIE **h₁eh₁-s-(é)i*	> Hitt. ⟨*iš-ši-i*⟩	[is:-í:]	‘mouth’ (N.DAT/LOC.SG)
		> Hitt. ˣ⟨*i-iš-ši-i*⟩	[ʔis:-í:]	
	d. PIE **h₁rs-énti*	> Hitt. ⟨*ar-ša-an-zi*⟩	[ars-ánt͡si]	‘flow’ (3PL.NPST.ACT)
		> Hitt. ˣ⟨*a-ar-ša-an-zi*⟩	[ʔars-ánt͡si]	

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  - Wrongly predicts initial plene spelling in (29b–d).

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b.	PIE *h_1*esh$_2$-ó-s*	> Hitt. ⟨*iš-ḫa-a-aš*⟩	[isχ:-á:s]	‘master’ (C.NOM.SG)
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  - Wrongly predicts initial plene spelling in (29b–d).
  - Alleged Akkadian basis for orthographic practice is false (Rieken 2010; Weeden 2011, i.a.).

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- Kloekhorst (2008, 2014) argues that ⟨#*V*-⟩ spells [ʔ] (< PIE *h_1*) — but this hypothesis is untenable.
- Orthographic economy probably played a role in establishing spelling convention — ⟨*V-VC*⟩ spelling is “cheaper” than ⟨*CV-V-VC*⟩.

Q4: On Hittite plene spelling

(30) a.	⟨*ti-it-ḫa*⟩	[títχː-a]	‘thunders’	(KBo 17.11 i 9, OH/OS)
	⟨*ši-iš-du*⟩	[sísː-tːu]	‘let (him) prosper’	(KUB 12.43, 2, 3, OH/OS)
b.	⟨*te-e-et-ḫa*⟩	[téːtχː-a]	‘thunders’	(KUB 32.135 i 3, 10, OH/MS)
	⟨*še-e*[*-eš-du*]⟩	[séːsː-tːu]	‘let (him) prosper’	(KBo 2.32 rev. 6, NH/NS)

- Emergence of new long vowels in later Hittite runs counter to general diachronic tendency toward shortening hypothesized by Kloekhorst (2014) — e.g. (30a) vs. (30b).
  - (30a) shows *i*-vocalism in OH, predictably short in closed σ and thus non-plene.
  - But after “NH lowering” (/i/ > /e/; see Yakubovich 2010:309–33), vowel begins to be spelled plene ([éː]) as in (30b).

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  ⇒ Indicates a synchronic stressed vowel lengthening process (/e/ → [éː]) active in language (Yates 2016a; cf. Melchert 1994:133–5).

Q4: On Hittite plene spelling

(31) *Unstressed long vowels in Hittite per Kloekhorst 2014*:

a. Hitt. ⟨*ta-a-i-ez-zi*⟩ [taːyé-t͡si] ‘steals’ < PIE **steh$_2$-yé-ti*

b. Hitt. ⟨*ḫa-at-ra-a-ez-zi*⟩ [χatraː-é-t͡si] ‘writes’ < PIE **h$_2$et-ro-yé-ti*

- Kloekhorst (2014) allows for new long vowels to emerge within Hittite via phonological changes like compensatory lengthening (!) in (31).

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⇒ If correct, value of plene spelling as a synchronic diagnostic of word stress would be seriously compromised.

- But stress on the plene spelled vowel is as probable or more so:
  - Full-grade of root vowel in (31a) points to a pre-form in **stéh$_2$-ye/o–* (*LIV*^{2}: 616; cf. Ved. *páśyati* ‘sees’).
  - Cognate class of (31b) in Luwian regularly shows lenition (Kümmel 2018; Sasseville 2020).

Q5: Compositional vs. paradigmatic models

QUESTION 5:

To what extent do the two main approaches to accentuation (i.e., paradigmatic, compositional) affect reconstruction?

- Divergences between PARADIGMATIC and COMPOSITIONAL models:
  - **Scope**
  - **Target** (chronologically "deep" vs. "shallow")
  - **Tools**
- "Shallow" compositional reconstructions may undercut evidence for assumptions underlying "deeper" paradigmatic reconstructions.

Q5: Compositional vs. paradigmatic models

- PARADIGMATIC and COMPOSITIONAL approaches differ in **scope**.

Q5: Compositional vs. paradigmatic models

(31')

CLASS	DIRECT	OBLIQUE
ACROSTATIC 1 (AS1)	R(*é́*)-S(∅)-E	R(*é*)-S(∅)-E
ACROSTATIC 2 (AS2)	R(*ó*)-S(∅)-E	R(*é*)-S(∅)-E
PROTEROKINETIC (PK)	R(*é*)-S(∅)-E	R(∅)-S(*é*)-E
HYSTEROKINETIC (HK)	R(∅)-S(*é*)-E	R(∅)-S(∅)-É
AMPHIKINETIC (AK)	R(*é*)-S(*o*)-E	R(∅)-S(∅)-É

- PARADIGMATIC and COMPOSITIONAL approaches differ in **scope**.
- EM (and related PARADIGMATIC models) make explicit claims only about word-prosodic patterns (i.e., stress, ablaut) of primary (R+S+E) athematic nouns and adjectives within their inflectional paradigms.
  - EM reconstructs four(/five) distinct classes in (31').
  - Leiden Model posits fewer classes: "(acro)static"; "proterodynamic"; "hysterodynamic" (with more complex alternations, split within direct).

Q5: Compositional vs. paradigmatic models

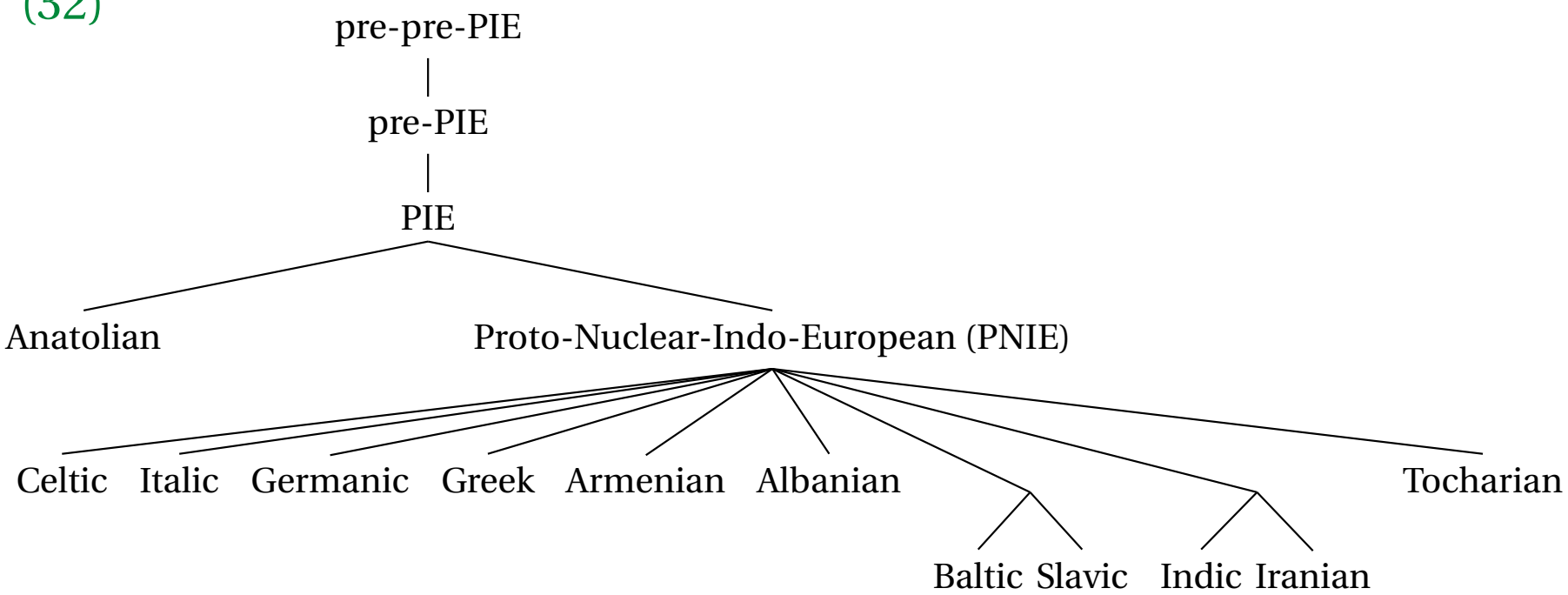
(31")

- ✓ primary athematic nominals
- ✓ primary thematic nominals
- ✓ non-primary nominals
- ✓ verbs
- ✓ compounds
- ✓ etc.

- PARADIGMATIC and COMPOSITIONAL approaches differ in **scope**.
- Goal of COMPOSITIONAL models is provide a general theory of PIE word stress and how it interacts with ablaut.
- They are thus concerned with all formations in (31") and the prosodic generalizations that obtain across them.

Q5: Compositional vs. paradigmatic models

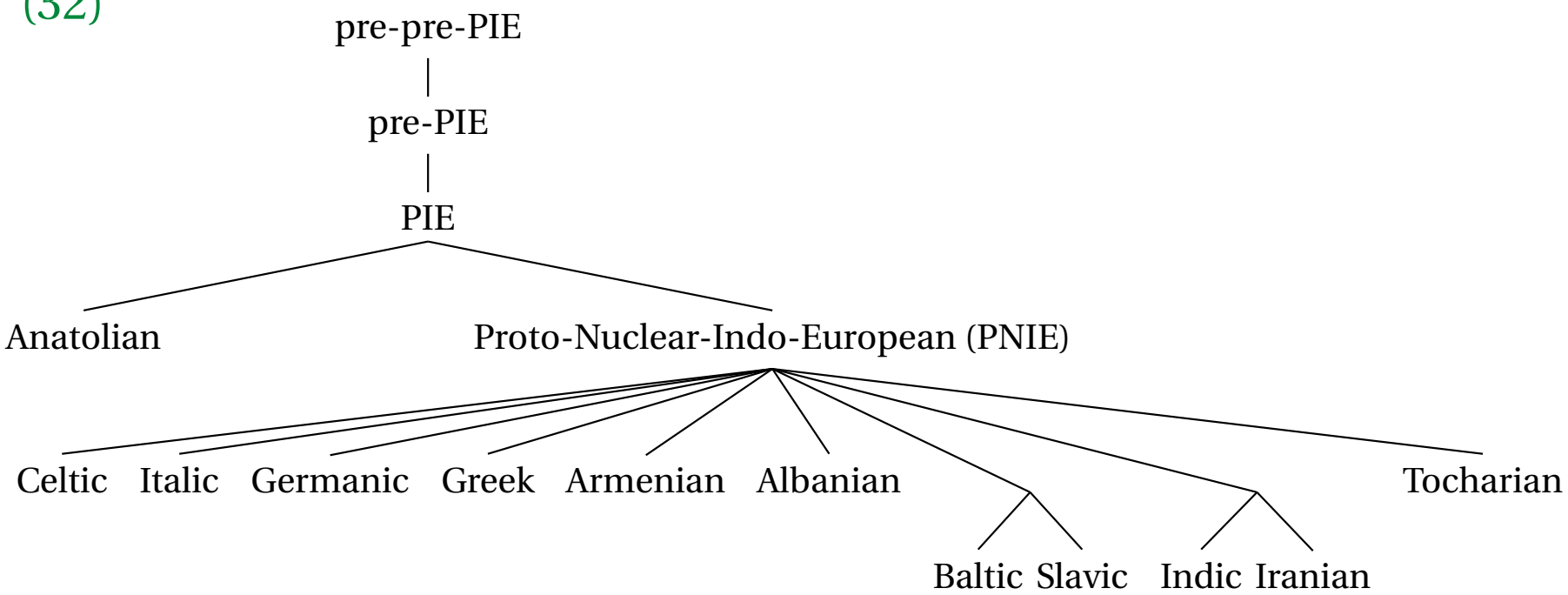
(32)



- PARADIGMATIC and COMPOSITIONAL models differ in their **target**.

Q5: Compositional vs. paradigmatic models

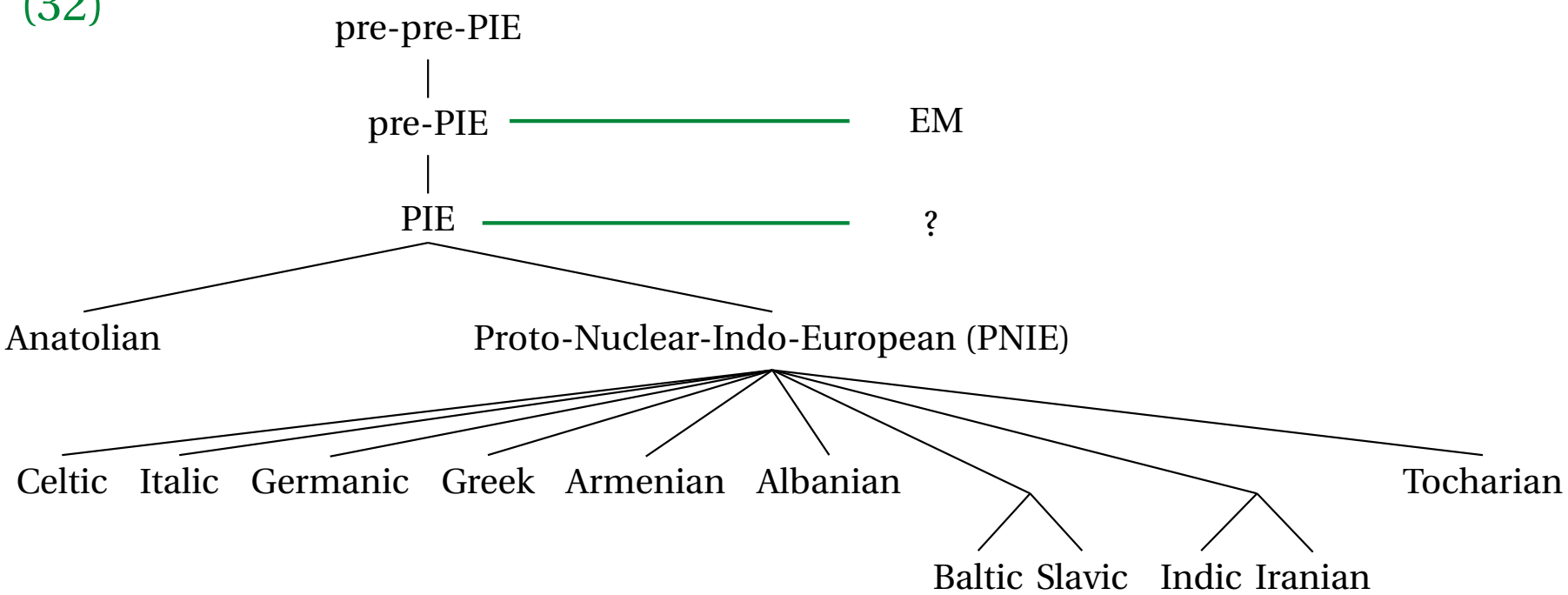
(32)



- PARADIGMATIC and COMPOSITIONAL models differ in their **target**.
- In reconstructing neuter *–*es*-stems Schindler (1975) distinguished:
  - Inflectional patterns in the "letzten Studium der Gemeinsprache" (= PIE), determined by comparative reconstruction.
  - "Proterokinetic" inflection in "einem früheren Stadium" (= pre-PIE), determined by internal reconstruction.

Q5: Compositional vs. paradigmatic models

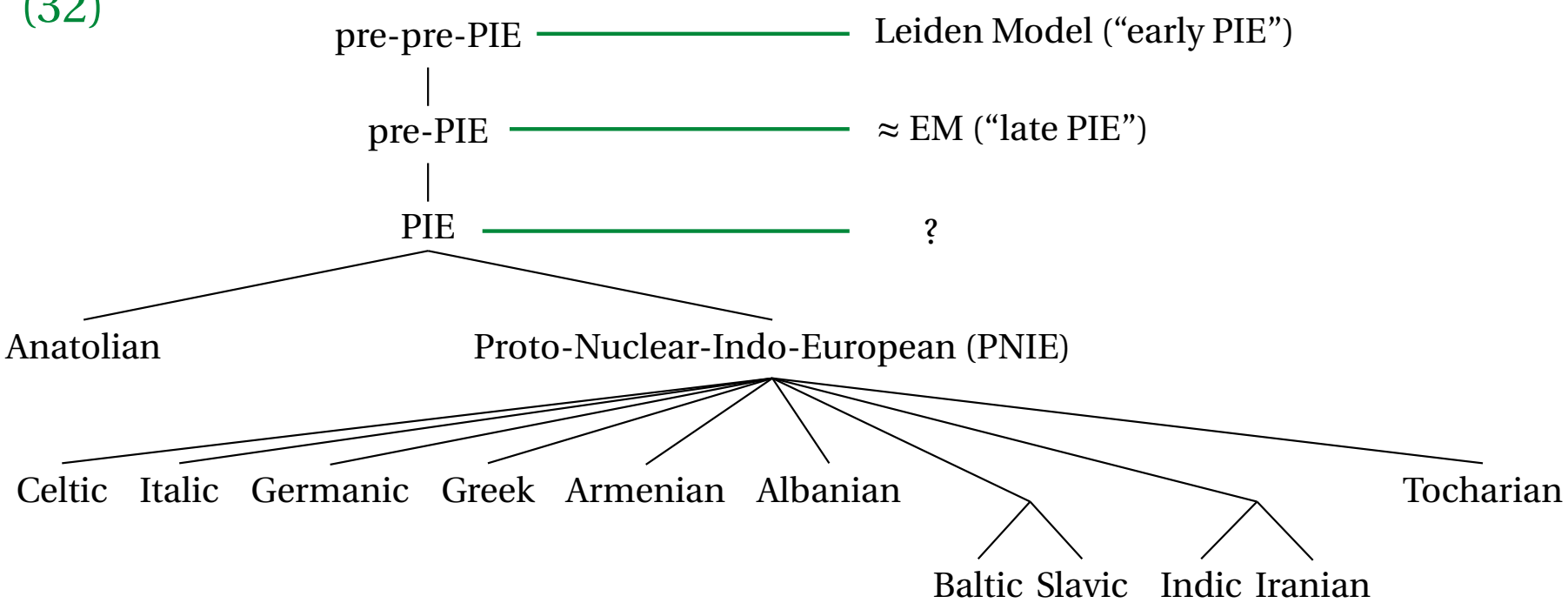
(32)



- Some chronological implications of Schindler's (1975) analysis:
  - Stage at which all and only inflectional patterns reconstructed by EM obtained in athematic nominal inflection was pre-PIE.
  - Different inflectional patterns obtained in PIE — exactly what and how many is an open question, outside scope of EM proper.

Q5: Compositional vs. paradigmatic models

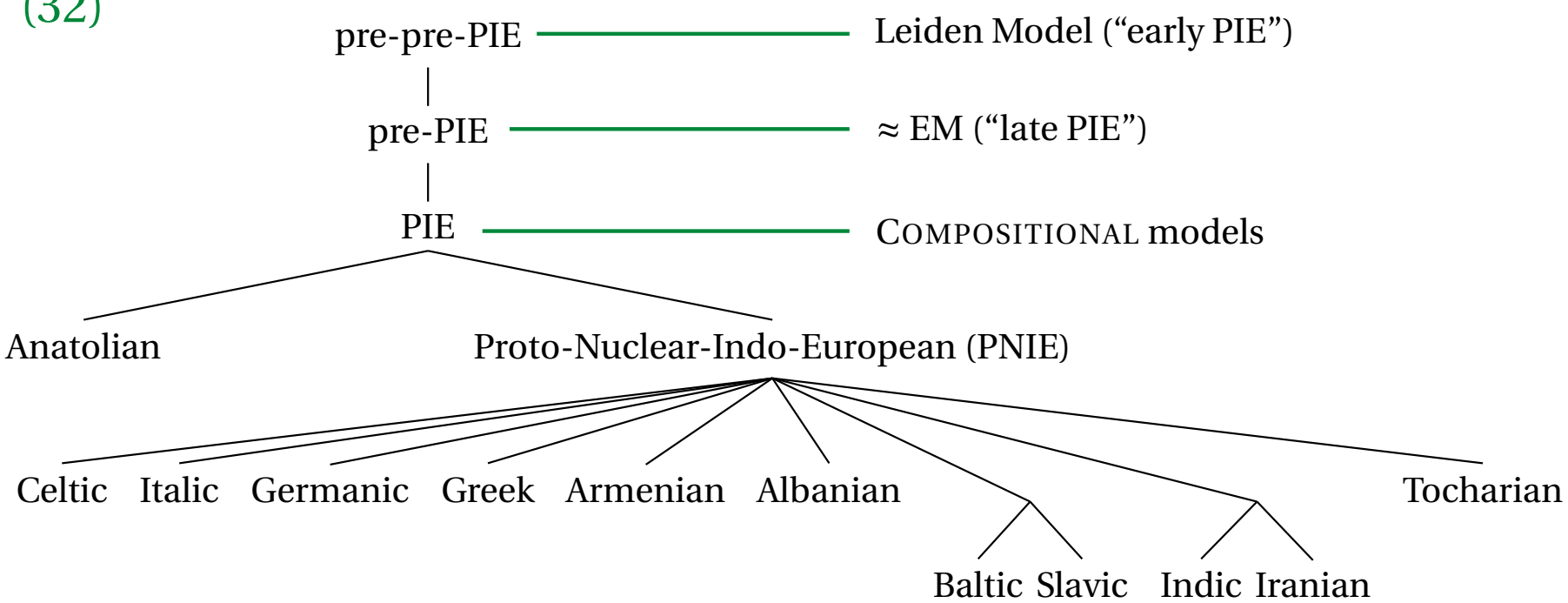
(32)



- Kloekhorst (2013:124) argues that:
  - EM’s reconstruction is broadly correct (i.e., ± certain inflectional patterns), “describes state of affairs in late Proto-Indo-European”.
  - Leiden Model accounts for athematic nominal inflection in “early Proto-Indo-European” (⇒ pre-pre-PIE).

Q5: Compositional vs. paradigmatic models

(32)



- COMPOSITIONAL models **target** synchronic PIE, aiming to:
  - Determine what word-prosodic patterns obtained in PIE, in athematic nominal inflection and elsewhere.
  - Derive these patterns from a common set of morphophonological principles.

Q5: Compositional vs. paradigmatic models

- PARADIGMATIC and COMPOSITIONAL models differ in their **tools**.
- No general agreement about how EM's inflectional classes should be analyzed synchronically.
  - One possibility — Semitic-like morphophonological templates (Fellner and Grestenberger 2016; cf. Pooth 2004).

Q5: Compositional vs. paradigmatic models

- PARADIGMATIC and COMPOSITIONAL models differ in their **tools**.
- COMPOSITIONAL models account for word stress using a basic generative toolkit that has been insightfully applied to LEXICAL ACCENT systems in a diverse set of IE and non-IE languages — e.g.:
  - Vedic Sanskrit (Kiparsky and Halle 1977, Kiparsky 1982, 1984, et seq.)
  - Ancient Greek (Steriade 1988; Probert 2006b, i.a.)
  - Modern Greek (Revithiadou 1999, i.a.).
  - Lithuanian (Blevins 1993; Petit 2018, i.a.)
  - Russian (Garde 1976; Melvold 1989; Halle 1997; Lavitskaya 2015)
  - Japanese (Poser 1984; Idsardi 1992; Kubozono 2011; Kawahara 2015, i.a.)
  - Turkish (Inkelas 1999; Özçelik 2014, i.a.)
  - Chamorro (Chung 1983).
  - Nez Perce (Crook 1999; Kiparsky 2021, i.a.)
  - Cupeño (Hill and Hill 1968; Alderete 2001; Yates 2017b)
  - ...

(see Bogomolets 2020)

Q5: Compositional vs. paradigmatic models

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- COMPOSITIONAL models account for word stress using a basic generative toolkit that has been insightfully applied to LEXICAL ACCENT systems in a diverse set of IE and non-IE languages.
- At the core of this toolkit:
  - A lexical contrast between stress-preferring (ACCENTED) and stress-neutral (UNACCENTED) morphemes.
  - Morphophonological principle(s) that determine which of several accented morphemes receive stress, or in their absence, assign stress to a phonologically preferred position.

Q5: Compositional vs. paradigmatic models

- PARADIGMATIC and COMPOSITIONAL models differ in their **tools**.
- COMPOSITIONAL models then derive (quantitative) ablaut via phonological processes conditioned by stress assignment:
  - Deletion of non-high vowels before accented/stressed vowels (Kiparsky 2010, Yates 2019a).
  - Mora deletion before accented vowels (Kiparsky 2018; Yates 2021a).
  - Post-tonic */o/-deletion (Yates 2019b).
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  - Post-tonic */o/-deletion (Yates 2019b).
  - ?

⇒ Strength of COMPOSITIONAL model is that it draws generalizations that obtain across morphological categories.

Q5: Compositional vs. paradigmatic models

(33)

	STRONG	WEAK	ADJECTIVE	
a.	*gā́v-as*	*gā́v-ā*	*gó-mant-am*	'cow'
b.	*mánas*	*mánas-as*	*mánas-vān*	'thought'
c.	*marút-as*	*marút-su*	*marút-vant-am*	'Marut'
d.	*havís*	*haviṣ́-ā*	*haviṣ́-mant-am*	'offering'
e.	*pā́d-am*	*pad-ā́*	*pad-vánt-am*	'foot'
f.	*dyā́v-as*	*div-ás*	*dyu-mánt-am*	'sky'

- Vedic has an inflectional contrast between nominal stems with IMMOBILE stem stress like (33a–d) and with MOBILE stress like (33e–g).
- Inflectional mobility strongly correlates with stress in derived adjectives with *–mant–* / *–vant–*:
  - Immobile ⇒ stress on same σ of base.
  - Mobile ⇒ stress on adjectival suffix.

Q5: Compositional vs. paradigmatic models

(34)

	STRONG	WEAK	PTCP	IPFV	
a.	*wekzi* [wéːk-t͡si]	*wekanzi* [wéːk-ant͡si]	*wekantan* [wéːk-ant-an]	*wekiškezzi* [wéːk-iskːe-t͡si]	‘demand’
b.	*ānši* [áːns-i]	*ānšanzi* [áːns-ant͡si]	*ānšanteš* [áːns-ant-es]	*ānšikezzi* [áːn-sikːe-t͡si]	‘wipe’
c.	*kuērzi* [kʷéːr-t͡si]	*kuranzi* [kʷor-ánt͡si]	*kurān* [kʷor-áːn]	*kuraškezzi* [kʷor-skːé-t͡si]	‘cut’
d.	*dāi* [táː-i]	*tumēni* [to-méːni]	*dānteš* [t-áːnt-es]	*daškēwen*[*i*] [ta-skːéː-weni]	‘place’

- Hittite has an inflectional contrast between verbal stems with IMMOBILE stem stress like (34a–b) and with MOBILE stress like (34c–d).
- Inflectional mobility predicts stress in imperfectives and participles:
  - Immobile ⇒ stress on same σ of base.
  - Mobile ⇒ stress on participle/imperfective suffix.

Q5: Compositional vs. paradigmatic models

- Hittite and Vedic speakers must have been aware of such implicational relationships between inflectional stress and other derived categories.

Q5: Compositional vs. paradigmatic models

- Hittite and Vedic speakers must have been aware of such implicational relationships between inflectional stress and other derived categories.
- These Vedic and Hittite stress patterns can all be accounted for via:
  - A lexical contrast between stress-preferring (ACCENTED) and stress-neutral (UNACCENTED) morphemes.
  - A phonological preference for the single stress-bearing syllable to coincide with the word's left edge

Q5: Compositional vs. paradigmatic models

(35) **BASIC ACCENTUATION PRINCIPLE (BAP)**:
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.

- Hittite and Vedic speakers must have been aware of such implicational relationships between inflectional stress and other derived categories.
- These Vedic and Hittite stress patterns can all be accounted for via:
  - A lexical contrast between stress-preferring (ACCENTED) and stress-neutral (UNACCENTED) morphemes.
  - A phonological preference for the single stress-bearing syllable to coincide with the word's left edge — i.e., Kiparsky and Halle's (1977) BASIC ACCENTUATION PRINCIPLE in (35).
- Convergent properties of Hittite and Vedic are in all likelihood reconstructible for PIE (cf. Kiparsky 2010; Yates 2017b).

Q5: Compositional vs. paradigmatic models

(36) Unaccented stem + unaccented "strong" ending ⇒ default leftmost:

a. Hitt. /kʷer-t͡si/ → [kʷéːr-t͡si] *kuērzi* 'cuts' (cut-3SG.NPST.ACT)

b. Hitt. /ta-i/ → [táː-i] *dāi* 'takes' (take-3SG.NPST.ACT)

(37) Unaccented stem + accented "weak" ending ⇒ ending attracts stress:

a. Hitt. /kʷer-ántsi/ → [kʷor-ánt͡si] *kuranzi* 'they cut' (cut-3PL.NPST.ACT)

b. Hitt. /ta-wéni/ → [to-méːni] *tumēni* 'we take' (take-1SG.NPST.ACT)

- Hittite prosodic contrast in verbal inflection emerges from contrast in stem accentedness.
  - MOBILE stems are lexically unaccented.
  - IMMMOBILE stems are lexically accented.

Q5: Compositional vs. paradigmatic models

(38) Accented stem + unaccented "strong" ending ⇒ stem attracts stress:

a. Hitt. /wék-mi/ → [wéːk-mi] *wēkmi* 'I demand' (demand-1SG.NPST.ACT)

b. Hitt. /áns-i/ → [áːns-i] *ānši* 'wipes' (wipe-3SG.NPST.ACT)

(39) Accented stem + accented "weak" ending ⇒ leftmost accented wins:

a. Hitt. /wék-ántsi/ → [wéːk-antsi] *wekanzi* 'they demand' (demand-3PL.NPST.ACT)

b. Hitt. /áns-ántsi/ → [áːns-antsi] *ānšanzi* 'they wipe' (wipe-3PL.NPST.ACT)

- Hittite prosodic contrast in verbal inflection emerges from contrast in stem accentedness.
  - MOBILE stems are lexically unaccented.
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Q5: Compositional vs. paradigmatic models

(40) a. Hitt. /kʷer-skːé-t͡si/ → [kʷor-skːéː-t͡si] *kuraškezzi* ‘cuts’
b. Hitt. /ta-skːé-wéni/ → [ta-skːéː-weni] *daškēwen*[*i*] ‘we take’

(41) a. Hitt. /wék-skːé-t͡si/ → [wéːki-skːe-t͡si] *wekiškezzi* ‘demands’
b. Hitt. /áns-skːé-t͡si/ → [áːns-iskːe-t͡si] *ānšiškezzi* ‘wipes’

- BAP likewise predicts correlation between stress mobility in inflection and stress in *–ške*-imperfectives (and participles).
  - Unaccented stems in (40) cede stress to accented IPFV suffix (/-skːé-/).
  - Accented stems retain in (41) stress in context of IPFV suffix.

Q5: Compositional vs. paradigmatic models

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(41) a. Hitt. /wék-skːé-t͡si/ → [wéːki-skːe-t͡si] *wekiškezzi* ‘demands’
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- BAP likewise predicts correlation between stress mobility in inflection and stress in *–ške*-imperfectives (and participles).
  - Unaccented stems in (40) cede stress to accented IPFV suffix (/-skːé-/).
  - Accented stems retain in (41) stress in context of IPFV suffix.
- Both (40a) and (41b) are demonstrably inner-Hittite imperfective formations, replacing older *kuwarške–* and *ānšike–* with same stress pattern (cf. Kloekhorst 2007, Yates 2017b:121 n. 30, 149–50, 2021b).

  ⇒ Stable prosodic contrast between (40a) and (41b) testifies to continued operation of BAP in Hittite.

Q5: Compositional vs. paradigmatic models

(42) Unaccented stem + unaccented ending ⇒ default leftmost stress:

a. Ved. /pad-am/ → *pā́d-am* ‘foot’ (foot-ACC.SG)

b. Ved. /pumas-am/ → *púmāṃs-am* ‘male’ (path-ACC.SG)

(43) Unaccented stem + accented ending ⇒ ending attracts stress:

a. Ved. /pad-á́/ → *pad-á́* ‘with the foot’ (foot-INS.SG)

b. Ved. /pumas-sú/ → *puṃ-sú* ‘among males’ (male-LOC.PL)

- Vedic IMMOBILE and MOBILE stems likewise contrast in accentedness.
  - MOBILE stems are lexically unaccented.
  - IMMMOBILE stems are lexically accented.

Q5: Compositional vs. paradigmatic models

(44) Accented stem + unaccented ending ⇒ stem attracts stress:

a. Ved. /gáv-as/ → *gā́v-as* ‘cows’ (cow-NOM.PL)

b. Ved. /marút-as/ → *marút-as* ‘Maruts’ (Marut-NOM.PL)

(45) Accented stem + accented ending ⇒ leftmost accented (=stem) wins:

a. Ved. /gáv-ā́/ → *gáv-ā* ‘with the cow’ (cow-INS.SG)

b. Ved. /marút-sú/ → *marút-su* ‘among the Maruts’ (Marut-LOC.PL)

- Vedic IMMOBILE and MOBILE stems contrast in accentedness.
  - MOBILE stems are lexically unaccented.
  - IMMOBILE stems are lexically accented.

Q5: Compositional vs. paradigmatic models

(46) Unaccented stem + accented ADJ suffix ⇒ suffix attracts stress:

a. Ved. /pad-vánt-am/ → *pad-vánt-am* 'possessing feet'

b. Ved. /dyav-mánt-am/ → *dyu-mánt-am* 'heavenly'

(47) Accented stem + accented ADJ suffix ⇒ leftmost wins:

a. Ved. /gáv-mánt-am/ → *gó-mant-am* 'possessing cows'

b. Ved. /marút-vánt-am/ → *marút-vant-am* 'consisting of Maruts'

- BAP likewise predicts correlation between stress mobility in inflection and stress in *–mant–* / *–vant–* adjectives.

Q5: Compositional vs. paradigmatic models

- Reconstructing the BAP for PIE makes predictions about the possible set of **regular** stress patterns that obtain in athematic nominal inflection at that stage:
  - "Acrostatic" ✓
  - "Hysterokinetic" ✓ (via "secondary mobility")
  - "Amphikinetic" ✓ (w/o "Oxytone Rule")
  - "Proterokinetic" (X)
- The (at best) sparse evidence for PK-type stress mobility in IE languages is consistent with this prediction (cf. Keydana 2013; Kümmel 2014; Lundquist 2015; Yates 2017a).

Q5: Compositional vs. paradigmatic models

(48) a. Ved. *sā́n-u* : *sn-ú-ṣu* (back-NML.N-NOM.SG/LOC.PL)

b. Hitt. *paḫḫur* : *paḫḫwenaš* (fire-NML.N-NOM/GEN.SG)

[páχʷːr-or] : [paχʷːréːn-as]

- BAP allows "proterokinetic" mobility only under special conditions:
  - When the root σ is eliminated (via "secondary mobility") — e.g., (48a).
  - In suppletive inflectional classes (i.e., heteroclites) — e.g., (48b).

Q5: Compositional vs. paradigmatic models

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⇒ PK-type mobility is predicted (?) only where it is actually attested.

Q5: Compositional vs. paradigmatic models

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- BAP allows "proterokinetic" mobility only under special conditions:
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  - In suppletive inflectional classes (i.e., heteroclites) — e.g., (48b).

⇒ PK-type mobility is predicted (?) only where it is actually attested.

- If correct, non-existence of PK mobility under other conditions at the PIE stage calls into question whether it existed at an earlier stage.

Q5: Compositional vs. paradigmatic models

- Broad take-away — two possible research goals going forward:
  - (i) A better understanding of the diachronic prosodic development of IE languages (and in turn, their implications for language change)
  - (ii) An explanation of how reconstructible PIE word-prosodic patterns took their shape (e.g., origin of **o*-grades).
- Either way, the foundation should be a maximally precise understanding of:
  - Word stress patterns that obtained across categories in synchronic PIE.
  - The principles by which these stress patterns were determined.
  - Synchronic relationship between word stress and ablaut.
- This is the goal of COMPOSITIONAL analyses, whose basic toolkit and working (!) hypotheses offer a **starting point** for philological reassessment and linguistic analysis.

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Re-reconstructing PIE *–*oi*-stems

(A1)	PRIMARY	NON-PRIMARY
NOM.SG	*R(∅)-*ói*	*STEM-*ói*
GEN.SG	*R(∅)-*y*-*é/ós*	*STEM-*y*-*é/ós*

- New morphophonological reconstruction of PIE animate *–*oi*-stems (Yates 2019c) — key features:
  - All have suffixal stress in strong cases shifting to endings in weak.
  - Primary derivatives exhibit zero-grade of the root.
  - Non-primary derivatives "inherit" the vocalism of their base (zero-grade of base-final suffix).

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  - All have suffixal stress in strong cases shifting to endings in weak.
  - Primary derivatives exhibit zero-grade of the root.
  - Non-primary derivatives "inherit" the vocalism of their base (zero-grade of base-final suffix).
- Morphologically and phonologically, (A1) better accounts for attested reflexes of PIE *–*oi*-stems than AK reconstruction.

Non-primary *–*oi*-stems in Hittite

- Hittite attests at least one clear reflex of a primary *–*oi*-stem with zero-grade root — i.e., (27).

(27)	PIE		HITTITE		
NOM.SG	*h_2w̥rt-ói	>	ḫurdāiš	[χ$^{(w)}$ort:-á:i-s]	‘curse’
GEN.SG	*h_2w̥rt-y-é/ós	>	ḫurdiyaš	[χ$^{(w)}$ort:-y-á:s]	‘of the curse’

- *ḫurd(a)i–* in (27) shows same weak root allomorphy (= zero-grade) seen, e.g., in 3PL.IMP.ACT *ḫurtandu*, IPFV *ḫurz(aš)ke–* (cf. 1SG.NPST.ACT *ḫuwartaḫḫi*).

Non-primary *–*oi*-stems in Hittite

- Unambiguously non-primary *–*oi*-stems occur in Hittite — e.g., (28):

(28)

	BASE			*–*oi*-stem	
a.	*ištarni(n)k–*	‘make ill’	⇒	*ištarningain* [istarniŋk-á꞉i-n]	‘illness’
b.	*maniyaḫḫ–*	‘administer’	⇒	[*man*]*iyaḫḫāiš* [maniy-aχ꞉-á꞉i-s]	‘administrative district’
c.	*ḫullant–*	‘defeated’	⇒	*ḫullanzāiš* [χol꞉ant͡s-á꞉i-s]	‘defeat’
d.	*ḫukma–**	‘magical’[?]	⇒	*ḫukmain* [χ$^{(w)}$okm-á꞉i-n]	‘incantation’

- Analysis correctly predicts that non-primary *–*oi*-stem (i) has suffixal stress in strong cases and (ii) preserves stem shape of base.

Non-primary *–*oi*-stems in Greek

- Unambiguously non-primary *–*oi*-stems occur in Greek — e.g., (29):

(29)

	BASE			*–*oi*-stem	
a.	χρή	'need to'	⇒	χρε(ι)ώ	'need'
b.	μέλλω	'be about to'	⇒	μελλοῦς	'of hesitation'
c.	κάμῑνος	'furnace'	⇒	καμῑνώ	'furnace-woman'
d.	κῦμα	'wave'	⇒	Κυμώ	'Cymo (PN) '
e.	ἐρατός	'lovely'	⇒	Ἐρατώ	'Erato (nymph)'
f.	κάλλιστος	'prettiest'	⇒	Καλλιστώ	'Callisto (nymph)'
g.	κόσμος	'order'	⇒	Κοσμώ	'Cosmo (priestess)'

- Analysis correctly predicts that non-primary *–*oi*-stem (i) has suffixal stress in strong cases and (ii) preserves stem shape of base.

Non-primary *–*oi*-stems in Greek

- Root full-grades in (30) are often taken as evidence for erstwhile root stress, as expected in the strong stem of a primary AK paradigm (Rix 1992:146–7, Weiss 2020:259, *i.a.*).

(30)

	BASE			*–*oi*-stem	
a.	φείδομαι	‘spare’	⇒	φειδώ	‘sparing’
b.	πείθω	‘persuade’	⇒	πειθώ	‘P/persuasion’
c.	λέχομαι	‘lie down’	⇒	λεχώ	‘woman after childbirth’

- But root full-grades in (30) could instead be transferred from their (thematic, root-stressed) verbal bases

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c.	λέχομαι	'lie down'	⇒	λεχώ	'woman after childbirth'

- But root full-grades in (30) could instead be transferred from their (thematic, root-stressed) verbal bases — i.e., (31) in PIE terms:

(31)

PIE	*$b^h eid^h$–	⇒	*$b^h éid^h$-*e/o*–	⇒	*$b^h eid^h$-*ói*-
>			Gk. πείθω 'persuade'		Gk. πειθώ 'persuasion'
>			Lat. *fīdō* 'believe'		

PIE *–*oi*-stems in Vedic

- Lone Indo-Iranian reflex of PIE animate *–*oi*-stems is Ved. *sákhā(y)*– = Av. *haxā(ii)*– ‘friend’.
- Root stress observed in strong cases and zero-grade suffix in weak of Ved. *sákhā(y)*– could in principle reflect an AK paradigm like (32):

(32)	PIE		VEDIC SANSKRIT	
NOM.SG	**sék^{w}h$_2$-ōi*	>	*sákhā*	‘friend’
ACC.SG	**sék^{w}h$_2$-oy-m̥*	>	*sákhāyam*	
DAT.SG	**s(e)k^{w}h$_2$-y-éi*	>>	*sákhye*	‘for a friend’

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ACC.SG	**sék^{w}h$_2$-oy-m̥*	>	*sákhāyam*	
DAT.SG	**s(e)k^{w}h$_2$-y-éi*	>>	*sákhye*	'for a friend'

- But this analysis is morphologically problematic:
  - Root must be PIE **sek^{w}*– 'accompany' (> Ved. *sácate*, Gk. ἕπομαι, Lat. *sequitur*, etc.; cf. *LIV*^{2}: 525–6)
  - But a primary deverbal formation from this root leaves the voiceless aspirate (Ved. *kh*, Av. *x* < **k$^{(w)}$h$_2$*) unexplained.

PIE *–*oi*-stems in Vedic

- Schindler (1969:154[65]) thus proposes Ved. *sákha*— is derived as in (34) — i.e., a non-primary denominal derivative like Ved. *rátha*– in (33):

(33) PIE **ret–* ‘run’ ⇒ **rot-eh$_2$* ‘wheels of a vehicle’ ⇒ **rot-h$_2$-o–* ‘wheeled vehicle’
> Lat. *rota* ‘wheel’
> Ved. *rátha–* ‘chariot’

(34) PIE **sek^w–* ‘accompany’ ⇒ **sok^w-eh$_2$* ‘retinue’ ⇒ **sok^w-h$_2$-oi–* ‘member of retinue’
> (Gk. ὀπά-ων) ‘comrade’
> Ved. *sákhā(y)–* ‘friend’

- Non-primary derivatives “inherit” root **o*-grade of the base, as expected on the proposed analysis.
  - Further derivatives of Ved. *sákhā(y)–* (e.g., Lat. *socius* ‘comrade’, Gk. ἀοσσέω ‘help’) add support for root **o*-vocalism (cf. Byrd 2015:210–11, Ringe 2017:131–2).

Reassessing PIE *–*oi*-stems in Vedic

- Broad-take away from Schindler's (1969) analysis — Ved. *sákhā(y)*– does not directly reflect a PIE AK paradigm.
  - Even if did continue **sók^{w}-h_2-oi–*/**sok^{w}-h_2-y-´* with edge-to-edge stress mobility (= "amphikinetic"?), it does not show **e*/∅ root ablaut and is not a primary derivative.

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- But the Vedic stress pattern also mismatches the pre-form predicted by the alternative reconstruction, **sok^{w}-h$_2$-ói–*/**sok^{w}-h$_2$-y-´*

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- But the Vedic stress pattern also mismatches the pre-form predicted by the alternative reconstruction, **sok^{w}-h$_2$-ói–/*sok^{w}-h$_2$-y-´*
  - Can this divergence be explained as an innovation?

Reassessing PIE *–*oi*-stems in Vedic

- Word-initial stress is the "default" prosodic pattern in Vedic (= BAP) and thus tends to emerge diachronically — e.g., as an inner-Vedic development in PIE *–*ti*-stems like (35) (see Lundquist 2015).

(35) PIE *$m\underset{\circ}{n}$-*tí*– > RV *matí*– 'thought' > post-RV *máti*– 'id.'

- Same "emergence of default" would account for stress shift in (36).

(36) PIE *sok^w-h_2-*ói*- > RV *sákhā(y)*– 'friend'

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- Same "emergence of default" would account for stress shift in (36).

(36) PIE *sok^w-h_2-*ói*- > RV *sákhā(y)*– 'friend'

- A potential prosodic archaism preserved in BV compound in (37):

(37) PIE */$h_1$su-sok^w$h_2$ói-es/ → *[$h_1$su-sok^wh_2-óy-es]
> Ved. *su-ṣakhā́yas* 'having good fellowship'

- See Probert 2006a,b and Yates 2015 on similar changes in Greek and Anatolian; for BV compounds with 1M *$h_1$su*– stressed on accented σ of 2M see Lundquist 2016.

Summary: reconstructing PIE animate *–*oi*-stems

(26)	PRIMARY	NON-PRIMARY
NOM.SG	*R(∅)-*ói*	*STEM-*ói*
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- Prosodic reconstruction of PIE animate *–*oi*-stems in (26) fits the IE data well, with both primary and non-primary paradigms directly continued in Hittite.
- Minimal innovations needed to account for non-primary paradigms in Vedic and Greek:
  - Elimination of intraparadigmatic stem ablaut in Greek.
  - Emergence of "default" initial stress in Vedic.

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  - Emergence of "default" initial stress in Vedic.

⇒ PIE animate *–*oi*-stems are securely reconstructible with suffixal **o*-vocalism and stress alternations between suffix and endings.

The BAP in Hittite — nominal inflection

		STRONG		WEAK	
(A1)	a.	MU-*za* [wíːt͡s-s]	:	*wītti* [wíːtː-i]	(year-C.NOM/DAT/LOC.SG)
	b.	*ḫāranan* [χáːran-an]	:	*ḫāranas* [χáːran-as]	(eagle-C.ACC/GEN.SG)
(A2)	a.	*pātu*[*š*] [páːt-os]	:	*patān* [pat-áːn]	(foot-C.ACC/GEN.PL)
	b.	*tēkan* [téːkan-∅]	:	*taknāš* [takn-áːs]	(earth-N.ACC/GEN.SG)

- Hittite has same prosodic contrast recurs in nominal inflection:
  - IMMOBILE: stress fixed on stem throughout inflectional paradigm.
  - MOBILE: stress alternates between stem in the "strong" cases (NOM, ACC), and inflectional endings in the other "weak" cases.

The BAP in Hittite — nominal inflection

(A3)	a.	Hitt. /tekan-∅/	→	[téːkan] *tēkan*	‘earth’ (earth-N.NOM/ACC.SG)
	b.	Hitt. /tekan-ás/	→	[takn-áːs] *taknāš*	‘of the earth’ (earth-GEN.SG)
	c.	Hitt. /χáran-ás/		[χáːran-as] *ḫāranaš*	‘of the eagle’ (eagle-GEN.SG)

- Nominal IMMOBILE vs. MOBILE contrast can be analyzed in same way:
  - Unaccented stem + unaccented ending ⇒ default leftmost, e.g., (A3a).
  - Unaccented stem + accented ending ⇒ attraction to ending, e.g., (A3b).
  - Accented stem + accented ending ⇒ leftmost accented wins, e.g., (A3c).

Reconstructing PIE stress assignment

- Common critique of BAP and other aspects of Kiparsky's analyses — works well for Vedic, but that doesn't mean it works for PIE; see esp. Jasanoff (2017:27–8):

  "The advantages of a compositional account of the synchronic accent systems of Vedic, Greek, and above all Balta-Slavic, are accepted as well…[B]ut…the compositional model is unlikely to work as well for PIE as it works for the daughter languages. And indeed, Kiparsky's vision of PIE is rather suspiciously Vedic-like."

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  - So — **is there sufficient evidence to reconstruct the BAP for PIE?**

The BAP in PIE?

- “Default” phonological stress assignment in Greek is not the BAP, but rather “recessive accentuation” (see Probert 2006b:128–44).
  - “Recessive accentuation” may historically derive from BAP after the emergence of “Law of Limitation” (≈ leftmost within the stress domain; cf. Yates 2015:180, Lundquist and Yates 2018:2136).
  - But it does not provide an exact analogue.

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  - But it does not provide an exact analogue.
- Anatolian provides direct evidence for the BAP:
  - Historical traces in Hittite, Luwian, and Palaic (Yates 2015).
  - Synchronically operative in Hittite (likely also Palaic; Yates 2016b, 2017b).
    - Strongest evidence comes from verbal inflection (where Greek is uninformative).

How to fix Hittite ablaut

(A1)		PRE-PA	
a.	3SG	*$nóh_2$-*ei*	‘frightens’
	3PL	*$n̥h_2$-*énti*	‘they frighten’
b.	3SG	*$sóh_2$-*ei*	‘clogs, fills up’
	3PL	*sh_2-*énti*	‘they clog, fill up’
c.	3SG	*$lóg^h$-*ei*	‘knocks out, bends’
	PTCP	*$l̥\hat{g}^h$-*ónt*	‘bent’
d.	3SG	*$wóh_2\hat{g}$-*ei*	‘bites’
	3PL	*$uh_2\hat{g}$-*énti*	‘they bite’
e.	3SG	*$nó\hat{k}$-*ei*	‘dies’
	3PL	*$n̥\hat{k}$-*énti*	‘they die’

- Regular morphological “fix” for irregular intraparadigmatic is leveling or weak *a*-vocalism.
- Already in PA stress mobility introduced into PL.NPST.ACT of most verbs in this category (cf. Melchert 2013), yielding **o*/∅ alternations.

How to fix Hittite ablaut

(A1)		Pre-PA		Hittite	
a.	3sg	*nóh$_2$-ei	>	nāḫi	‘frightens’
	3pl	*nh$_2$-énti	⁝>	xaḫḫanzi	‘they frighten’
b.	3sg	*sóh$_2$-ei	>	šāḫi	‘clogs, fills up’
	3pl	*sh$_2$-énti	⁝>	xišḫanzi	‘they clog, fill up’
c.	3sg	*lóg^h-ei	>	lāki	‘knocks out, bends’
	ptcp	*lg^h-ónt	⁝>	xalgān	‘bent’
d.	3sg	*wóh$_2$ĝ-ei	>	wāki	‘bites’
	3pl	*uh$_2$ĝ-énti	⁝>	xukanzi	‘they bite’
e.	3sg	*nók̂-ei	⁝>	xnākki	‘dies’
	3pl	*nk̂-énti	>	akkanzi	‘they die’

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- Expected Hittite outcomes of these verbs would show initial onset alternations in strong vs. weak contexts.

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(56)	PRE-PA			HITTITE	
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	3PL	*sh$_2$-énti	⁝>	xišḫanzi	‘they clog, fill up’
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- Regular morphological “fix” for irregular intraparadigmatic is leveling or weak *a*-vocalism.
- But attested Hittite outcomes show analogical development of weak *a*-vocalism.

Morphophonological change via paradigm uniformity

- Independent Hittite evidence for OUC comes from ahistorically non-alternating radical *ḫi*-verb paradigms (cf. Melchert 2012).
- Expected Hittite outcomes of these verbs would show initial onset alternations in strong vs. weak contexts:

(56)

		PRE-PA		HITTITE	
a.	3SG	**nóh₂-ei*	>	*nāḫi*	'frightens'
	3PL	**n̥h₂-énti*	⋟	*ˣaḫḫanzi*	'they frighten'
b.	3SG	**sóh₂-ei*	>	*šāḫi*	'clogs, fills up'
	3PL	**sh₂-énti*	⋟	*ˣišḫanzi*	'they clog, fill up'
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Morphophonological change via paradigm uniformity

- Independent Hittite evidence for OUC comes from ahistorically non-alternating radical *ḫi*-verb paradigms (cf. Melchert 2012).
- But attested Hittite outcomes show analogical changes that bring verbs into compliance with OUC:

(57)

		PRE-PA		HITTITE	EXPECTED
a.	3SG	**nóh₂-ei*	>	*nāḫi*	
	3PL	**n̥h₂-énti*	>>	*naḫḫanzi*	x*aḫḫanzi*
b.	3SG	**sóh₂-ei*	>	*šāḫi*	
	3PL	**sh₂-énti*	>>	*šaḫḫanzi*	x*išḫanzi*
c.	3SG	**lógʰ-ei*	>	*lāki*	
	PTCP	**l̥g̑ʰ-ónt*	>>	*lagān*	x*algān*
d.	3SG	**wóh₂ĝ-ei*	>	*wāki*	
	3PL	**uh₂ĝ-énti*	>>	*wakkanzi*	x*ukanzi*
e.	3SG	**nók̂-ei*	>>	*aki*	x*nākki*
	3PL	**n̥k̂-énti*	>	*akkanzi*	