

Cyclicity in Indo-European non-primary derivation

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Primary vs. non-primary derivation in Indo-European

(1) *Primary vs. non-primary derivation in IE:*

a. PRIMARY: **Root + Suffix₁ + Ending**

b. NON-PRIMARY: **Root + Suffix₁ + Suffix₂ (+ Suffix₃ ...) + Ending**

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 - ▶ PRIMARY derivatives in (1a) consist of a root, exactly one (overt) derivational suffix, and an inflectional ending.
 - ▶ NON-PRIMARY (“secondary”) derivatives in (1b) contain multiple derivational suffixes.

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▶ Compare, e.g., primary (2a) with its non-primary derivative (2b):

- (2) a. Ved. *śrāv-as-ā* (hear-N.NML-INS.SG) ‘with fame’
b. ⇒ *śrav-as-yá-ti* (hear-N.NML-VBL-3SG.PRS.ACT) ‘seeks fame’

Morphophonology of IE (non-)primary derivatives

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- ▶ Distinction in (1) has shaped study of morphophonology of Proto-Indo-European (PIE) and its daughters — in particular, of the relationship between:
 - ▶ STRESS: single word-level prosodic peak (“accent”), which was phonologically unpredictable and contrastive in PIE.
 - ▶ ABLAUT: intramorphemic alternations in vowel quantity ($*\bar{V} \sim *V \sim *\emptyset$) or quality ($*e \sim *o$)

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 - ▶ e.g., “Erlangen Model” (EM; Schindler 1967 et seq., Rix 1976/1992) makes explicit claims only about reconstructible stress/ablaut patterns of PRIMARY athematic nominals (= nouns, adjectives).

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- ▶ PIE NON-PRIMARY derivatives — like other categories outside scope of EM (thematic nominals, compounds, verbs, etc.) — have not yet been systematically incorporated into a theory of PIE morphophonology.

Toward a general theory of (P)IE morphophonology

(3) PRETONIC MID VOWEL DELETION (PVD): */e, o/ → ∅ / ___ $\acute{\sigma}$
“*/e, o/ is deleted when it precedes a stressed syllable.” (iterative)

- ▶ Focus for today — operation of (3) in PIE non-primary derivatives.

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- ▶ This phonological process — if reconstructible for PIE (Yates 2019a; cf. Kiparsky 2010) — would be important both as a:
 - ▶ Component of a general theory of PIE morphophonology
 - ▶ An argument why such a general theory is needed.

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 - ▶ **Part 1** will provide evidence that:
 - ▶ (3) applied regularly in PIE primary derivatives and in non-root syllables of non-primary derivatives.
 - ▶ (3) applied variably in root syllables of non-primary derivatives, depending on properties of their base.

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 - ▶ Component of a general theory of PIE morphophonology
 - ▶ An argument why such a general theory is needed.
- ▶ Deletion patterns in non-primary derivatives will be argued to show:
 - ▶ (3) was synchronically operative in PIE.
 - ▶ PIE also had a morphophonological process whereby root vowels were transferred cyclically from base to non-primary derivative.
 - ▶ A general theory of PIE morphophonology is indeed necessary.

Pretonic mid vowel deletion in PIE primary derivatives

- (4) a. */g^{wf̥}en-ti/ → *[g^{wf̥}én-ti] > Ved. *hánti*, Hitt. *kuēnzi* ‘kills’
b. */g^{wf̥}en-énti/ → *[g^{wf̥}n-énti] > Ved. *ghnánti*, Hitt. *kunanzi* ‘kill’
- (5) a. */k^jleu-’os-∅/ → *[k^jléw-os] > Ved. *śrávas*, Gk. κλέος ‘fame’
b. */k^jleu-tó-s/ → *[k^jlu-tó-s] > Ved. *śrutás*, Gk. κλυτός ‘heard’
- (6) a. */dyew-m/ → *[dyé:-m] > Ved. *dyám* ‘sky’, Gk. Ζῆν ‘Zeus’
b. */dyew-ós/ → *[diw-ós] > Ved. *divás*, Gk. Διός ‘of ’’

► Robust IE evidence that PIE mid vowels (* /e, o/) were regularly subject to deletion in pretonic syllables.

► Root */e/ in (e.g.) (4–6) — stressed in (a) vs. **deleted** in (b).

Pretonic mid vowel deletion in PIE primary derivatives

- (7) a. */ph₂tér-m/ → *[pəh₂tér-m] > Ved. *pitáram*, Gk. πατέρα ‘father’
b. */ph₂tér-éi/ → *[pəh₂tr-éi] > Ved. *pitré* (cf. Gk. πατρί) ‘to/for’
- (8) a. */h₂uksén-es/ → *[h₂uksén-es] > Ved. *ukṣáṇas* ‘oxen’
b. */h₂uksén-ós/ → *[h₂uksn-ós] > Ved. *ukṣṇás* ‘of the ox’
- (9) a. */yeu-né-g-ti/ → *[yu-né-k-ti] > Ved. *yunákti* ‘yokes’
b. */yeu-né-g-énti/ → *[yu-n-g-énti] > Ved. *yuñjánti* ‘yoke’

- ▶ Robust IE evidence that PIE mid vowels (* /e, o/) were regularly subject to deletion in pretonic syllables.
 - ▶ Stem-final */e/ in (e.g.) (7–9) — stressed in (a) vs. **deleted** in (b).

Pretonic mid vowel deletion in PIE primary derivatives

- (10) a. */pentoh₂-es/ → *[pénton₂-as] >> Ved. *pánthās* ‘paths’
(cf. YAv. *paṇṭam* ‘path’)
- b. */pentoh₂-ós/ → *[pñ₂th₂-ós] > Ved. *pathás* ‘of the path’
OAv. *paθō* ‘of the path’
- (11) a. */d^heg^{j^h}om-s/ → *[d^hég^{j^h}o:m] > Hitt. *tēkan* ‘earth’
- b. */d^heg^{j^h}om-ós/ → *[d^həg^{j^h}m-ós] > Hitt. *taknāš* ‘of the earth’

► Robust IE evidence that PIE mid vowels (* /e, o/) were regularly subject to deletion in pretonic syllables.

► Stem-final */o/ in (e.g.) (10–11) — **surfaces** in (a) vs. **deleted** in (b).

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- ▶ Stem-final */o/ in (e.g.) (10–11) — surfaces in (a) vs. deleted in (b).
- ▶ Stem-initial */e/ also in (10–11) — stressed in (a) vs. deleted in (b) — with **iterative** application of deletion.

Pretonic deletion in PIE non-primary derivatives

(12) PIE non-primary derivatives with suffix $* /-ó-$ and their IE reflexes:

- a. PIE $*b^h ud^h -mén-$ ‘bottom’ $\Rightarrow *b^h ud^h -\mu n-ó-$ ‘having a bottom’
> Gk. $\piυθμῆν$ ‘bottom’ Ved. *budhná-*, Lat. *fundus* ‘ground’
- b. PIE $*wét-es-$ ‘year’ $\Rightarrow *wet-s-ó-$ ‘having a year’
> Gk. $\acute{\epsilon}\tau\omicron\varsigma$ ‘year’ Ved. *vatsá-* ‘calf’
- c. PIE $*léuks-men-$ ‘light’ $\Rightarrow *leuks-\mu n-ó-$ ‘having light’
> Lat. *lūmen* ‘light’ YAv. *raoxšna-* ‘bright’
- d. PIE $*(h_1)rot-eh_2-$ ‘wheel’ $\Rightarrow *(h_1)rot-h_2-ó-$ ‘wheeled’
> Lat. *rota* ‘wheel’ Ved. *rátha-*, YAv. *raθa-* ‘chariot’
- e. PIE $*sok^{w}-h_2-ói-$ ‘comrade’ $\Rightarrow *sok^{w}-\mu_2-y-ó-$ ‘having comrades’
> Ved. *sákhā(y)-* ‘friend’ Lat. *socius*, ON *seggr* ‘ally’, ‘warrior’

► Standardly reconstructed PIE non-primary derivatives given in (12).

- (a) EWA II: 228–9, de Vaan (2008:250), Beekes 2010:1255, Weiss (2020:123), i.a.
(b) Stüber (2002:31, 187–8), Schaffner (2004:292–3), Meissner (2005:153 n. 82, 165), i.a.
(c) Schmidt (1895:101–2), Nussbaum (2010:270)
(d) EWA II: 429–30, de Vaan (2008:527), NIL: 575–8, Weiss (2020:126, 320), Meier-Brügger and Fritz (2021:126), i.a.
(e) Schindler (1969:164), EWA II: 684–5, Beekes (2010:112–3, 1089), Byrd (2015:210–1), Ringe (2017:131–2), Yates (2019b), i.a.

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▶ Non-primary derivative in (12a) appears to show same iterative deletion observed in primary derivatives:

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\Rightarrow Both primary and non-primary derivatives provide evidence for (3) as a synchronic, general phonological process in PIE:

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- But in (12b–e) only mid vowel in stem-final suffix of the base undergoes pretonic deletion in non-primary derivative.

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- ▶ But in (12b–e) only mid vowel in stem-final suffix of the base undergoes pretonic deletion in non-primary derivative.
- ▶ Root mid vowel of the base surfaces pretonically in non-primary derivative.

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- Why does deletion fail to apply iteratively to root vowel in (12a–d)?

- ▶ Significant but often overlooked observation of Schindler (1975b:260):

“Es besteht dabei generell die Möglichkeit, dass spezifische Ablautstufen der zugrundeliegenden Primärbildungen auch in den sekundären Ableitungen erscheinen.”

Toward a new account of PIE non-primary derivatives

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- ▶ Two possible interpretations:

- (i) Diachronically, PIE non-primary derivatives tend to be influenced by their bases, and so undergo post-PIE analogical changes to more closely resemble them phonologically.
- (ii) Synchronically, PIE non-primary derivatives “inherit” phonological properties of their primary bases.

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SCHINDLER'S GENERALIZATION:

PIE non-primary derivatives preserve root vocalism of their base.

- ▶ **Proposal:** Building on Schindler (1975b), morphophonological generalization in (14) obtained synchronically in PIE.

Toward a new account of PIE non-primary derivatives

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- ▶ Generalization in (14) accounts for contrast in (12) above:
 - ▶ **Pretonic deletion applies to root vowel** ($*b^h\text{eud}^h-$) in non-primary (12a) because it is not present in base.
 - ▶ **Pretonic deletion underapplies to root vowel** in non-primary (12b) because it is present in base.

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 - ▶ Better accounts for phonological properties of certain IE formations as “covert” non-primary derivatives (i.e., no segmental exponent of S_1).
 - ▶ Deverbal animate **-oi-*stems
 - ▶ Internal derivatives (“*τομός-*type,” **-mon-*stems).

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 - ▶ Analyzable as a CYCLIC effect of cross-linguistically common type.

Overt non-primary *-oi-stems in Greek and Hittite

- ▶ PIE had an animate noun-forming suffix *-oi-, which productively forms unambiguous non-primary derivatives in Greek and Hittite:

(15) Greek non-primary *-oi-stems and their bases:

- κάμινος ‘furnace’ ⇒ καμινῶ ‘furnace-woman’
- μέλλω ‘be about to’ ⇒ μελλοῦς ‘of hesitation’

(16) Hittite non-primary *-oi-stems and their bases:

- hullant-* ‘defeated’ ⇒ *hullanzāiš* ‘defeat’
[χολι:-ά:nt-] [χολι:-a:nts-á:i-s]
- maniyahḫ-* ‘administer’ ⇒ *[man]iyahḫāiš* ‘administrative district’
[maniy-άχ:-] [maniy-aχ:-á:i-s]

- ▶ In both languages *-oi-stems consistently exhibit **suffixal stress** in their strong case forms, hence in PIE too (Yates 2019b).

Covert non-primary **-oi-*-stems in Greek

(17) PIE primary² **-oi-*-stems in Greek:

- a. PIE **b^heid^h-* ‘persuade’ ⇒ **b^heid^h-ói-* ‘persuasion’
> Gk. πειθῶ ‘P/persuasion’
- b. PIE **b^heid-* ‘split’ ⇒ **b^heid-ói-* ‘splitting’
> Gk. φειδῶ ‘sparing’
- c. PIE **leg^h-* ‘lie (down)’ ⇒ *leg^h-ói-* ‘lying down’
Gk. λεχῶ ‘woman post-childbirth’

- ▶ Greek also attests a few **-oi-*-stems that — having just one overt suffix — could reflect PIE primary formations, as in in (17).
- ▶ Yet on this morphological analysis the **failure of root mid vowel to undergo pretonic deletion** is unexpected.

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- ▶ Greek also attests a few **-oi-* stems that — having just one overt suffix — could reflect PIE primary formations, as in (17).
- ▶ Yet on this morphological analysis the **failure of root mid vowel to undergo pretonic deletion** is unexpected.
 - ▶ **Root vocalism** in (17) previously taken by EM as evidence for inherited root stress (“amphikinetic”; Rix 1992:146–7, Weiss 2020:259, *i.a.*), against convergent Hittite and Greek evidence for suffixal stress.

Covert non-primary *-oi-stems in Greek

(18) PIE non-primary deverbal *-oi-stems and their IE reflexes:

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> Gk. πείθω ‘persuade’ Gk. πειθῶ ‘persuasion’
Lat. *fīdō* ‘trust’
- b. PIE **b^héid-e/o-* ‘split’ ⇒ **b^heid-**oi-*** ‘splitting’
> Gk. φείδομαι, ‘spare’ Gk. φειδῶ ‘sparing’
Goth. *beitan* ‘bite’
- c. PIE **lég^h-e/o-* ‘lie (down)’ **leg^h-**oi-*** ‘lying down’
> Gk. λέχομαι, ‘lie (down)’ Gk. λεχῶ ‘woman post-
OIr. *laigid* ‘lie (down)’ childbirth’

- ▶ These *-oi-stems are better analyzed as in (18) — i.e., as covert non-primary derivatives of PIE thematic verbs likewise reflected in Greek.
- ▶ **Accented suffix *-oi-** “replaces” thematic **-e/o-* in base verb (like other *-i-ful suffixes; Schindler 1980:390, Grestenberger 2014:89, i.a.).

Covert non-primary *-oi-stems in Greek

(18) PIE non-primary deverbal *-oi-stems and their IE reflexes:

- a. PIE **b^héid^h-e/o-* ‘persuade’ ⇒ **b^heid^h-oi-* ‘persuasion’
> Gk. πείθω ‘persuade’ Gk. πειθῶ ‘persuasion’
Lat. *fīdō* ‘trust’
- b. PIE **b^héid-e/o-* ‘split’ ⇒ **b^heid-oi-* ‘splitting’
> Gk. φείδομαι, ‘spare’ Gk. φειδῶ ‘sparing’
Goth. *beitan* ‘bite’
- c. PIE **lég^h-e/o-* ‘lie (down)’ ⇒ **leg^h-oi-* ‘lying down’
> Gk. λέχομαι, ‘lie (down)’ Gk. λεχῶ ‘woman post-
OIr. *laigid* ‘lie (down)’ childbirth’

- ▶ These *-oi-stems are better analyzed as in (18) — i.e., as covert non-primary derivatives of PIE thematic verbs likewise reflected in Greek.
- ▶ SCHINDLER’S GENERALIZATION in (14) then accounts for phonologically irregular pretonic root vowel:

(14) PIE non-primary derivatives preserve root vocalism of their base.

(19) PIE *τόμος-* and *τομός-* type nominals and their IE reflexes:

- | | | | | | | |
|----|-----|-----------------------------|----------|---|-----------------------------|------------|
| a. | PIE | <i>*τόmh₁-o-</i> | ‘slice’ | ⇒ | <i>*tomh₁-ó-</i> | ‘cutting’ |
| | > | Gk. <i>τόμος</i> | ‘slice’ | | Gk. <i>τομός</i> | ‘cutting’ |
| b. | PIE | <i>*wólh₁-o-</i> | ‘choice’ | ⇒ | <i>*wolh₁-ó-</i> | ‘choosing’ |
| | > | Ved. <i>vára-</i> | ‘choice’ | | Ved. <i>vará-</i> | ‘suitor’ |
| c. | PIE | <i>*kóuh_x-o-</i> | ‘swell’ | ⇒ | <i>*kouh_x-ó-</i> | ‘swelling’ |
| | > | — (⇒ Sp. <i>cueva</i> | ‘cave’) | | Lat. <i>cavus</i> | ‘hollow’ |

► Broad agreement that PIE had thematic nominal pairs like (19) related by INTERNAL DERIVATION (ID).

- See, e.g., Schaffner (2001:98), Widmer (2004:32), Fortson (2010:122), Nussbaum (2014:243–51, 2017:237–9), Jasanoff (2017:21–2), Lundquist and Yates (2018:2108–9), Weiss 2020:287 (cf. Benveniste 1935, Krasukhin 2000:133–4); on (17c) see Vine (2006:235–7).

(19) PIE *τόμος-* and *τομός-* type nominals and their IE reflexes:

- | | | | | | | |
|----|-----|-----------------------------|----------|---|------------------------------------|------------|
| a. | PIE | <i>*tómh₁-o-</i> | ‘slice’ | ⇒ | <i>*tomh₁-ǵ-</i> | ‘cutting’ |
| | > | Gk. <i>τόμος</i> | ‘slice’ | | Gk. <i>τομός</i> | ‘cutting’ |
| b. | PIE | <i>*wólh₁-o-</i> | ‘choice’ | ⇒ | <i>*wolh₁-ǵ-</i> | ‘choosing’ |
| | > | Ved. <i>vára-</i> | ‘choice’ | | Ved. <i>vará-</i> | ‘suitor’ |
| c. | PIE | <i>*kóuh_x-o-</i> | ‘swell’ | ⇒ | <i>*kouh_x-ǵ-</i> | ‘swelling’ |
| | > | — (⇒ Sp. <i>cueva</i> | ‘cave’) | | Lat. <i>cavus</i> | ‘hollow’ |

- ▶ Broad agreement that PIE had thematic nominal pairs like (19) related by INTERNAL DERIVATION (ID).
 - ▶ ID ≈ derivation marked by changes only in prosodic properties (stress, ablaut); no overt (“external”) affixation.
 - ▶ Derivations in (19) would involve stress shift from root to **stem-final σ** (for possible implementations see Kiparsky 2010, Keydana 2013).

Internal derivatives as covert non-primary derivatives

(19) PIE $\tau\acute{o}\mu\omicron\varsigma$ - and $\tau\omicron\mu\acute{o}\varsigma$ -type nominals and their IE reflexes:

- a. PIE $*t\acute{o}mh_1-o-$ ‘slice’ \Rightarrow $*tomh_1-\acute{o}-$ ‘cutting’
> Gk. $\tau\acute{o}\mu\omicron\varsigma$ ‘slice’ Gk. $\tau\omicron\mu\acute{o}\varsigma$ ‘cutting’
- b. PIE $*w\acute{o}lh_1-o-$ ‘choice’ \Rightarrow $*wolh_1-\acute{o}-$ ‘choosing’
> Ved. $v\acute{a}ra-$ ‘choice’ Ved. $var\acute{a}-$ ‘suitor’
- c. PIE $*\hat{k}\acute{o}uh_x-o-$ ‘swell’ \Rightarrow $*\hat{k}ouh_x-\acute{o}-$ ‘swelling’
> — (\Rightarrow Sp. *cueva* ‘cave’) Lat. *cavus* ‘hollow’

- Analyzing $\tau\omicron\mu\acute{o}\varsigma$ -type nominals in (19) as covert non-primary derivatives explains irregular **pretonic root mid vowel** via SCHINDLER’S GENERALIZATION in (14):

(14) **PIE non-primary derivatives preserve root vocalism of their base.**

(20) PIE neuter **-men-* and **-mon-* stem nominals and their IE reflexes:

- a. PIE **d^hér-men-* ‘support’ ⇒ **d^her-món-* ‘supporting’
 > Ved. *dhárma* ‘foundation’ Ved. *dharmānam* ‘support(er)’
- b. PIE **d^héh₁-men-* ‘establishment’ ⇒ **d^heh₁-món-* ‘establishing’
 > Gk. *θῆμα* ‘tomb’ Gk. *θρημῶν* ‘heap’
- c. PIE **h₂éug-men-* ‘growth’ ⇒ **h₂eug-món-* ‘growing’
 > Lat. *augmen* ‘increase’ Ved. *ojmānam* ‘strength’
 Lith. *augmuō* ‘sprout’

► Broad agreement that PIE had **-mon-* stem nominals formed by ID from neuter **-men-* stems like (20).

- See, e.g., Schindler (1975a:63–4), Widmer (2004:69), Rau (2009:134), Fortson (2010:122–3), Nussbaum (2014:244, 248), Weiss (2020:281–2).

Internal derivatives as covert non-primary derivatives

(20) PIE neuter **-men-* and **-mon-* stem nominals and their IE reflexes:

- a. PIE **d^hér-men-* ‘support’ ⇒ **d^her-món-* ‘supporting’
 > Ved. *dhárma* ‘foundation’ Ved. *dharmānam* ‘support(er)’
- b. PIE **d^héh₁-men-* ‘establishment’ ⇒ **d^heh₁-món-* ‘establishing’
 > Gk. *θῆμα* ‘tomb’ Gk. *θῆμῶν* ‘heap’
- c. PIE **h₂éug-men-* ‘growth’ ⇒ **h₂eug-món-* ‘growing’
 > Lat. *augmen* ‘increase’ Ved. *ojmānam* ‘strength’
 Lith. *augmuō* ‘sprout’

- ▶ Broad agreement that PIE had **-mon-* stem nominals formed by ID from neuter **-men-* stems like (20).
- ▶ Reconstruction of **suffixal stress** (rather than root per EM) in strong cases of PIE **-mon-* stems supported by (Yates 2020, 2022):
 - ▶ Consistent suffixal stress in Vedic.
 - ▶ (In)direct traces of suffixal stress in Greek, Lithuanian, and Anatolian.

Internal derivatives as covert non-primary derivatives

(20) PIE neuter **-men-* and **-mon-* stem nominals and their IE reflexes:

- a. PIE **d^hér-men-* ‘support’ ⇒ **d^her-món-* ‘supporting’
> Ved. *dhárma* ‘foundation’ Ved. *dharmānam* ‘support(er)’
- b. PIE **d^héh₁-men-* ‘establishment’ ⇒ **d^heh₁-món-* ‘establishing’
> Gk. *θῆμα* ‘tomb’ Gk. *θημῶν* ‘heap’
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> Lat. *augmen* ‘increase’ Ved. *ojmānam* ‘strength’
Lith. *augmuō* ‘sprout’

- Analyzing **-mon-* stem nominals in (20) as covert non-primary derivatives explains irregular **pretonic root mid vowel** via SCHINDLER’S GENERALIZATION in (14):

(14) **PIE non-primary derivatives preserve root vocalism of their base.**

(14)

SCHINDLER'S GENERALIZATION:

PIE non-primary derivatives preserve root vocalism of their base.

- ▶ SCHINDLER'S GENERALIZATION can be analyzed as a case of CYCLICITY (“synchronic analogy” per Kiparsky 2015:3).
 - ▶ CYCLICITY \approx 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.

(21) *Non-cyclic stress in American English (monomorphemic nominals):*

àbracadábra

dèlicatéssen

Mèditerránean

Kàlamazóo

- ▶ Cyclic effects are cross-linguistically common — e.g., in present-day American English (Hayes 1982, Pater 2000, Bermúdez-Otero 2012, *i.a.*).
 - ▶ When a word contains a sequence of three pretonic light syllables (/LLLσ/), the **first** regularly receives secondary stress ([̀LLLσ]).

Cyclicity in cross-linguistic perspective

(22) *Cyclic stress in American English (derived nominalizations):*

- a. *imáagine* ⇒ *imàginátion* ^x*imáginátion*
- b. *oríginal* ⇒ *orìgináality* ^x*òrigináality*
- c. *divísible* ⇒ *divìsibíality* ^x*dìvisibíality*
- d. *phenómenon* ⇒ *phenòmenóology* ^x*phènomonóology*

- ▶ Cyclic effects are cross-linguistically common — e.g., in present-day American English (Hayes 1982, Pater 2000, Bermúdez-Otero 2012, *i.a.*).
 - ▶ But derived nominals like (22) **preserve primary stress of their base** as secondary stress, blocking its regular assignment to **initial syllable**.

(23) *Pretonic deletion in PIE primary derivatives:*

- a. PIE */g^{wh}en-énti/ → *[g^{wh}n-énti] > Ved. *ghnánti* 'they kill'
> Hitt. *kunanzi* 'kill'
- b. PIE */ph₂tér-éi/ → *[pəh₂tr-éi] > Ved. *pitré* 'to/for father'
>> Gk. πατήρ 'to/for father'
- c. PIE */pentoh₂-ós/ → *[p_̥nth₂-ós] > Ved. *pathás* 'of the path'
> OAv. *paθō* 'of the path'

- ▶ PIE pretonic vowel deletion works similarly.
 - ▶ Primary derivatives lack independent bases, thus show regular (iterative) **pretonic mid vowel deletion**.

Schinder's Generalization and cyclicity

(23) *Pretonic deletion in PIE (non-)primary derivatives:*

a. */b^heud^h-mén-ó-s/ → *[b^hud^h-n-ó-s] > Ved. *budhnás* 'ground'
> Lat. *fundus* 'ground'

b. */b^heud^h-mén-m/ → *[b^hud^h-mén-m] > Gk. *πυθμένα* 'bottom'
↑

▶ PIE pretonic vowel deletion works similarly.

- ▶ Non-primary derivative in (24a) also appears to show regular iterative deletion, since its base in (24b) contains no root mid vowel:

Schinder's Generalization and cyclicity

(25) *Cyclic underapplication of deletion in PIE non-primary derivatives:*

- a. PIE **wét-es-* ‘year’ ⇒ **wet-s-ó-* ‘having a year’
> Gk. ἔτος ‘year’ Ved. *vatsá-* ‘calf’
- b. PIE **b^héid^h-e/o-* ‘persuade’ ⇒ **b^heid^h-ói-* ‘persuasion’
> Gk. πείθω ‘persuade’ Gk. πειθῶ ‘persuasion’
Lat. *fīdō* ‘trust’
- c. PIE **tómh₁-o-* ‘slice’ ⇒ **tomh₁-ó-* ‘cutting’
> Gk. τόμος ‘slice’ Gk. τομός ‘cutting’

▶ PIE pretonic vowel deletion works similarly.

- ▶ But in non-primary derivatives like (25), **root mid vowel is transferred cyclically from base** and thus fails to undergo regular pretonic deletion.

Conclusions & discussion

- ▶ Vowel deletion patterns in non-primary derivatives support reconstruction of:
 - ▶ Phonological process that deleted mid vowels in pretonic syllables.
 - ▶ Morphophonological process whereby root vowels were transferred cyclically from base to non-primary derivative.
- ▶ More broadly, non-primary derivatives provide additional arguments as to why a general theory of PIE morphophonology is necessary:
 - ▶ To economically account for similar vowel deletion patterns across a variety of (non-)primary morphological types.
 - ▶ To accurately identify (covert) non-primary derivatives in the IE languages, thereby distinguishing inherited features from innovations.

Conclusions & discussion

- ▶ Proposals advanced here offer a starting point for development of a general theory of PIE morphophonology.
- ▶ Major question for future research in this domain:

Conclusions & discussion

- ▶ Proposals advanced here offer a starting point for development of a general theory of PIE morphophonology.
- ▶ Major question for future research in this domain:

- **What else belongs in a general theory of PIE morphophonology?**

Thank you!

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 - UCLA PIES Graduate Seminar
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*i-suffixes “replace” the thematic vowel

(A1) Vedic non-primary derivatives formed with the suffixes /-ín-/ , /-ī̃-/ :

THEMATIC BASE	⇒	NON-PRIMARY DERIVATIVE
a. <i>ukthá-</i> ‘praise-hymn’		<i>ukth-ín-</i> ‘accompanied by praise-hymns’
b. <i>śṛṅga-</i> ‘horn’		<i>śṛṅg-ín-</i> ‘having horns’
c. <i>vájra-</i> ‘mace’		<i>vajr-ín-</i> ‘having a mace’
d. <i>sóma-</i> ‘soma’		<i>som-ín-</i> ‘having/bringing soma’
e. <i>áśva-</i> ‘horse’		<i>aśv-ín-</i> ‘having horses; Aśvin’
f. <i>hásta-</i> ‘hand’		<i>hast-ín-</i> ‘having hands’
g. <i>vṛka-</i> ‘wolf’		<i>vṛk-ī̃-</i> ‘female wolf’
h. <i>rátha-</i> ‘chariot’		<i>rath-ī̃-</i> ‘having a chariot; charioteer (M/F)’

- ▶ On the derivational pattern see Brugmann (1906:285), Schindler (1980) (“ersetzt wird”), and Grestenberger (2014:89, 2021) with references.

Traces of “double zero-grade” in non-primary derivatives?

(A2) Possible PIE non-primary derivatives with “double zero-grade:”

- | | | | |
|---|------------------|--|---------------------|
| a. PIE <i>*wéd-es-</i> | ‘water’ | ⇒ <i>*ud-s-ó-</i> | ‘having water’ |
| > Gk. ὕδρος, Arm. <i>get</i> | ‘water’, ‘river’ | Ved. <i>útsa-</i> | ‘wellspring’ |
| b. PIE <i>*h₁reud^h-os</i> | ‘redness’ | ⇒ <i>*h₁rud^h-s-ó-</i> | ‘red’ |
| > Gk. ἔρευθος | ‘redness’ | Lat. <i>russus</i> | ‘red(-haired)’ |
| c. PIE <i>*léuk-es-</i> | ‘light’ | ⇒ <i>*luk-s-ó-</i> | ‘having light’ |
| > Ved. <i>rókas-</i> , OAv. <i>raocah-</i> | ‘light’ | Ved. <i>rukṣá-</i> , Pers. <i>ruxš</i> | ‘shining’ |
| d. PIE <i>*térh₂-men-</i> | ‘boundary’ | ⇒ <i>*t_ṛh₂-m^{n̥}-ó-</i> | ‘having a boundary’ |
| > Gk. τέρμα, Lat. <i>termen</i> | ‘boundary’ | Gk. τρᾶνός (⇒ τρᾶνής) | ‘clear’ (‘id.’) |
| e. PIE <i>*nek̑-(e)w-</i> | ‘death’ | <i>*ṅk̑-w-ó-</i> | ‘having death’ |
| > — (⇒ Gk. νέκυς, Av. <i>nasau-</i> ‘corpse’) | | — (⇒ TA <i>onk</i> , TB <i>enkwe</i> ‘man’) | |

- For arguments in favor see Widmer (2004:72–3), Nussbaum (2010:272–6), and Höfler (2015, 2017).