

1. Introduction

- Among the various Present-stem forming affixes in PIE (1), the “nasal infix” (1d) stands out.
 - Morphophonological:** How do we explain the (unique) **infixal positioning** of nasal infix?
 - Morphosyntactic:** How do we explain the **disparate attested functions** of the nasal infix?
- We provide an integrated solution to both questions using the Mirror Alignment Principle (Zukoff 2023):
 - Its unique infixal positioning derives **from** its unique morphosyntactic properties.

(1) Present-stem forming affixes (cf., e.g., Rix et al. 2001, Lundquist & Yates 2018)

Affix	Aorist root	Derived Present stem
a. */-skʲé/	*√prekʲ ‘ask’	*/prkʲ-skʲé-ti/ ‘ask-PRS-3SG’ > Lat. <i>po-sci-t</i> , Skt. <i>pr̥-cchá-ti</i>
b. */-e/	*√dejkʲ ‘show’	*/déjkʲ-e-ti/ ‘show-PRS.3SG’ > Lat. <i>dīc-i-t</i> , Goth. <i>ga-teih-iþ</i>
c. */-jé/	*√mer ‘die’	*/mr̥-jé-tor/ ‘die-PRS-3SG’ > Skt. <i>mri-yá-te</i> , Lat. <i>mor-i-tur</i>
d. */⟨né⟩/	*√jewg ‘yoke’	*/ju⟨né⟩g-ti/ ‘yoke:PRS-3SG’ > Lat. <i>iu⟨n⟩gi-t</i> , Skt. <i>yu⟨nā⟩k-ti</i>

(2) More nasal infix forms in PIE (cf., e.g., Rix et al. 2001, Lundquist & Yates 2018)

a. *√lejkʷ ‘leave’	⇒ */li⟨né⟩kʷ-ti/ ‘leave:PRS-3SG’	> Skt. <i>ri⟨nā⟩k-ti</i> , Lat. <i>li⟨n⟩qu-it</i>
b. *√kʲlew ‘hear’	⇒ */kʲl⟨né⟩w-ti/ ‘hear:PRS-3SG’	> Skt. <i>śṛ⟨nó⟩-ti</i>
c. *√demh₂ ‘tame’	⇒ */dm̥⟨né⟩h₂-ti/ ‘tame:PRS-3SG’	> Gk. <i>dám⟨nē⟩-si</i> , OIr. <i>-dam⟨na⟩i-d</i>
d. *√pleh₁ ‘fill’	⇒ */pl⟨né⟩h₁-ti/ ‘fill:PRS-3SG’	> Skt. <i>pr̥⟨nā⟩-ti</i> ; Arm. <i>l⟨n⟩ow-ē</i>

2. Mirror Alignment Principle

- We adopt the “Mirror Alignment Principle” [MAP] (Zukoff 2023) as our framework for morpheme ordering.
 - Hierarchical morphosyntactic structure ⇒ linear order, via a ranking of alignment constraints

(3) Mirror Alignment Principle

If a terminal node α asymmetrically c-commands a terminal node β , then the alignment constraint referencing α dominates the alignment constraint referencing β .

- Zukoff (2023): MAP can derive infixation in Arabic verbs. **We import that analysis for PIE.**

5. Confirmatory morphosyntactic evidence for the nasal infix as v not Aspect

- Evidence for (11.i):** Beyond just forming Present stems, we observe a transitivity function for ⟨né⟩ — appropriate to a v — that is absent among other Present-forming affixes: (cf. Meiser 1993, Zasada 2023)
 - Transitivity alternations in Hittite (12a,b) and in comparison across other IE languages (12c); derivation of causatives to adjectival roots (13).
- Evidence for (11.ii):** ⟨né⟩ co-occurs with $-skʲé$ in Hittite (14) (cf. Strunk 1994), a language which lacks the traditional IE aspectual system. We reconstruct this as the original system for PIE.

(12) Transitivity alternations in PIE verbal stems

Simplex stem/intransitive	⇒	Infix stem/causative
a. *h₃érg-t ‘perished’ > Hitt. <i>hark-ta</i> ‘perished’	⇒	*h₃r⟨né⟩g-ti ‘makes perish’ > Hitt. <i>har⟨ni⟩k-zi</i> ‘destroys’ (cf. Arm. <i>harkan-ē</i> ‘hits, kills’)
b. *(s)térǵʰ-t ‘got sick’ > Hitt. <i>īstark-ta</i> ‘got sick’	⇒	*(s)tṛ⟨né⟩ǵʰ-ti ‘makes sick’ > Hitt. <i>īstar⟨ni⟩k-zi</i> ‘makes sick’ (cf. Skt. <i>tṛ⟨nē⟩dhu</i> ‘let him smash’)
c. *plh₁-tó ‘became full’ > Gk. <i>plē-to</i> ‘became full’	⇒	*pl⟨né⟩h₁-ti ‘fills’ > Skt. <i>pr̥⟨nā⟩-ti</i> ‘fills’

3. MAP Analysis

- Aspectual suffixes like $*-skʲé$ — tree in (7) — asymmetrically c-command Root⁰ (due to intervening null v).
 - The MAP ranks ALIGN- $skʲé$ -R above the Root’s alignment constraint (4). This ranking yields **suffixation** (10).

(4) MAP ranking for $*-skʲé$: ALIGN- $skʲé$ -R ≫ ALIGN-ROOT-R

- We claim the nasal infix is in v^0 — tree in (8) — which *does not* asymmetrically c-command Root⁰.
 - MAP agnostic on ALIGN- $né$ -R vs. ALIGN-ROOT-R.

- In this situation, PIE’s default ranking (5) kicks in, leading to the specific ranking in (6), which yields **infixation**.

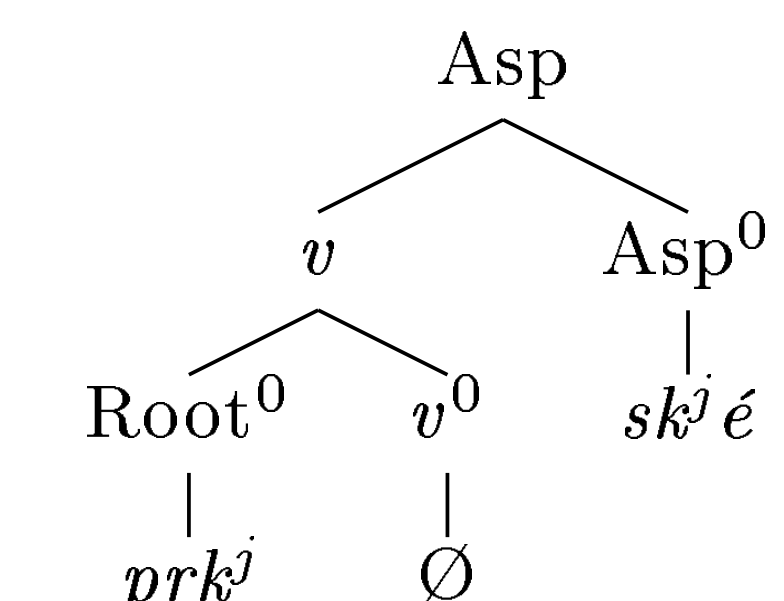
(5) PIE default ranking: ALIGN-ROOT ≫ all other alignment cons.

(6) “Default” ranking for $*-né$: ALIGN-ROOT-R ≫ ALIGN- $né$ -R

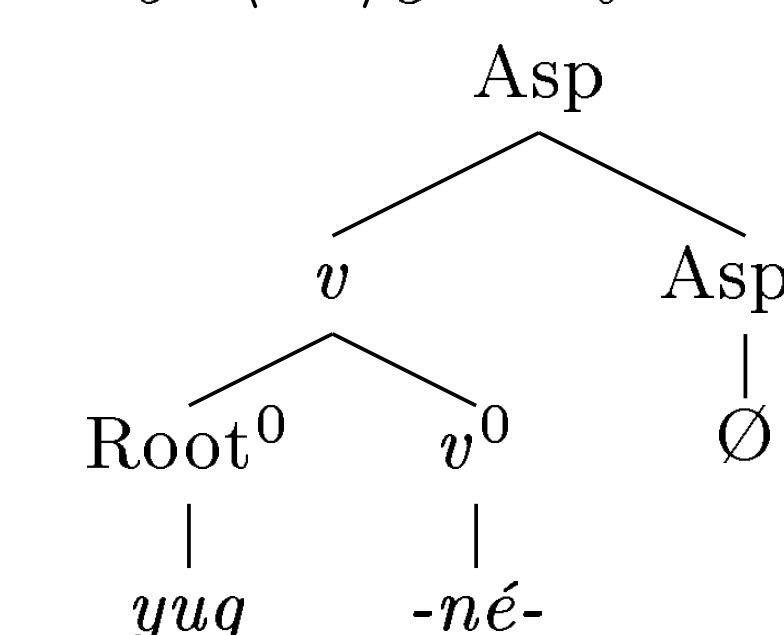
(9) Infixation of ⟨né⟩: *[ju⟨né⟩k-ti]

/jug, né, ti/	ALN-T-R	ALN-Rt-R	ALN- $né$ -R
a. juk-ti-né	*!*	****	
b. jug-né-ti		***!*	**
c. ju⟨né⟩k-ti		**	***
d. i⟨né⟩wk-ti		**	****!
e. né-juk-ti		**	****!*

(7) Aspectual suffix structure
*prkʲ-skʲé-ti ‘ask-PRS-3SG’



(8) Nasal infix structure
*yu⟨né⟩g-ti ‘yoke:PRS-3SG’



(10) Suffixation of $-skʲé$: *[prkʲ-skʲé-ti]

/prkʲ, skʲé, ti/	ALN-T-R	ALN-Rt-R	ALN- $skʲé$ -R
a. prkʲ-ti-skʲé	*!***	****	*****
b. prkʲ-skʲé-ti		**	*****
c. pr̥⟨skʲé⟩kʲ-ti		***!	**
d. p⟨skʲé⟩rkʲ-ti		***!*	**
e. skʲé-prkʲ-ti		****!*	**

4. Predictions

- If the nasal infix is in v and the other Present-forming affixes are in Aspect:

- The two classes should show distinct morphosyntactic behaviors.
- The two classes should be able to co-occur.

→ Looking across the Indo-European languages, we find that both predictions are borne out.

(13) Nasal infix in deadjectival derivation

Adjectival root	⇒	Nasal-infix/causative
a. *√sewh₃ ‘full’ > Hitt. <i>šuw-uš</i> ‘full’	⇒	*su⟨né⟩h₃-ti ‘fills’ > Pal. <i>šū⟨na⟩-t</i> ‘filled’
b. *√pewhₓ ‘pure’ > Lat. <i>pū-rus</i> ‘pure’, Mlr. <i>ú-r</i> ‘fresh’	⇒	*pu⟨né⟩hₓ-ti ‘purifies’ > Skt. <i>pu⟨nā⟩-ti</i> ‘purifies’
c. *√preyhₓ ‘dear’ > Skt. <i>priy-ás</i> , Av. <i>frii-ah</i> ‘dear; own’	⇒	*pri⟨né⟩hₓ-ti ‘endears’ > Skt. <i>pri⟨nā⟩-ti</i> ‘pleases’

(14) Cooccurrence of $*-né-$ and $*-skʲé$ in Hittite verbal stems:

a. <i>har⟨ni⟩k-zi</i> ‘destroy-3SG’	⇒	<i>har⟨nin⟩ki-ške-zzi</i> ‘destroy-IPFV-3SG’
b. <i>šar⟨ni⟩k-zi</i> ‘compensate-3SG’	⇒	<i>šar⟨nin⟩ki-ške-zzi</i> ‘compensate-IPFV-3SG’