Evidence from infix allomorphy on the fine timing of the morphosyntax-phonology interface*

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1 Introduction

Both allomorphy and infixation introduce complexity into morphological systems:

- Allomorphy: Many-to-one correspondence between form and meaning/function

  (1) English PL: gorilla-[**z**], bat-[**s**], midge-[**ɨz**], child-[**rən**], moose-[**∅**], alumn-[**aj**]

  - See, e.g., Carstairs 1987, 1990, Inkelas 1990, Mascaró 1996, 2007, Bobaljik 2000, 2012, Paster 2006, 2009, Veselinova 2006, Bonet et al. 2007, Bye 2008, Embick 2010, Bermudez-Otero 2012, Bye and Svenonius 2012, Pak 2016, Scheer 2016, Kalin 2020b (and many more)

- Infixation: One form interrupts the linear integrity of another form

  (2) Leti (Blevins 1999): **ni** (NOMZR) + **kakri** ('cry') = **k**<**ni**>**akri** ('act of crying')

  - See, e.g., Ultan 1975, Moravcsik 1977, McCarthy and Prince 1993a,b, Hyman and Inkelas 1997, Blevins 1999, Moravcsik 2000, Halle 2001, Horwood 2002, Yu 2007, Wolf 2008, Samuels 2009, Bye and Svenonius 2012, Blevins 2014, Harizanov 2017 (and many more)

Interactions between allomorphy and infixation haven't (before) been systematically studied, but I'll show today that they offer a *uniquely informative window* into questions that arise at the morphosyntax-phonology interface:

(a) How are abstract (morpho)syntactic structures realized as linear phonological sequences?

(b) Is there a serial separation between morphology and phonology, or may considerations of phonological optimization determine morphological choices and operations?

(c) How/when do affixes get to be infixes? Are infixes prefixes and suffixes gone astray, or are they infixes through and through?

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Today's talk: (Kalin 2020a)

§2 **An illustrative case study (Hunzib)**

§3 **Results of the cross-linguistic study of allomorphy involving infixation**

→ 51 case studies from 42 languages (15 language families)

§3.1 On suppletive allomorphy involving an infix

§3.2 On non-suppletive allomorphy of an infix

§3.3 On infixation generally

(On the (non-)optimizing nature of allomorphy and infixation—see Kalin 2020a:§6)

§4 **Implications for theories of infixation**

– Infixation is "indirect", involving a first step of concatenation (as a prefix or suffix) and a second step of repositioning/infixation (contra, e.g., Yu 2007).

§5 **More general implications for the morphosyntax-phonology interface**

– The morphosyntax is converted into a phonological form from the bottom up (à la Bobaljik 2000, Embick 2010, Myler 2017).

– Infixation and (some) phonological processes are cyclic, applying after every instance of exponent insertion.

⇒ Supports the type of serial architecture of Distributed Morphology and related approaches (Halle and Marantz 1993, 1994, Embick 2010, Bye and Svenonius 2012).

1.1 First up: Some definitions

Allomorphy, and related terminology

- **Morpheme**: an abstract morphological element corresponding to **(i)** a set of meanings or functions, and **(ii)** a set of phonological forms (**exponents**)
  - If there is a non-singleton set of exponents, these are **allomorphs** of the morpheme.
- I differentiate two types of allomorphy here (see Kalin 2020a for further differentiation):
  1. **Suppletive:** Replacive; corresponding to distinct underlying phonological forms
  2. **Non-suppletive:** Non-replacive; derived via (morpho)phonological processes

  ⇒ Main diagnostic: "**phonological distance**" (Veselinova 2006:15)—*how much phonological material is shared between the allomorphs, and, relatedly, can both allomorphs reasonably be phonologically derived from one underlying form?*

  ⋆ See the decision tree in Appendix A for more detail ⋆

(3) a. English PL, suppletive forms: **/z/, /rən/, /∅/, /aj/**, ...

b. English PL, non-suppletive variants of /z/: **[z], [s], [ɨz]**

- **Exponent choice** (or **suppletive allomorph choice**): the process of selecting compatible underlying form(s) from a set of suppletive allomorphs in a particular environment.

Infixation, and related terminology

(4) **Definition of Infixation** (Blevins 2014; emphasis added, modifications in brackets)

Under infixation a *bound [exponent]*
whose phonological form **consists minimally of a single segment**,
is **preceded and followed** *in at least some word-types* by **non-null segmental strings**
which together **constitute a relevant form-meaning correspondence of their own**,
despite their non-sequential phonological realization.

(5) Nominalization in Hoava: ***-in-***; wants to be before a vowel (adapted from Blevins 2014)

a. to (alive) → t<**in**>o ('life')
b. hiva (want) → h<**in**>iva ('wishes')
c. ta-poni (PASS-give) → t<**in**>a-poni ('gift')
d. vari-razae (RECIP-fight) → v<**in**>ari-razae ('war')
e. edo (happy) → <**in**>edo ('happiness')

- How I will talk about infixes:
  - The morphological constituent that the infix combines with (and, in the usual case, linearly disrupts) is the **stem of infixation**.
  - The infix's position w.r.t. this stem (usually inside it) is its **surface/infixed** position.
  - The place where an infix surfaces is determined by a condition on its **placement** with respect to a **phonological/prosodic pivot** (Ultan 1975, Moravcsik 1977, Yu 2007).
    - ◇ Most common pivots: C, V, syllable, foot; can include stress
  - Exponents that are simple prefixes or suffixes on all stems *lack* a pivot/placement.

2 Hunzib: A case study of infixation and allomorphy

Hunzib is a Northeast Caucasian language spoken in southern Dagestan.

- *Data below all come from van den Berg 1995, but much of the basic analysis and all of the conclusions and implications drawn are my own.*

Basic phonology and morphology (van den Berg 1995):[1]

- CV(ː)(C) syllables; native roots are maximally disyllabic (vdB:27)
- Rich verbal morphology (incl. class prefixes, derivational and inflectional suffixes) (vdB:74)
- Stress is generally on the penultimate vocalic mora of the word (vdB:28-31)

(6) a. ʔíyu 'mother'
b. k'išáa 'play'
c. ʔɨs-ná-la-s 'siblings (genitive)'

[1] I diverge from the grammar's orthographic conventions in the following ways: (i) I indicate word-initial glottals; (ii) I use IPA [ɑ] for the low back vowel (notated as α in the grammar); (iii) I don't indicate bound roots.

d. qoqó-o ‘house (dative)’

- Constraints on vowels and vowel sequences: (vdB:22)
  - Vowel length is contrastive for all vowel qualities, but /aa/ is by far the most common
  - Long vowels may occur underlyingly or via morphological concatenation
  - But, **long vowels can only surface in stressed syllables**; in an unstressed syllable, long vowels are shortened
  - **Sequences of non-identical vowels are not tolerated**; general repairs: (vdB:33)

(7) a. $V_1\ V_2 \rightarrow V_2$ (general case: first vowel deletes)
b. aa V → aa (if first vowel is *aa*: second vowel deletes)

The verbal plural morpheme (van den Berg 1995:81-83):

- Marks iterativity or plurality of internal argument; compatible with ∼40% of verbs
- Two suppletive allomorphs (phonologically conditioned), (8):

(8) Suppletive allomorphs of the verbal plural marker
a. **-baa** / Vː__ (suffixal on long-V-final stems[2])
b. **-á-** / elsewhere (infixal, before final C)

(9) Suffixal allomorph ***-baa*** (n.b. opacity: stem-final vowel shortens)
a. ʔãqáa (be.thirsty) → ʔãqa**-báa** ‘be thirsty (pl)’ (vdB:283)
b. ũcu-láa (hide-AP) → ucu-la**-báa** ‘hide (pl, intrans)’ (vdB:338)
c. miyaw-dáa (mew-IDEO) → miyaw-da**-báa** ‘mew (pl)’ (vdB:320)

(10) Infixal allomorph ***-á-*** and its non-suppletive variants
a. áhu (take) → ɑ<**á**>hu ‘take (pl)’ (vdB:284)
⋆ creates a long vowel; **no phonological changes** to/around infix
b. ék (fall) → e<**yá**>k ‘fall (pl)’ (vdB:295)
⋆ hiatus resolution via ***y*-insertion** after V[+front] (stem V protected by prior stress)
c. šóše (bandage) → šo<**wá**>še ‘bandage (pl)’ (vdB:334)
⋆ hiatus resolution via ***w*-insertion** after V[–front] (stem V protected by prior stress)
d. čáx (write) → ča<**á**>x ‘write (pl)’ (vdB:292)
⋆ hiatus resolution via **assimilation** (infix vowel may be underspecified?)
e. íx-lə (warm-VBLZ) → ɨx<**á**>-le[3] ‘warm (pl)’ (vdB:308)
⋆ interconsonantal vowel **centralization** (infix vowel may be underspecified?)
f. réλe-k’ (straight-CAUS) → reλ<**á**>-k’ ‘’straighten (pl)’ (vdB:330)
⋆ hiatus resolution via **deletion** ((7a): $V_1\ V_2 \rightarrow V_2$); followed by **centralization**

[2]There is also a handful of verbs that, idiosyncratically, take *baa* as an infix.

(11) Allomorphs of the verbal plural marker (summary)

a. **-baa** / V**ː**__ (suffixal on long-V-final stems)

b. **-á-** / elsewhere (**infix; pivot/placement:** before C)

(i) -yá- / V[+front,–low] __ *(= glide insertion)*

(ii) -wá- / V[–front,–low] __ *(= glide insertion)*

(iii) -á- / a__ *(= assimilation)*

(iv) -á- / C__C *(= centralization)*

Observations about this data in Hunzib:

- **On suppletive allomorphy:**
  - The right edge of the stem plays **a central role**:
    - ◇ Both suppletive allomorphs are **oriented w.r.t. this edge** (suffix, R-edge infix).
    - ◇ Suppletion is **conditioned by this edge**.
      - · Relevant factor: *Is the final segment a long vowel or not?*
    - ◇ Suppletive allomorphy is based on the **underlying form** of this edge; opacity!
      - · After choice of *-baa*, stem-final vowel shortens
      - · e.g., (9a): ʔãqáa → ʔãqa**-báa**
      - · After infixation of *-á-*, any stem-final vowel would necessarily be short too
  - There is apparent non-locality: The infix can end up in a surface position that is **not immediately local** to the conditioning (right) edge
    - ◇ e.g., (10a): áhu → ɑ<**á**>hu
  - Suppletive allomorph choice is not optimizing: *-baa* would be a perfectly fine suffix on all stems; *-á-* would be no worse as an infix in long-V-final stems than any other.

(12) a. áhu 'take' → hypothetical: ɑhu**-báa** (cf. ɑ<á>hu, (10a))

b. koxaa 'be dirty' → hypothetical: ko<**wá**>xa (cf. koxa-báa, vdB: 311)

- **On non-suppletive allomorphy of the infix:**
  - The right edge of the stem plays **no role**.
    - ◇ Non-suppletive alternations are determined stem-internally, **purely locally**, by the infix's immediate environment in its surface (infixed) position.
  - Non-suppletive allomorphy is optimizing, mainly centered on **hiatus avoidance**.
- **On infixation:**
  - Infixation of *á* is not optimizing; *á* would fare similarly well/poorly as a suffix, e.g.:

(13) a. áhu → hypothetical (*á* suffix): ɑh-**á** (cf. ɑ<**á**>hu, (10a))

b. ék → hypothetical (*á* suffix): ek-**á** (cf. e<**yá**>k, (10b))

◇ n.b.: There are underlyingly stressed suffixes consisting of a single V. (vdB:29)

⇒ Summary of findings for Hunzib, and implications for timing:

1. **Suppletive allomorph choice** is sensitive only to the rightmost edge of the stem, is opaque, and is not optimizing.

   → EXPONENT CHOICE (AT RIGHT EDGE) < PHONOLOGY

2. **The infixal allomorph** can surface in a position non-local to this conditioning edge.

   → EXPONENT CHOICE (AT RIGHT EDGE) < INFIXATION

3. **Non-suppletive allomorphy** of the infix is sensitive only to the surface position of the infix, and is optimizing. But **infixation** itself is not optimizing.

   → INFIXATION < PHONOLOGY (OPTIMIZATION; NON-SUPPLETIVE ALLOMORPHY)

3 A cross-linguistic study of allomorphy of infixes

The sample *(see Appendix B for more detail)*

- Identifying case studies: Ultan 1975, Paster 2006, Yu 2007, database searches for keywords (WorldCat, Google Scholar), and word of mouth
- Inclusion criteria: **(i)** at least two phonological forms realize the same morpheme; **(ii)** at least one of these is an infix; **(iii)** available/accessible documentation is sufficient for at least a relatively complete and clear picture of each case study
- **51 case studies from 42 languages** (15 language families), given in table below
  - 32 involve suppletive allomorphy (where at least one allomorph is infixal)
  - 34 involve non-suppletive allomorphy of an infix

Family	**#**	**Languages and countries**
Afro-Asiatic	4	Bole, Mupun (Nigeria); Jebbāli (Oman); Turoyo (Turkey)
Algic	1	Yurok (United States)
Austro-Asiatic	5	Bahnar (Vietnam); Jahai (Malaysia); Katu (Lao PDR); Mlabri (Thailand); Nancowry (India)
Austronesian	14	Ambai, Ambel, Biak, Leti, Muna, Toratán, Sundanese, Wamesa, Wooi (Indonesia); Ida'an Begak (Malaysia); Nakanai (Papua New Guinea); Paiwan, Puyuma, Saisiyat (Taiwan)
Cochimí-Yuman	1	Yuma (United States)
Huavean	1	Huave (Mexico)
Kra-Dai	1	Thai (Thailand)
Mayan	1	Tzeltal (Mexico)
Movima (isolate)	1	Movima (Bolivia)
Muskogean	3	Alabama, Choctaw, Creek (United States)
Niger-Congo	3	Eton (Cameroon); Kichaga, Kimatuumbi (Tanzania)
Northeast Caucasian	3	Budukh (Azerbaijan); Hunzib, Lezgian (Russia)
Salish	2	Nxa'amxcin, Upriver Halkomelem (United States)
Torricelli	1	Yeri (Papua New Guinea)
Uralic	1	Estonian (Estonia)

3.1 On suppletive allomorphy involving an infix

Observation 1: **Suppletion involving an infix may be lexically, morphologically, phonologically, or prosodically conditioned**

- Lexical conditioning: *(20 out of 32 suppletive case studies)*

(14) **Repetitive in Lezgian** (Northeast Caucasian; Dagestan; Haspelmath 1993:174-175)

a. **q^{h}i-** / {SAY, THROW, HIT, DO, GO, BE/BECOME}
   - e.g.: ***q^{h}i-jağun*** 'hit again' (root: *jağun*)

b. **xU-**[4]/ {GIVE, COME, BRING, EAT, CARRY}
   - e.g.: ***x-gun***[5] 'give again' (root: *gun*)

c. **-x-** / {SEE, GET OFF, MIX, PUT/BUILD, SIT DOWN (and many more)}
   - **infix; pivot/placement:** after first vowel
   - e.g.: *ki<**x**>ligun* 'look again' (root: *kiligun*)

- Phonological conditioning: *(12 out of 32 suppletive case studies)*

(15) **Agent voice past in Toratán** (Austronesian; Indonesia; Himmelmann and Wolff 1999:13)

a. **n-** / vowel-initial stem
   - e.g.: ***n-empo*** 'sat' (root: *empo*)

b. **-im-** / consonant-initial stem
   - **infix; pivot/placement:** after first consonant
   - e.g.: *t<**im**>umpa* 'jumped down' (root: *tumpa*)

- Prosodic conditioning: *(9 out of 32 suppletive case studies)*

(16) **Nominalizer in Nakanai** (Austronesian; Papua New Guinea; Johnston 1980:176-179)

a. **-il-** / disyllabic stem
   - **infix; pivot/placement:** before stressed (penultimate) vowel
   - e.g.: *t<**il**>ága* 'fear' (root: *tága*)

b. **-la** / elsewhere
   - e.g.: *mutelé-**la*** 'generosity' (root: *mutéle*)

- Morphological conditioning: *(2 out of 32 suppletive case studies)*

(17) **Nominalizer in Leti** (Austronesian; Indonesia; Blevins 1999:390)

a. **nia-** / Class I verbs
   - e.g.: ***nia-keni*** 'act of putting, placing' (root: *keni*–Class I)

b. **-ni-** / Class II verbs
   - **infix; pivot/placement:** before first vowel
   - e.g.: *k<**ni**>asi* 'act of digging' (root: *kasi*–Class II)

– Class membership is determined by: (i) phonological factors (CC-initial or not), (ii) **morphological factors** (denominalized V, causativized V, or neither), (iii) semantic factors (stative or non-stative V), (iv) lexical factors (idiosyncratically exceptions).

⇒ **Implication:** Suppletive allomorphy involving an infix is just like all other suppletion.

[5]The high vowel in the prefix has undergone Pretonic High Vowel Syncope (Haspelmath 1993:36-38).

Observation 2: **Suppletive allomorphs may differ with respect to pivot/placement**

- One suppletive allomorph may have a pivot/placement (i.e., may be an infix) while other suppletive allomorphs lack a pivot/placement, as seen in all examples above, e.g.:

(16)′ **Nominalizer in Nakanai** (Austronesian; Papua New Guinea; Johnston 1980:176-179)

a. **-il-** / disyllabic stem
   - **infix; pivot/placement:** before stressed (penultimate) vowel
   - e.g.: *t<**il**>aga* 'fear' (root: *taga*)

b. **-la** / elsewhere
   - e.g.: *mutele**-la*** 'generosity' (root: *mutele*)

- More than one suppletive allomorph may be an infix, with distinct pivots/placements:

(18) **Instrumental nom. in Nancowry** (Austro-Asiatic, Nicobar Isl.; Radhakrishnan 1981:60-64)

a. **-an-** / monosyllabic stems
   - **infix; pivot/placement:** after first consonant
   - e.g., *k<**an**>ap* 'tooth' (root: *kap*)

b. **-in-** / disyllabic stems
   - **infix; pivot/placement:** after first vowel
   - e.g., *t<**in**>koʔ*[6] 'to prod' (root: *tikoʔ*)

⇒ **Implication:** Infixation is an exponent-level property (not morpheme-level).

Observation 3: **Suppletive allomorphs share an edge orientation**

- Left-edge infixes co-vary with prefixes—*20 out of 32 suppletive cases*[7]
  - E.g., Toratán above (and Lezgian, Leti, Nancowry above)
- Right-edge infixes co-vary with suffixes—*12 out of 32 suppletive cases*
  - E.g., Hunzib, §2 (and Nakanai above, Alabama below)

⇒ **Implication:** Morphemes (prior to exponence!) are associated with a particular edge.

Observation 4: **Suppletion is conditioned at the edge identifiable via edge-orientation**

(19) **Verbal plural in Hunzib** (Northeast Caucasian, Dagestan; van den Berg 1995:81-82)

a. **-baa** / Vː-final stems
   - e.g.: *ʔãqa**-baa*** 'be thirsty (pl)' (root: *ʔãqaa*)

b. **-ά-** / elsewhere
   - **infix; pivot/placement:** before last consonant
   - e.g.: *e<**yά**>kʼe* 'burn (pl)' (root: *ekʼe*)

[6]The first vowel is lost due to illegal vowel hiatus created by infixation after the first vowel (Kalin 2021b).

[7]These numbers assume internal consistency when it's impossible to tell what edge an infix is oriented towards, e.g., because of short stems and/or stress-placed infixes.

(20) **Nominalizer in Bahnar** (Austro-Asiatic, S. Vietnam; Banker et al. 1979:100-105)

a. **a-** / {TIE.UP}
   - e.g.: ***a-****chô* 'a bundle' (root: *chô*)

b. **bơ-** / *m*-initial stems
   - e.g.: ***bơ-****muih* 'a field in the woods' (root: *muih*)

c. **-ơn-** / elsewhere
   - **infix; pivot/placement:** after first consonant
   - e.g.: *t*<***ơn***>*ăr* 'woven bamboo' (root: *tăr*)

(21) **Middle voice in Alabama** (Muskogean, USA; Hardy and Montler 1991:2-3)

a. **-ka** / two-mora final foot (= final heavy syllable, or light-light syllable sequence)
   - e.g.: *albitii****-ka*** 'be covered, covering' (root: *albitii*)

b. **-l-** / elsewhere
   - **infix; pivot/placement:** before final consonant(s)
   - e.g., *i*<***l***>*pa*[8] 'be eaten, food' (root: *pa*)

⇒ **Implication:** A morpheme's underlying (edgemost) position constrains exponent choice.

Observation 5: The surface environment of an infix cannot condition suppletion

(22) Invented example 1 (unattested)

a. **-n-** / before a nasal in its infixed position
   - **infix; pivot/placement:** before final syllable
   - e.g., *ba*<***n***>*mat* (root: *ba.mat*)

b. **-ka** / elsewhere
   - e.g.: *basat****-ka*** (root: *ba.sat*)

(23) Invented example 2 (unattested)

a. **-n-** / before a nasal in its infixed position
   - **infix; pivot/placement:** before final syllable
   - e.g., *ba*<***n***>*mat* (root: *ba.mat*)

b. **-ka-** / elsewhere
   - **infix; pivot/placement:** before final syllable
     - e.g.: *ba*<***ka***>*sat* (root: *ba.sat*)

⇒ **Implication:** Exponent choice is never made after or alongside infixation.

Interim summary:

- **Being an infix is a property of individual exponents**, not morphemes.
- **Suppletive allomorphy across the sample is edge-constrained** (like in Hunzib, §2):
  - All suppletive allomorphs are oriented w.r.t. ***the same edge***.
  - It is this edge—and ***only this edge***—that is relevant for suppletive allomorphy.

[8] The *i* preceding the infix is due to a general phonological process of epenthesis (Hardy and Montler 1991:6).

⇒ **Implication:** At the point of exponent choice, ***morphemes have already been concatenated with and linearized with respect to their stem***.

→ Exponent choice is made at this stem edge, prior to the infixation of infixal exponents.

3.2 On non-suppletive allomorphy of an infix

Recall: Non-suppletive allomorphy of an infix is found in 34 (of 51) case studies.

Observation 1: **Non-suppletive allomorphy is conditioned only in an infix's surface (infixed) position (the opposite of suppletive allomorphy)**

(19)′ **Verbal plural in Hunzib** (Northeast Caucasian, Dagestan; van den Berg 1995:81-82)

a. **-baa** / Vː-final stems
   - e.g.: *ʔãqa-**baa*** 'be thirsty (pl)' (root: *ʔãqaa*)

b. **-á-** / elsewhere
   - **infix; pivot/placement:** before last consonant
   - e.g.: *e<**yá**>k'e* 'burn (pl)' (root: *ek'e*)

(10)′ Some non-suppletive variants of infixal allomorph -***á***-

a. e<**yá**>k 'fall (pl)' ⋆ **insertion of *y* after front vowel** ⋆

b. šo<**wá**>še 'bandage (pl)' ⋆ **insertion of *w* after back vowel** ⋆

c. ča<**á**>x 'write (pl)' ⋆ **low vowel assimilation** ⋆

(17)′ **Nominalizer in Leti** (Austronesian; Indonesia; Blevins 1999:390)

a. **nia-** / Class I verbs
   - e.g.: ***nia-**keni* 'act of putting, placing' (root: *keni*–Class I)

b. **-ni-** / Class II verbs
   - **infix; pivot/placement:** before first vowel
   - e.g.: *k<**ni**>asi* 'act of digging' (root: *kasi*–Class II)

(24) Non-suppletive variants of infixal allomorph -***ni***-

a. s<**n**>uri 'pour, pouring' ⋆ ***i* deletion before high vowel** ⋆

b. r<**i**>esi 'victory' ⋆ ***n* deletion after sonorant cons.** ⋆

c. r<**∅**>uru 'trembling' ⋆ ***n* and *i* deletion** ⋆

⇒ **Implication:** Phonology sees the infix in its surface/infixed (non-edge) position.

Observation 2: **No hypothetical position for an infix apart from its surface (infixed) position can induce non-suppletive allomorphy**

(11)′ Allomorphs of the verbal plural marker in Hunzib (summary)

a. **-baa** / Vː__ (suffixal on long-V-final stems)

b. **-á-** / elsewhere (**infix; pivot/placement:** before C)

(i) -yá- / V[+front,–low] __ *(= glide insertion)*

(ii) -wá- / V[–front,–low] __ *(= glide insertion)*

(iii) -á- / a__ *(= assimilation)*

(iv) -á- / C__C *(= centralization)*

(25) Root: *uĉ'e* 'cut' (p. 82)

a. Attested verbal plural: $\boxed{u\text{<}\boldsymbol{w\acute{a}}\text{>}\hat{c}\text{'}e}$ (= insertion of *w*)

b. Not attested: $\boxed{{}^{*}u\text{<}\boldsymbol{y\acute{a}}\text{>}\hat{c}\text{'}e}$ (= insertion of *y* in **uĉ'e-á*, pre-infixation)

⇒ **Implication:** Phonology sees the infix *only* in its surface/infixed (non-edge) position.

Interim summary:

- **§3.1:** Where an affix "started" (as a prefix/suffix) is relevant for suppletive exponent choice
- **§3.2:** But this "starting" (edge) environment *cannot* influence non-suppletive allomorphy—the phonology never sees the infix in its stem-edge underlying position.

⇒ The implication is that infixation is immediate following exponent choice, preceding (or perhaps simultaneous with) phonology.

3.3 On infixation generally

Observation 1: Infixes displace to their surface position inwardly, never outwardly

(17)′ **Nominalizer in Leti** (Austronesian; Indonesia; Blevins 1999:390)

a. **nia-** / Class I verbs
   - e.g.: ***nia-****keni* 'act of putting, placing' (root: *keni*–Class I)

b. **-ni-** / Class II verbs
   - **infix; pivot/placement:** before first vowel
   - e.g.: *k*<***ni***>*asi* 'act of digging' (root: *kasi*–Class II)

(26) A re-verbalized nominalized verb in Leti (Blevins 1999:389-390)

a. ta-s<**ni**>òi (cf. *t<**ni**>a-sòi[9])
   1PL.INCL.I-<NOM>shift
   'we (incl.) inherit'

b. [AGR [VBLZ [NOM [shift]]]]

⇒ **Implication:** At the point of infixation, there's no phonologically-contentful outer material.

Observation 2: An infix can satisfy its pivot/placement looking inwardly at the stem edge (without displacing), never outwardly

- It is well-known that when an infix can satisfy its pivot/placement by looking inwardly at the stem edge, it can stay at the stem edge, e.g., Leti again:

(27) The infix ***-ni-*** with V-initial stems (Blevins 1999:401)

a. <***ni***>*atu* 'knowledge' (root: *atu*)

b. <***ni***>*odi* 'act of carrying, load' (root: *odi*)

[9]Note that the problem cannot be the creation of a *tn* onset, as this is permitted, e.g., *t*<*ni*>*eti*, 'chopping' (Blevins 1999:390). Note also that the infix can surface inside an affix in Leti, so long as that affix is inward relative to the nominalizer, e.g. *-ni-* + *va-kini* (RECIP-kiss) → *v*<*ni*>*a-kini* 'reciprocal kissing' (Blevins 1999:400).

- Compare a pivot/placement that could hypothetically be found outwardly:

(19)′ **Verbal plural in Hunzib** (Northeast Caucasian, Dagestan; van den Berg 1995:81-82)

a. **-baa** / V꞉-final stems
   - e.g.: *ʔãqa**-baa*** 'be thirsty (pl)' (root: *ʔãqaa*)

b. **-á-** / elsewhere
   - **infix; pivot/placement:** before last consonant
   - e.g.: *e*<***yá***>*k'e* 'burn (pl)' (root: *ek'e*)

(28) The verbal plural with C-initial outer tense marking (van den Berg 1995:82)

a. r-i<**yá**>ƛe-n (cf. *r-iƛe<**yá**>-n / *r-iƛ<**á**>-n)
   CLASS-kill<VPL>-PRET.GER
   'killed (iterative, plural object)'

b. [AGR [[[kill] VPL] PRET.GER]]

- Even when an infix could hypothetically satisfy its pivot/placement outwardly from the stem edge, it cannot stay at the stem edge; it must displace inwardly.

⇒ **Implication:** At the point of infixation, there's no phonologically-contentful outer material.

Interim summary:

- In a complex word where an infix's pivot/placement could hypothetically be found by the infix displacing or looking locally in either direction, **the infix does not have the option of displacing or looking away from its stem (outwardly)**.
- The implication of this is that an infixal exponent takes its surface (infixed) position immediately after the exponent has been chosen, and before any other affixes are exponed.
  - In other words, exponent choice and infixation proceed from the **bottom-up**.

4 How and when do affixes get to be infixes?

The literature has offered a plethora of accounts of infixal positioning, which can be grouped into two broad types:[10]

- **Indirect infixation accounts:** Infixation after prefixation/suffixation (w.r.t. the stem)
  (see, e.g., Anderson 1972, Moravcsik 1977, Halle 2001, Horwood 2002, Plank 2007, Embick 2010, Bye and Svenonius 2012, Bacovcin and Freeman 2016)
- **Direct infixation accounts:** No intermediate step of linear concatenation
  A. Infixes have a prefixal/suffixal nature (w.r.t. the stem)
  (see, e.g., Cohn 1992, Prince and Smolensky 1993, McCarthy and Prince 1993a, Zoll 1996, Buckley 1997, Hyman and Inkelas 1997, Kaufman 2003, Klein 2005, Wolf 2008)

[10] These three types map loosely, but not perfectly, onto Yu's (2007) groupings of accounts into (i) derivational versions of the Phonological Readjustment theory of infixation; (ii) constraint-based versions of the Phonological Readjustment theory of infixation; and (iii) versions of the Phonological Subcategorization theory of infixation.

B. Infixes are infixes through and through (no prefixal/suffixal nature w.r.t. the stem)
(see, e.g., Anderson 1992, Inkelas 1990, Yu 2007, Samuels 2009)

Direct infixation accounts (two types)

⇒ Infixes take their infixed position *directly*, without stopping off first as a prefix/suffix.

A. Infixes are still prefixes/suffixes (w.r.t. the stem) in some abstract way; what this underlying nature of an affix does is compel stem edge proximity.

- E.g., McCarthy and Prince 1993a:

(29) **Tagalog actor focus** (McCarthy and Prince 1993a:21, citing French 1988)

	root	root+AF
'teach'	aral	<**um**>aral
'write'	sulat	s<**um**>ulat
'graduate'	gradwet	gr<**um**>adwet

(30) Relevant constraints for Tagalog (McCarthy and Prince 1993a:22-24):

a. NO-CODA: Syllables are open
b. ALIGN-*um*: Align($[\text{um}]_{\text{Af}}$, L, Stem, L) (= *um* is a prefix)

(31) Input (unlinearized): {gradwet, um}

Candidates	NO-CODA	ALIGN-*um*
a. [–um.grad.wet.	*** !	
b. [g–um.rad.wet.	*** !	g
c. ☞ [gr–u.mad.wet.	**	gr
d. [grad.w–u.met.	**	gradw !

- Note that, when phonological constraints don't alone determine infix placement (e.g., in non-/anti-optimizing), a second Align constraint can be used to establish infixal position.

B. There is no designation of infixes as prefixes or suffixes (w.r.t. the stem).

– E.g., Yu (2007:48), "infixes are formally no different from prefixes and suffixes, except for the fact that, while prefixes and suffixes target morphological constituents, infixes target phonological ones".

(32) **Mlabri nominalization** (Yu 2007:76-79, citing Rischel 1995:85)

	root	root+NOM
'be ablaze'	gɯh	g<**rn**>ɯh
'sweep the ground'	peelh	p<**rn**>eelh
'be rolled up'	kwɛl	k<**r**>wɛl
'peel'	pluut	p<**r**>luut

(33) ALIGN-*rn*: Align(*rn*, L, C_1-Stem, R) (= *rn* follows the first C)

(34) Input (unlinearized): {kap, rn}

	ALIGN(*rn*, L, C_1-STEM, R)
a. k**rn**ap	✓
b. **rn**kap	*
c. ka**rn**p	*

- Note that under a Type B direct infixation account, it is necessary for the pivot/placement governing the infix to include "first" vs. "last" information (C_1 in (33)).
  - E.g., Yu 2007:Ch. 4-5 attributes edge proximity to diachronic and acquisition-related factors, rather than to an underlying prefixal/suffixal nature of an infix (contra both indirect infixation and Type A direct infixation).

Indirect infixation accounts

⇒ Infixes concatenate first as prefixes or suffixes (w.r.t. the stem), and then undergo phonological displacement to become infixes.

- Supported by the present findings (repeated from §3.1):
  - All suppletive allomorphs are oriented w.r.t. ***the same edge***.
  - It is this edge—and ***only this edge***—that is relevant for suppletive allomorphy.

  ⇒ **Implication:** At the point of exponent choice, ***morphemes have already been concatenated with and linearized with respect to their stem***.

  → Exponent choice is made at this stem edge, prior to the infixation of infixal exponents.
- Direct infixation accounts cannot capture these findings in any straightforward way, related to the lack of a pre-infixation step of linearization.
- The findings do *not*, however, tell us...
  (i) What the *nature* of the preliminary step of concatenation/linearization is (or exactly when it takes place).
    - ◇ Morpheme ordering could be a byproduct of the morphosyntactic structure (à la Kayne 1994, Bye and Svenonius 2012, *i.a.*).
    - ◇ Morpheme ordering could come from idiosyncratic properties of each phrase, head, or morpheme involved (e.g., Harley 2011).
    - ◇ But, ordering *cannot* be exponent-specific (contra a number of approaches to prefixation/suffixation); see Kalin and Rolle 2021.

  (ii) Whether infixation should generally be modeled as phonologically optimizing (like for Tagalog above), or via alignment constraints (specifying pivot/placement, like for Mlabri above), or through some mix of the two.
- *This type of account will be illustrated in §5.*

5 Cyclicity and derivational ordering

The following **binary ordering statements** are supported by the present findings (§3), where $<$ indicates a derivational precedence relation ($\alpha < \beta = \alpha$ derivationally precedes β).

(35) a. EXPONENT CHOICE $<$ INFIXATION
   (i) Infixation is a property of individual exponents.
   (ii) Suppletive allomorphy is conditioned at the stem edge.
   (iii) An infix's surface environment cannot condition suppletive exponent choice.

   b. LINEAR CONCATENATION $<$ EXPONENT CHOICE
   (i) Suppletive allomorphs share an edge orientation.
   (ii) Suppletive allomorphy is conditioned at this shared edge.

   c. INFIXATION $<$ PHONOLOGY[11]
   (i) Non-suppletive allomorphy of an infix is conditioned in its infixed position.
   (ii) Non-suppletive allomorphy shows no trace of a non-infixed position.
   (iii) Infixation is often non- or anti-optimizing. (See Kalin 2020a:§6.2.)
   (iv) Infixal positioning can be opaque. (See Kalin 2020a:§5.3.)

   d. EXPONENT CHOICE $<$ PHONOLOGY
   (i) An infix's surface environment cannot condition suppletive exponent choice. (For more discussion see Appendix C.)
   (ii) Suppletive allomorphy is often non- or anti-optimizing. (See Kalin 2020a:§6.1.)

Cumulatively across (35), we arrive at the following internally-consistent ordering:

(36) LINEAR CONCATENATION $<$ EXPONENT CHOICE $<$ INFIXATION $<$ PHONOLOGY

Taking some liberty with filling in underdetermined aspects of the ordering, these findings conform to the following late-insertion-based model:[12]

(37) ***The fine timing of the morphosyntax-phonology interface***
   a. Build the abstract morphosyntactic structure
   b. Bottom-up realization: Go to the most embedded unexponed morpheme, and apply a cycle of the following operations, in this order:
      (i) Concatenation (i.e., establish linear precedence)
      (ii) Exponent choice (**suppletive allomorphy**)
      (iii) Linear displacement (**i.e., infixation, for infixal exponents**)
      (iv) Restricted/cyclic phonology (**non-suppletive "restricted" allomorphy**)[13]
      (Repeat (i)-(iv) until there are no more unexponed morphemes in domain)
   c. Surface/post-cyclic phonology (**non-suppletive "surface" allomorphy**)
      (Repeat (a)-(c) for every phase/spell-out domain)

[11] These findings do not rule out the possibility that infix placement is *sometimes* handled by the phonology.
[12] For a recently-compiled list of arguments for late insertion, see Kalin and Weisser 2021.
[13] See Kalin 2020a for the distinction made here between "restricted" and "surface" non-suppletive allomorphy.

5.1 An illustration of the model

Here I'll walk us through a sample derivation, using (38) (see §3.3):

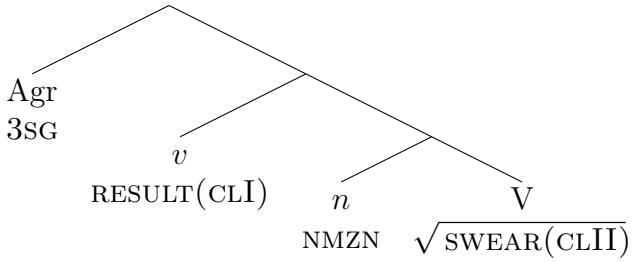
(38) A re-verbalized nominalized verb in Leti (Blevins 1999:389)

na-l<**i**>òkra
3SG.I-<NMZN>swear
'he has sworn'

Step 1: Building the morphosyntactic structure

Following Blevins (1999:388), I assume a null v resultative head mediates between the inflectional prefix and the nominalized verb, and is responsible for the nominalization's Class I designation:

(39)



Step 2: Cyclic operations

(40) **Cycle 1**

a.	Concatenation:	$\sqrt{\text{SWEAR}}$
b.	Exponent choice: $\sqrt{\text{SWEAR}} \rightarrow$ *lòkra*$_{II}$	lòkra$_{II}$
c.	Linear displacement: n/a	- - -
d.	Cyclic phonology: n/a	- - -
→	Output:	lòkra$_{II}$

(41) **Cycle 2**

a.	Concatenation:	NMZN-lòkra$_{II}$
b.	Exponent choice: NMZN → *-ni-* / Class II verbs	<ni>lòkra$_{II}$
c.	Linear displacement: *-ni-* → __V	l<ni>òkra$_{II}$
d.	Cyclic phonology: $n \rightarrow \emptyset$ / [[-syll,+son]__ ...]$_{\text{NOM}}$	l<i>òkra$_{II}$
→	Output:	l<i>òkra$_{II}$

(42) **Cycle 3**

a.	Concatenation:	RESULT-l<i>òkra$_{II}$
b.	Exponent choice: RESULT → $\emptyset_I$	$\emptyset_I$-l<i>òkra$_{II}$
c.	Linear displacement: n/a	- - -
d.	Cyclic phonology: n/a	- - -
→	Output:	$\emptyset_I$-l<i>òkra$_{II}$

(43) **Cycle 4**

a.	Concatenation:	3SG-$\emptyset_I$-l<i>òkra$_{II}$
b.	Exponent choice: 3SG → *na-* / Class I verbs	na-$\emptyset_I$-l<i>òkra$_{II}$
c.	Linear displacement: n/a	- - -

d. Cyclic phonology: n/a - - -
→ Output: na-$\emptyset_I$-l<i>òkra$_{II}$

Step 3: Surface phonology

(44) No additional changes: naliòkra

5.2 A welcome payoff

This same model predicts which inter-morphemic relationships in the stem of infixation will and will not survive the intrusion of an infix (Kalin 2021a, in prep):

- Suppletive allomorphy always survives the intrusion of an infix.
- Non-suppletive allomorphy may or may not survive the intrusion of an infix, depending on the nature of the phonological process at hand.

For example, consider Nancowry (Austroasiatic; Radhakrishnan 1981, Kalin 2021b):

- The infix: The instrumental nominalizer *-in-* is a derivational affix that combines with verbs and derives instrument nouns; it surfaces after the first consonant of the stem, (45).
  - (Not shown here: The instrumental nominalizer exhibits suppletive allomorphy, (18).)

(45) a. **-in-** (INOM) + calɯak (swallow) → c<**in**>lɯak 'a throat' (R:146)
b. **-in-** (INOM) + tikoʔ (prod) → t<**in**>koʔ 'a prod' (R:97)

- Relationship: The causative morpheme in Nancowry has two prosodically-conditioned suppletive forms (one of which is itself an infix), determined by the size of its stem:

(46) a. CAUS ↔ **ha-** / monosyllabic stems (47a)
b. CAUS ↔ **-um-** / disyllabic stems (47b)

(47) a. CAUS + pin 'thick' → **ha-**pin 'to thicken something' (R:111)
b. CAUS + paloʔ 'loose' → p<**um**>loʔ 'to loosen' (R:150)

  - Suppletive allomorphy of the causative **survives infixation of the instrumental nominalizer**, (48):[14]

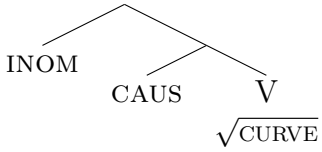
(48) a. **-in-** (INOM) + ha-kuãt (CAUS-curve) → h-<**in**>kuãt 'a hook' (R:96)
b. [INOM [CAUS [V]]]

⇒ **Implication:** Exponent choice in the stem of infixation precedes infixation.

[14] I do not show the *-um-* allomorph surviving infixation of the nominalizer because infixation of *-um-* followed by infixation of *-in-* actually results in the surface-disappearance of *-um-*; this can be explained by completely predictable phonological/phonotactic repairs within the language, but would take us too far afield here. See Kalin 2021b:13-14.

Step 1: Building the morphosyntactic structure

(49)



Step 2: Cyclic operations

(50) **Cycle 1**

a.	Concatenation:	$\sqrt{\text{CURVE}}$
b.	Exponent choice: $\sqrt{\text{CURVE}} \rightarrow$ *kuãt*	kuãt
c.	Linear displacement: n/a	- - -
d.	Cyclic phonology: prosodification	[$_\sigma$ kuãt]
→	Output:	[$_\sigma$ kuãt]

(51) **Cycle 2**

a.	Concatenation:	CAUS-[$_\sigma$ kuãt]
b.	Exponent choice: CAUS → *ha-* / __σ	ha-[$_\sigma$ kuãt]
c.	Linear displacement: n/a	- - -
d.	Cyclic phonology: prosodification	($_{\text{Ft}}$ [$_\sigma$ ha][$_\sigma$ kuãt])
→	Output:	

(52) **Cycle 3**

a.	Concatenation:	INOM-($_{\text{Ft}}$ [$_\sigma$ ha][$_\sigma$ kuãt])
b.	Exponent choice: INOM → *-in-* / __Ft	<in>($_{\text{Ft}}$ [$_\sigma$ ha][$_\sigma$ kuãt])
c.	Linear displacement: *-in-* / V__	($_{\text{Ft}}$ [$_\sigma$ ha]<in>[$_\sigma$ kuãt])
d.	Cyclic phonology: prosodification	($_{\text{Ft}}$ [$_\sigma$ ha<in>][$_\sigma$ kuãt])
→	Output:	($_{\text{Ft}}$ [$_\sigma$ ha<in>][$_\sigma$ kuãt])

Step 3: Surface phonology

(53) Vowel hiatus resolution: ($_{\text{Ft}}$ [$_\sigma$ hin][$_\sigma$ kuãt])

6 Summing up and looking ahead

Core findings:

- **Infixation is...**
  - a property of exponents, not morphemes
  - an inward-looking and inward-displacing phenomenon
- Allomorphy and infixation interact crosslinguistically in a consistent set of ways:
  - **Suppletive allomorphy (involving an infix) is...**
    - ◇ edge-constrained, in terms of both conditioning and relative exponent positioning
    - ◇ not synchronically driven by optimization (see Kalin 2020a)

- **Non-suppletive allomorphy of an infix is...**
  - ◇ edge-free, with no trace of an edgemost position—variation is determined by the surface environment only
  - ◇ optimizing (see Kalin 2020a)

Core implications:

- The morphosyntax is converted into a phonological form from the bottom up (see, e.g., Bobaljik 2000, Embick 2010, Myler 2017).
  - Exponence, infixation, and phonology are cyclic, applying in that order alongside the bottom-up exponence of every morpheme.
  - Suppletive allomorph choice (exponence) precedes phonology (in line with Halle and Marantz 1993, Paster 2006, Rolle 2020, *i.a.*, and in contrast to parallel models like Prince and Smolensky 1993, Mascaró 2007, Wolf 2008, Bermudez-Otero 2012).
- Infixes are prefixes/suffixes (linearized first as preceding/following their stem) that later go astray (become infixal), contra e.g. McCarthy and Prince 1993a, Yu 2007, Wolf 2008.

⇒ These conclusions are very naturally accommodated within a general architecture like that assumed by **Distributed Morphology** (Halle and Marantz 1993, 1994), providing strong novel support for this type of theory of morphology.

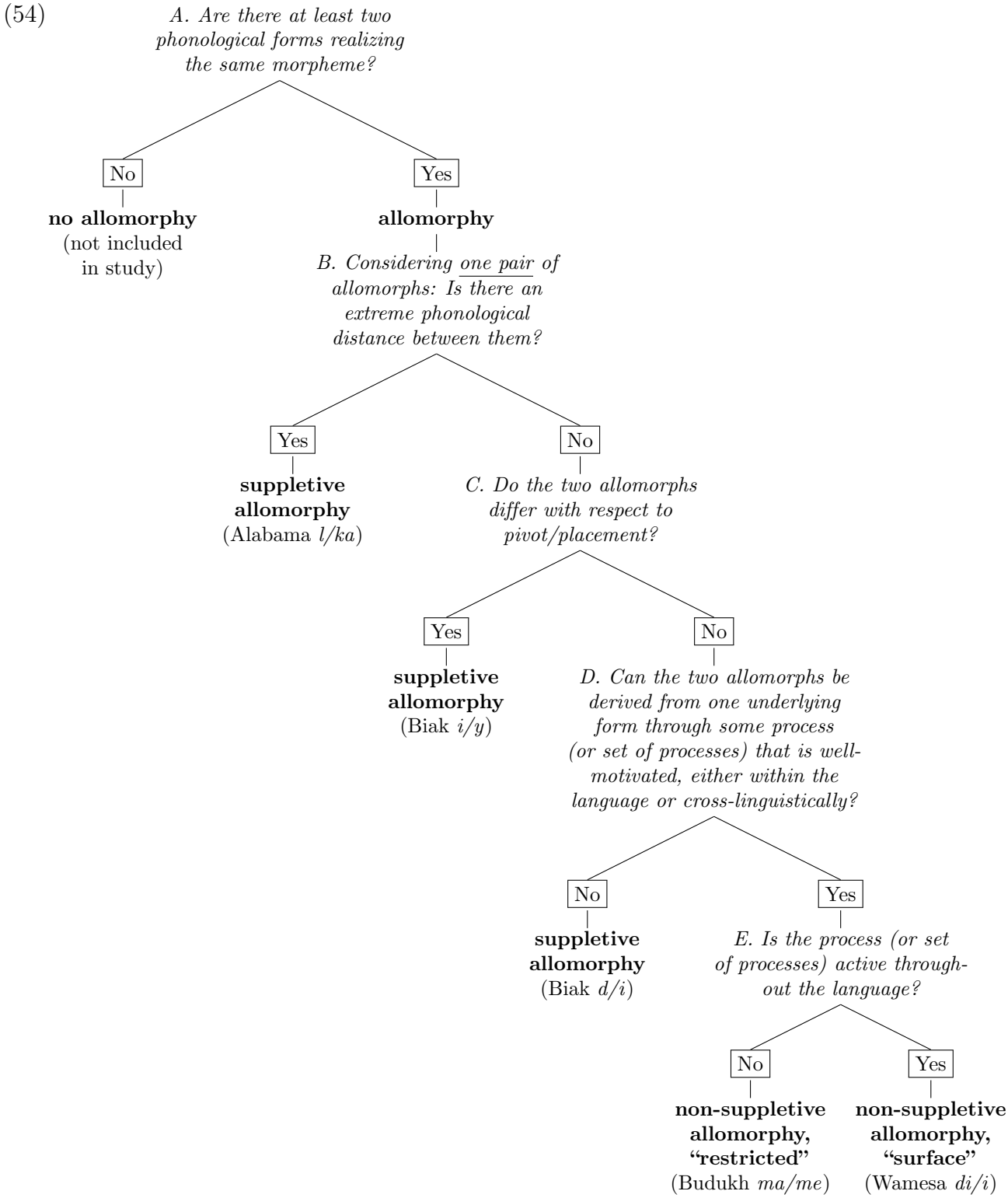
- Similar conclusions have been reached by recent investigations of root-and-template morphology (see, e.g., Kastner 2019).

Extensions of the study

- Collecting more case studies, especially from a wider variety of language families
- Expanding outward from my current definition of working infixation
  - Smaller "infixes"—subsegmental/featural changes (e.g., ablaut)
  - Bigger "infixes"—word-sized morpheme-disruptors (e.g., tmesis)
- Understanding the relationship between infixation and other displacement phenomena, e.g.:
  - Second position elements
  - Endoclitics
  - Mobile affixes
  - Root and template morphology
- Allomorphy *around* the site of infixation (see Kalin 2021a, in prep)

Appendix A: Decision tree for diagnosing suppletive vs. non-suppletive allomorphy (Kalin 2020a)

(54)



Appendix B: List of case studies

Table 1: Case studies (by family and language)

Language (country)	Morpheme	Edge	Suppl. condition	Main source(s)
Afro-Asiatic				
Bole (Nigeria)	distributive	left	lexical	Gimba 2000, Zoch 2017
Jebbāli (Oman)	plural	right	prosodic, lexical	Al Aghbari 2012
Mupun (Nigeria)	pluractional	right	lexical	Frajzyngier 1993
Turoyo (Turkey)	past	left	(none)	Jastrow 1993, Kalin 2020b
Algic				
Yurok (United States)	intensive	left	(none)	Garrett 2001
Austro-Asiatic				
Bahnar (Vietnam)	nominalizer	left	phonological (mel.), lexical	Banker 1964
Jahai (Malaysia)	causative	left	prosodic, lexical	Burenhult 2002
Katu (Lao PDR)	nominalizer	left	lexical	Costello 1998
Mlabri (Thailand)	nominalizer	left	(none)	Rischel 1995
Nancowry (India)	causative	left	prosodic	Radhakrishnan 1981
	instrumental	left	prosodic	Radhakrishnan 1981
Austronesian				
Ambai (Indonesia)	2sg subject	left	(none)	Silzer 1983
	3sg subject	left	(none)	Silzer 1983
Ambel (Indonesia)	sg partic. sbj	left	lexical	Arnold 2018
Biak (Indonesia)	2sg subject	left	lexical	van den Heuvel 2006
	3sg subject	left	phonological	van den Heuvel 2006
Ida'an Begak (Malaysia)	reciprocal	left	phonological (mel.), lexical	Goudswaard 2005
Leti (Indonesia)	nominalizer	left	phonological, lexical, morphological	Blevins 1999, van Engelenhoven 2004
Muna (Indonesia)	irrealis	left	(none)	van den Berg 1989
Nakanai (PNG)	nominalizer	right	prosodic, lexical	Johnston 1980
Paiwan (Taiwan)	agent focus	left	(none)	Ferrell 1982
Puyuma (Taiwan)	AV/intransitive	left	phonological (mel.)	Teng 2008
	perfective	left	phonological (melody)	Teng 2008
Saisiyat (Taiwan)	agent voice	left	(none)	Zeitoun et al. 2015
Sundanese (Indonesia)	plural	left	(none)	Cohn 1992
Toratán (Indonesia)	AV past	left	phonology	Himmelmann and Wolff 1999
	UV past	left	phonological (melody), lexical	Himmelmann and Wolff 1999
Wamesa (Indonesia)	2sg subject	left	(none)	Gasser 2014
	3sg subject	left	(none)	Gasser 2014
Wooi (Indonesia)	2sg subject	left	(none)	Sawaki 2016
	3sg subject	left	(none)	Sawaki 2016
Cochimí-Yuman				
Yuma (United States)	verbal pl (PL3)	left	(none)	Halpern 1947, Gillon and Mailhammer 2015
Huavean				
Huave (Mexico)	passive	right	lexical	Kim 2008
Kra-Dai				
Thai (Thailand)	specialization	left	(none)	Huffman 1986, Blevins 2014

Table 2: Case studies (by family and language) continued

Language (country)	Morpheme	Edge	Suppl. condition	Main source(s)
Mayan				
Tzeltal (Mexico)	intransitivizer	right	lexical	Slocum 1948
Movima (isolate)				
Movima (Bolivia)	irrealis	left	(none)	Haude 2006
Muskogean				
Alabama (United States)	middle voice	right	prosodic	Hardy and Montler 1991
Choctaw (United States)	iterative	right	(none)	Ulrich 1986, Broadwell 2006, Lombardi and McCarthy 1991
Creek (United States)	dual/plural	right	phonological (melody)	Martin 2011
	perfective	right	phonological	Martin 2011
Niger-Congo				
Eton (Cameroon)	G-form	right	prosodic	Van de Velde 2008
Kichaga (Tanzania)	intensive	right	(none)	Yu 2007, Inkelas p.c.
Kimatuumbi (Tanzania)	perfective	right	pros., phono. (mel.), morph.	Odden 1996
Northeast Caucasian				
Budukh (Azerbaijan)	prohibitive	left	(none)	Alekseev 1994
Hunzib (Russia)	verbal plural	right	phonological	van den Berg 1995
Lezgian (Russia)	repetitive	left	lexical	Haspelmath 1993
Salish				
Nxa'amxcin (United States)	inchoative	left	lexical	Willett 2003
Upriver Halkomelem (U.S.)	verbal plural	left	lexical	Galloway 1993, Thompson 2009
Torricelli				
Yeri (Papua New Guinea)	additive	left	lexical	Wilson 2014
	imperfective	left	lexical	Wilson 2014
Uralic				
Estonian (Estonia)	illative	right	lexical, prosodic	Hirvonen 2020

Appendix C: Are morphology and phonology separate, or simultaneous?

Can suppletive allomorph choice be regulated by considerations of phonological optimization? Or is suppletive allomorph choice prior to and independent of such considerations?

Three answers to this question in the literature:

A. Phonologically- and prosodically-conditioned allomorphy is always regulated by the phonological component of the grammar.

- See, e.g., McCarthy and Prince 1993a,b, Mester 1994, Kager 1996, Hyman and Inkelas 1997, Horwood 2002, Wolf 2008.

B. Suppletive allomorph choice is always prior to and independent from the phonological component.

- See, e.g., Halle and Marantz 1993, Trommer 2001, Paster 2006, Bye 2008, Embick 2010, Bye and Svenonius 2012, Pak 2016, Dawson 2017, Rolle 2020, Stanton 2020

C. Phonologically- and prosodically-conditioned suppletive allomorphy are split into two types: non-/anti-optimizing allomorphy, which is determined prior to phonology, and optimizing allomorphy, which is regulated by the phonology.

  - See, e.g., Booij 1998, Mascaró 2007, Bonet et al. 2007, Nevins 2011, Bermudez-Otero 2012, Yu 2017, de Belder 2020

The findings in this paper add a new typological argument in support of the non-hybrid, morphology-before-phonology approach.

- If suppletive allomorph choice could be made in the phonological component/alongside the phonological computation, then...
  - (i) the surface (infixed) environment of an infix should be able to influence suppletive allomorph choice, and
  - (ii) there should be cases of suppletive allomorphy that are not analyzable via edge-based subcategorization, i.e., that necessitate global optimization
- But, such cases are absent from my findings.
  - In Kalin (2020a:§6.3), I argue that apparent counterexamples (e.g., those in Yu 2017), do not hold up to scrutiny.

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