

The morphological/phonological behavior of bipartite morphemes

Nicholas Rolle (Leibniz-ZAS, Berlin)

rolle@leibniz-zas.de

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“The *wheres* and *whens* of affixation”

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1 OVERVIEW

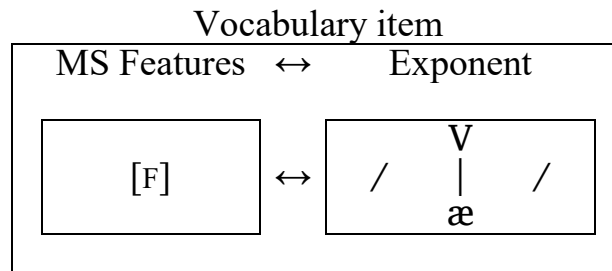
- (1) **‘Bipartite morphemes’** (Harris 2017:17, Kuryłowicz 1966 [1945-1949])
 - A single linguistic category expressed by discontinuous parts
 - The parts themselves do not individually express separate categories
 - E.g. circumfixation
- (2) **Central thesis**
 - These two parts always behave independently from one another with respect to morphological and phonological behavior
 - They are **co-exponents**, not a single discontinuous exponent
- (3) **Big picture:** What is a possible exponent?
 - ^{ok} [F] ↔ / æ_i ... β_j / co-exponents
 - * [F] ↔ / æ_i ... β_i / *one discontinuous exponent
- (4) **Major goal** of today’s talk:
 - Develop/assess predictions on the difference between these conceptions
- (5) **Roadmap** of today’s talk
 - §2 Theoretical and empirical preliminaries
 - §3 Examining the predictions
 - §4 Bipartite morphemes with grammatical tone
 - §5 Summary

2 THEORETICAL AND EMPIRICAL PRELIMINARIES

2.1 *Mapping features to exponents*

- (6) Basic syntax-phonology mapping
 - Mapping from **Morpho-Syntactic Features** [F] (terminals of a tree)
 - Mapping to an **Exponent**, consisting of strings of phonological units (features, gestures, tones, handshapes, *etc.*)
 - This mapping is a **Vocabulary Item**, *à la* DM (Embick 2015:9, *i.a.*)
e.g. [F] ↔ / æ /

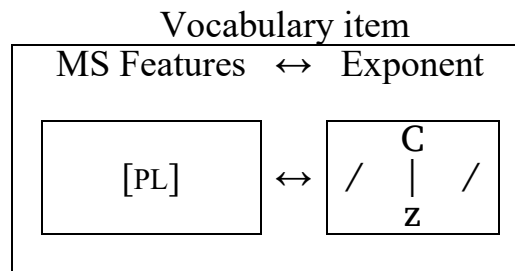
(7)



(8) Simplex vocabulary item:

- English [PL] ↔ /-z/ (-s)

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(9) Morphological primitives

- Exponents in our sense can also be understood as “**recurrent partials**” not composed of other recurrent partials, or simply as “**morphs**” (Hockett 1947:322, Crysmann & Bonami 2016:314, Haspelmath 2020, *i.a.*)
- Purposely avoiding the term “**morpheme**” in any technical sense

2.2 *Bipartite morphemes*

(10) What kind of **complex vocabulary items** are possible?

- I.e. those where it is not simply a one-to-one mapping *à la* (8) above

(11) One complex pairing are “**bipartite morphemes**”, with two defining criteria

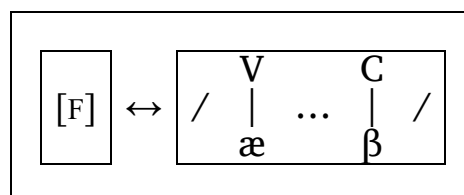
(Harris 2017:17, Kuryłowicz 1966 [1945-1949])

(12) **Discontinuity:**

- A single linguistic category is expounded by discontinuous parts (i.e. inherent non-locality of phonological material)
- [F] ↔ /æ ... β/

(13) The phonological substance of the two parts are not string-adjacent on the relevant phonological tier

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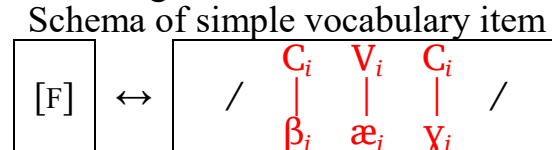
- (14) **Non-compositionality:**
- The meaning of the whole is not composed based on the meaning of the α and the meaning of β , i.e. it is non-compositional (e.g. Marušič 2003)
- (15) One common type is **circumfixation** (Bergenholtz & Mugdan 1979:59, Greenberg 1980, Mel'čuk 1982:84f., Bauer 1988:20f., Anderson 1990:284f., 1992:53, Spencer 1991:12-13, Hall 2000, Marušič 2003, to appear, Lieber 2017, Zingler 2022, among many others)
- (16) **German** (Zingler 2022:60, *i.a.*)
- Regular suffixation for infinitive marking
google-n
google-INF
'to google'
 - Circumfixation of participle marking
ge-google-t
PTCP₁-google-PTCP₂
'(to have/be) googled'
 - Prefix *ge-* expresses no specific meaning in absence of *-t*, and vice versa
- (17) Other **discontinuous morphemes**
- Discontinuous morphemes/dependencies in Athabaskan languages (Navajo [[nav](#)] – Spencer 1991:210-211; Witsuwit'en [[bcr](#)] – Hargus 2017)
 - Splitting verbs, in several West African languages (Yoruba [[yor](#)] – Awobuluyi 1971, Sebba 1987, Parrish & Feldscher 2019; Edo [[bin](#)] – Ogie 2009:167; Guébie [[gic](#)] – Sande 2017:37ff.)
- (18) **Infix-inducing verbs** in Lakhota ([[dak](#)] – Boas & Deloria 1941, Albright 2000)
- For the full paradigm of subject markers, these markers may appear both as prefixing and as infixing
 - Unlike normal infixes, their position is idiosyncratically determined by the verb root (i.e. not inherent to the affix, and not due to phonotactics)
- (19) Lakhota 1s subject **wa-** which by default is a prefix
- *lówan* 'he sings' → **wa-lówan** 'I sing'
 - *máni* 'he walks' → **ma-wá-ni** 'I walk'
- (20) Albright uses a * convention to indicate the location within a verb root where a prefix is drawn into, rendering the root inherently discontinuous:
- Prefixing verbs: *thanín* 'be visible' (Buechel 1970)
 - Infixing verbs: *tha*phá* 'follow'

2.3 *Focus of this talk*

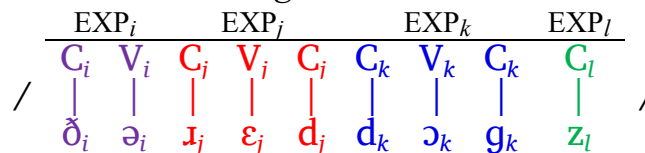
- (21) **Central thesis:**
- In a bipartite morpheme mapping [F] ↔ / α ... β /, the two parts / α / and / β / always behave independently from one another with respect to morphological and phonological behavior
 - They constitute **two distinct exponents**

- (22) Couched within **Morphological Color Theory** (van Oostendorp 2006, 2007, Revithiadou 2007, Trommer 2015, 2022, Zimmermann 2017, Paschen 2018, Zaleska 2018)
- “every morpheme has a unique color shared by all its phonological elements (segments, features, and, of course, tones)” (Trommer 2022)
 - “...cannot change the colour of any phonological element: it cannot give colour to epenthetic material, and it cannot alter the colours of underlying material” (van Oostendorp 2017:3)

- (23) Visually, diagramed through distinct colors and/or distinct subscript indices

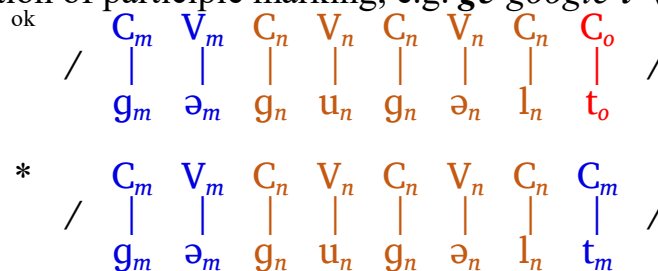


- (24) A simple phrase like *the red dogs* is rendered:



- (25) We require a necessary modification:
- The multiple exponents of bipartite morpheme (e.g. circumfixes) are also morphologically distinct, i.e. they have **distinct morphological colors**
 - Thus, **modify the characterization from** “every *morpheme* has a unique color shared by all its phonological elements” (Trommer 2022, italics mine)
 - ...to “every *exponent* has a unique color shared by all its phonological elements”

- (26) Circumfixation of participle marking, e.g. *ge-google-t* ‘(have/be) googled’



- (27) Schematically rendered:
- ^{ok} [F] ↔ / $\alpha_i \dots \beta_j$ / two exponents
 - * [F] ↔ / $\alpha_i \dots \beta_i$ / *a discontinuous exponent

- (28) Supporting previous statements that bipartite morphemes like circumfixes be treated as formally two (or more) objects from the perspective of post-syntax/the PF branch (Marušič 2003, to appear, Crysmann & Bonami 2016:347 within Information-based Morphology, Haspelmath 2020, among others)

3.1 *Insertion & allomorphy*(37) **Prediction 1 – Insertion:**

- The conditions governing the (non-)insertion of one exponent never affect the (non-)insertion of the other exponent

(38) **Prediction 2 – Allomorphy (i.e. of the suppletive type):**

- Allomorphy that is triggered by, or targeting, one of the exponents never affects the other exponent

(39) German *ge-...-t/-en* (Zingler 2022)

	Suffixation		Circumfixation
a.	<i>spiel-en</i> play-INF [ˈʃpilən] ‘to play’		<i>ge-spiel-t</i> PTCP ₁ -play-PTCP ₂ [gəˈʃpɪlt] ‘(have/be) played’
b.	<i>geb-en</i> give-INF [ˈgebən] ‘to give’		<i>ge-geb-en</i> PTCP ₁ -give-PTCP ₂ [gəˈgebən] ‘(have/be) given’

(40) German prefix *ge-* must be before stress

- *diagnostizier-t* [diagnɔstɪˈtʃiɪrt]
diagnose-PTCP₂ ‘(to have/be) diagnosed’
- Cf. **ge-diagnostizier-t* *[gədiagnɔstɪˈtʃiɪrt] ~ *[gəˈdiagnɔstɪtʃiɪrt]

(41) Lack of an interaction

- These two morphological quirks – the insertion of *ge-* and the allomorphy of *-t/-en* – **never** show any idiosyncratic interaction
- “There are simply two affixes... As far as (morpho-)phonology proper is involved, there is no evidence whatsoever for the link between the affixes.” (Drijkoningen 1999:78)
- See survey of German irregular verbs in **Appendix (97)**

(42) Consider the representative German data in the table below

- This shows that an irregular suffix (with or without concomitant root changes) **never** determines whether the prefix appears (row a.)
- Equally, lack of a prefix **never** determines shape of a suffix (row b.)

(43)

	Suffixation		Circumfixation
a.	<i>sprech-en</i> speak-INF [ˈʃpɛçən] ‘to speak’		<i>ge-sproch-en</i> PTCP ₁ -speak-PTCP ₂ [gəˈʃpɔxən] ‘(have/be) spoken’
		cf. * <i>sproch-en</i>	*[ˈʃpɔxən]
b.	<i>ver-sprech-en</i> DER-speak-INF [fɛɐ̯ˈʃpɛçən] ‘to promise’		<i>ver-sproch-en</i> DER-speak-PTCP ₂ [fɛɐ̯ˈʃpɔxən] ‘(have/be) promised’
		cf. * <i>ver-sproch-t</i>	*[fɛɐ̯ˈʃpɔxt]

(44) These facts follow if each exponent is endowed with its own context, i.e. its own **subcategorization frame** (Kalin & Rolle in press, *inter alia*)

(45) German circumfixation exponents (with separate morphological colors)

$$[\text{PTCP}] \leftrightarrow \{ \text{g}\ddot{\text{a}}\text{-} / \text{-}'\sigma \} \dots \left\{ \begin{array}{l} \text{-}\ddot{\text{a}}\text{n} / \text{ROOT}_{\text{irr}} \text{-} \\ \text{-t} / (\text{elsewhere}) \end{array} \right\}$$

(46) Cf. Discontinuous exponents – **Share** contextual specifications (Zingler 2022)

$$[\text{PTCP}] \leftrightarrow \left\{ \begin{array}{l} 1. \text{g}\ddot{\text{a}}\text{-}\dots\text{-}\ddot{\text{a}}\text{n} / \text{-}'\sigma \ \& \ \text{ROOT}_{\text{irr}} \text{-} \\ 2. \text{g}\ddot{\text{a}}\text{-}\dots\text{-t} / \text{-}'\sigma \text{-} \\ 3. \text{-}\ddot{\text{a}}\text{n} / \text{-} \text{ROOT}_{\text{irr}} \text{-} \\ 4. \text{-t} / (\text{elsewhere}) \end{array} \right\}$$

(47) Drawbacks of the latter:

- First, results in a **duplication of information**
- Second, we could easily create an allomorph set which lacks something equivalent to allomorph 1 or allomorph 3 above
- This should result in **non-locality effects**
- Under a scenario where allomorph 3 is missing, if the prefixal component is absent, then the suffixal component concomitantly should return to the default form (cf. (43)b above)

(48) We would expect to find some language to have suppletion between circumfix and a suffix

$$[\text{F}] \leftrightarrow \left\{ \begin{array}{l} \text{ka-}\dots\text{-e} / \text{ROOT}_{\text{irr}} \text{-} \\ \text{-it} / (\text{elsewhere}) \end{array} \right\}$$

(49) We predict such patterns to be typologically unattested

(50) In short, **the two exponents do not act as a single morphological unit**

3.2 *Derivedness & minimality*

(51) The two exponents also should not act as a single morpho-phonological unit

(52) **Prediction 3 – Derivedness:**

- When the two exponents are incidentally adjacent, they always act as a derived environment (with respect to morpho-phonological processes)
- This should be evident in fact any time the two exponents interact locally

(53)

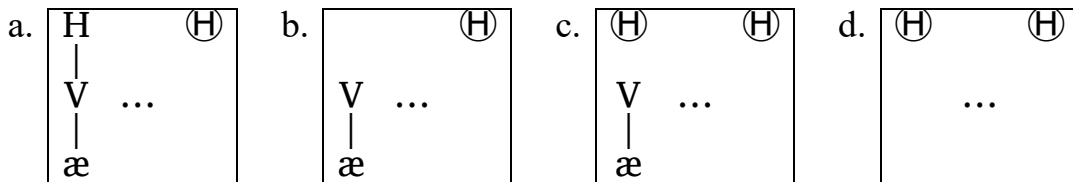
	Simple affixation		Circumfixation		
a.	Non-derived vs. derived env. 's		Exponents predicted to act as derived		
	<i>soki</i>	[soki] * [sotʃi]	<i>k-ak-it</i>	[k-atʃ-it]	* [k-ak-it]
	<i>bak-i</i>	[batʃ-i] * [bak-i]	<i>k_i-Ø-it_j sot</i>	[tʃ _i -it _j sot]	* [k _i -it _j sot]
			(Cf. <i>k_i-Ø-it_i sot</i>	expected to stay	[k _i -it _i sot])

- (54) **Prediction 4 – Minimality** (not discussed further)
- If there are special minimality-based faithfulness (e.g. don't delete vowel of 1σ 'morphemes'), then the individual exponents are evaluated for minimality separately

4 BIPARTITE MORPHEMES WITH GRAMMATICAL TONE

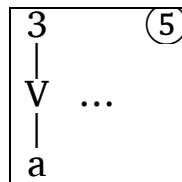
4.1 *Empirical types*

- (55) Possible types of bipartite morphemes involving floating grammatical tones, where the tone appears non-locally



- (56) Cantonese “changed tone” ([yue] – Alderete, Chan, and Tanaka 2022)
- /wɔŋ²¹/ → [a:³³-wɔŋ³⁵] ‘Mr. Wong’
 - /dze²²/ → [a:³³-dze³⁵] ‘Mr. Tse’
 - /ŋ²³/ → [a:³³-ŋ³⁵] ‘Mr. Ng’
 - /gu³³/ → [a:³³-gu³⁵] ‘Mr. Gu’
 - /dun³⁵/ → [a:³³-dun³⁵] ‘Mr. Tung’
 - /foŋ⁵³/ → [a:³³-foŋ⁵⁵] ‘Mr. Fong’
 - /buk⁵⁵/ → [a:³³-buk⁵⁵] ‘Mr. Buk’

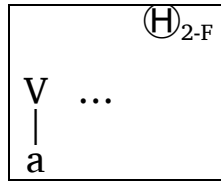
- (57) Can be *prima facie* analyzed as:



- (58) Cilungu – Far Past tense marker *a-* appears at **left edge** but its co-accompanying grammatical tone appears at **right edge** ([mgr] – Bickmore 2007, Rolle & Bickmore 2022)

- yá-a-sukilil-a (H)_{2-F} → yá-a-sukííl-á [yáásúkíílá]
3P-T-accompany-FV T ‘they have already accompanied’
- tú-a-sópolol-a (H)_{2-F} → tú-a-sópólól-á [twáásópólólá]
1P-T-untie-FV T ‘they have already untied’
- u-a-yá-sukilil-il-e (H)_{2-F} → u-a-yá-sukííl-íl-é [wàáyású!kíílílé]
3S-T-3P-accompany-ASP-FV T ‘he/she accompanied them’
- tú-a-cí-ziik-il-e (H)_{2-F} → tú-a-cí-ziis-íl-é [twáácízíísilé]
1P-T-just-bury-ASP-FV T ‘we had just buried’

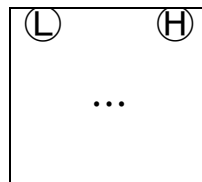
(59) *Prima facie* analyzable as:



(60) Liko – Deriving adjectives from verbs with tonal circumfix ([Lük] – de Wit 2015)

- H-toned verb root: búng- ‘lose’
 mù-búkù mú-**(L)**-búng-à-**(H)** → mùbúkù mú¹**búngǒ**
 3-quiver 3.ADJ-**DER**-lose-FV-**DER** ‘a lost quiver’ (p. 162)
- L-toned verb root: bák- ‘carve’
 dàgǎ-tù tí-**(L)**-bák-à-**(H)** → dàgǎtù tí**bákǎ**
 13.arrow-13 13.ADJ-**DER**-carve-FV-**DER** ‘carved arrows’ (p. 163)

(61) *Prima facie* analyzed as:



(62) **Central inquiry:** Do bipartite morphemes involving floating tones act like a **single morphological unit** or do the co-exponents act as **separate units** (in line with our thesis)?

(63) Evidence gathered thus far support the latter

- **Allomorphy** targets one of the co-exponents, not both
- The two co-exponents act like a **derived environment**

4.2 *Grammatical tone allomorphy*

(64) **Grammatical tone allomorphy** in Cilungu

- Recent Past tense marker *á-* has two grammatical tone variants
- $\overline{yá}$ -**á**-sukilil-a \overline{H}_F → $\overline{yá}$ -**á**-sukilil-**á** [yáásúkíllá]
 3P-**T**-accompany-FV **T** ‘they have just accompanied’
- \overline{u} -**á**-sukilil-a \emptyset → \overline{u} -**á**-sukilil-**a** [wàásúkíllà]
 3S-**T**-accompany-FV **T** ‘he/she has just accompanied’
- $\overline{yá}$ -**á**-sópolol-a \overline{H}_F → $\overline{yá}$ -**á**-sópolol-**á** [yáásópóllá]
 3P-**T**-untie-FV **T** ‘they have just untied’
- \overline{u} -**á**-sópolol-a \emptyset → \overline{u} -**á**-sópolol-**a** [wàásópóllà]
 3S-**T**-untie-FV **T** ‘he/she has just untied’

(65) Realizational rule

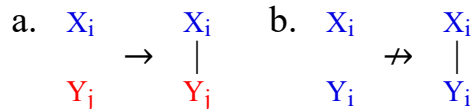
$$[\text{RECENT}] \leftrightarrow \{ \acute{a} \} \dots \left\{ \begin{array}{l} \overline{H}_F / H - [\text{SM}] - \\ \emptyset / (\text{elsewhere}) \end{array} \right\}$$

- (66) **Idiosyncrasy of this allomorphy** (see Rolle & Bickmore 2022 for details)
- The same grammatical tone allomorphy **always** appears with Recent Past prefix *á-*, which appears in several related TAM designations (e.g. the “Yesterday Past”, the “Yesterday Past Progressive”, the “Recent Past Progressive”, and the “Recent Perfect”)
 - And the same grammatical tone allomorphy appears **only** in the context of the Recent Past prefix *á-*
 - Two other TAM contexts also show grammatical tone allomorphy, but not the same allomorphs or distribution (the plain Perfect with *-il*, and the Subjunctive/Imperative)
 - All other TAM contexts with all other morphology show no grammatical tone allomorphy, showing that this **alternation is not general**
- (67) In total: Tonal allomorphy does not affect segmental morphology
- Reverse should also hold: Segmental allomorphy does not affect tonal morphology –**Remains to be evaluated**

4.3 *Derivedness*

- (68) **Derived environment effects**
- An original motivation for Morphological Color Theory involves accounting for Derived Environment Effects (DEEs – van Oostendorp 2007)
 - DEEs, in short, are phonological processes that apply across morphemes but not within them
- (69) **Korean palatalization** (van Oostendorp 2007, citing Iverson 1993, Polgárdi 1998, Rhee 2002)
- /hæ-tot-i/ ‘sun-rise-NOM’ → [hæ-dod₃-i] * [hæ-dod-i]
 - /mati/ ‘knot’ → [madi] * [mad₃i]
- (70) **Derived environment effects by morphological color**
- Epenthetic (i.e. colorless material) is in black
- a. $h_a \quad \text{æ}_a \quad t_b \quad o_b \quad t_b \quad i_c$ → $h_a \quad \text{æ}_a \quad d_b \quad o_b \quad d_{3b} \quad i_c$
[high]_c → [high]_c
- b. $m_d \quad a_d \quad t_d \quad i_d$ → * $m_d \quad a_d \quad d_{3d} \quad i_d$
[high]_d → [high]_d
- (71) **Formalized as a constraint ALTERNATION** (van Oostendorp 2007)
- “if an association line links two elements of colour α ” (i.e. the same morpheme index), then “the line should also have colour α ” (i.e. not be epenthetic)
 - In short, do not associate phonological structure of the same color (unless they are underlyingly associated)

(72) General schema



(73) Derivedness with respect to tone:

- We can examine this by contrasting two types of floating tone patterns
- **Local** floating tone versus **non-local** (e.g. the circumfixal type above)

(74) Local floating tone

- Floating tones which are local to accompanying segmental material show a Derived Environment Effect cross-linguistically
- **The floating tone and the segmental material are banned from associating**

(75) Hausa participle suffix $-(L)w\acute{a}\acute{a}$ ([*hau*] – Newman 1986:257-258)

- $k\acute{o}m\acute{o}o \rightarrow k\acute{o}m\acute{o}o\text{-}w\acute{a}\acute{a}$ ‘returning (here)’ (Cf. * $k\acute{o}m\acute{o}o\text{-}w\grave{a}\grave{a}$)
- $b\acute{i}nc\acute{i}k\acute{e}\acute{e} \rightarrow b\acute{i}nc\acute{i}k\acute{e}\acute{e}\text{-}w\acute{a}\acute{a}$ ‘investigating’ (Cf. * $b\acute{i}nc\acute{i}k\acute{e}\acute{e}\text{-}w\grave{a}\grave{a}$)
- $d\acute{a}f\grave{a}\grave{a} \rightarrow d\acute{a}f\grave{a}\grave{a}\text{-}w\acute{a}\acute{a}$ ‘cooking’ (Cf. * $d\acute{a}f\grave{a}\grave{a}\text{-}w\grave{a}\grave{a}$)

(76) Hausa plural suffix $-(L)\acute{a}\acute{i}$ (Newman 2000:434-435, Trommer 2022)

- H $m\acute{a}s\acute{a}u\acute{k}\acute{i}\acute{i} \rightarrow m\grave{a}s\grave{a}u\grave{k}\text{-}\acute{a}\acute{i}$ ‘guest rooms’
Cf. * $m\acute{a}s\acute{a}u\grave{k}\text{-}\acute{a}\acute{i} \sim * m\acute{a}s\acute{a}u\acute{k}\text{-}\grave{a}\grave{i} \sim * m\grave{a}s\grave{a}u\grave{k}\text{-}\grave{a}\grave{i}$
- HL $m\acute{a}\acute{a}l\grave{a}m \rightarrow m\grave{a}\grave{a}l\grave{a}m\text{-}\acute{a}\acute{i}$ ‘teachers’
Cf. * $m\acute{a}\acute{a}l\grave{a}m\text{-}\grave{a}\grave{i} \sim * m\grave{a}\grave{a}l\grave{a}m\text{-}\grave{a}\grave{i}$
- LHL $w\grave{a}k\acute{i}\acute{i}l\grave{i} \rightarrow w\grave{a}k\grave{i}\acute{i}l\text{-}\acute{a}\acute{i}$ ‘representatives’
Cf. * $w\grave{a}k\acute{i}\acute{i}l\text{-}\grave{a}\grave{i} \sim * w\grave{a}k\grave{i}\acute{i}l\text{-}\grave{a}\grave{i}$

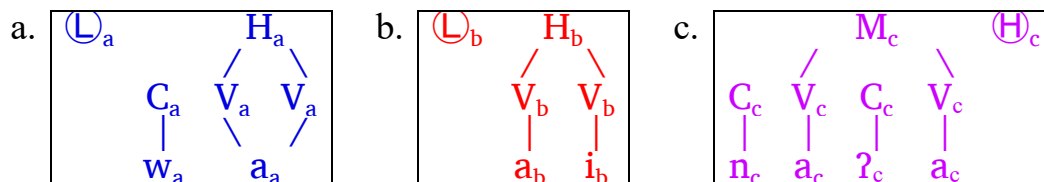
(77) Southeastern Nochixtlán Mixtec floating tones ([*mxy*] – McKendry 2013: 136-137)

- $/\beta\acute{e}^{\text{H}}\acute{e}/ \quad j\acute{a}j\grave{a}^n/ \rightarrow [\beta\acute{e}^{\text{H}}\acute{e} \quad j\acute{a}j\grave{a}^n]$
house coyote ‘the coyote’s house’
- $/n\acute{a}^{\text{H}}\acute{a}/ \quad j\acute{a}j\grave{a}^n/ \rightarrow [n\acute{a}^{\text{H}}\acute{a} \quad j\acute{a}j\grave{a}^n]$
hand coyote ‘the coyote’s front paw’

(78) Complete neutralization in isolation, however

- I.e. floating H cannot ‘self-associate’
- $/\beta\acute{e}^{\text{H}}\acute{e}/ \rightarrow [\beta\acute{e}^{\text{H}}\acute{e}]$
- $/n\acute{a}^{\text{H}}\acute{a}/ \rightarrow [n\acute{a}^{\text{H}}\acute{a}] \quad * [n\acute{a}^{\text{H}}\acute{a}]$

(79) Single exponents involving local floating tone (one color)



(80) Bans akin to self-association are prevalent in theoretical morpho-phonology literature (e.g. Carleton & Myers’ 1996 *DOMAIN constraint; Revithiadou 1999: 75-80, 2007; Wolf’s 2007

‘tautomorphic docking’; Trommer’s 2011 ‘incest taboo problem’; McPherson’s 2014: 89 ‘self-control’; i.a.)

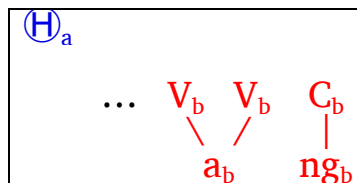
- In general, “floating features show a strong tendency to associate to segmental material which is not part of the same morpheme” (Trommer 2022)

(81) Compare bipartite morphemes

- Let us now compare this to the behavior of bipartite morphemes involve floating tones, where the floating tone does *not* appear locally
- Under our analysis, these co-exponents should bear distinct morphological colors

(82) One example comes from the Bantu language Idakho ([ida] – Ebarb 2014)

- The right-oriented suffix *-aang* IMPERFECTIVE co-occurs with left-oriented floating tone (H) which docks to the second mora of the stem (Σ)



(83) Idakho ‘circumfixal’ bipartite morpheme (Ebarb 2014:144,161,322)

- a-(reeβ- H aang-a) Σ → a-(reeβ-aang-a) Σ [àrèéβáàngà]
3S-ask-IPFV-FV ‘s/he asks’
- a-(kalushits- H aang-a) Σ → a-(kalúshits-aang-a) Σ [àkàlúshítsààngà]
3S-return-IPFV-FV ‘s/he returns’
- a-(sebulukhanyiny- H aang-a) Σ → a-(sebúlukhanyiny-aang-a) Σ
3S-scatter-IPFV-FV [àsèbúlúkànyinyààngà] ‘s/he is scattering’
- a-shi-(lakuul-w- H aang-w-a) Σ tá → a-shi-(lakhúulw-aang-wa) Σ tá
3S-still-release-PASS-IPFV-PASS-FV NEG [àshilàkhúùlwààngwà tá] ‘s/he is still not being released’

(84) Prediction

- Because the co-exponents have two separate morphological colors, we expect them to be able to associate, e.g. when *-aang* is incidentally in the position of the second mora
- **This is borne out – Self-association is found here**

(85) Incidental self-association

- a-(lekh- H aang-a) Σ → a-(lekh-áang-a) Σ [àlèkháàngà]
3S-leave-IPFV-FV ‘s/he leaves’
- y-(eny- H aang-a) Σ → y-(eny-áang-a) Σ [yènyáàngà]
3S-want-IPFV-FV ‘s/he is wanting’

(86) In fact, we predict to find cross-linguistically that self-association in such contexts is **never** banned

(87) Cross-linguistic predictions (*remains to be fully tested*)

	Single exponent: $V_i + \textcircled{H}_i$	Co-exponents: $V_i + \textcircled{H}_j$
a. Locality	Only local association	Non-local association
b. Derivedness	Avoid self-association	Self-association
c. Allomorphy	Insertion/allomorphy involves both	Insertion/allomorphy involves only one or the other

5 SUMMARY

(88) **Focus:** Bipartite morphemes, which involve discontinuous exponence appearing in distinct locations within a domain (e.g. circumfixes)

(89) **Claim:** The two parts constitute separate co-exponents with respect to morphological and phonological behavior

(90) **Predictions:** Each exponent acts like a separate morphological unit for

- **Allomorphy:** Allomorphy (and insertion) only involves one of the exponents, never both
- **Derivedness:** The two exponents act like a derived environment

(91) **Formalization:** Each co-exponent has its own morphological color/index (as opposed to “each morpheme”, as commonly understood)

- ^{ok} $[F] \leftrightarrow / \alpha_i \dots \beta_j /$ two exponents
- * $[F] \leftrightarrow / \alpha_i \dots \beta_i /$ *one discontinuous exponent

(92) **Scope:** The predictions receive (tentative) support from segmental circumfixes as well as bipartite morphemes involving a non-local tonal component and a segmental component

- **Circumfixes:** /gə-...-t/ participles in German
- **Non-local grammatical tone:** / \textcircled{H} ...-aang/ imperfective aspect in Idakho

(93) **Theoretical modification** (to Morphological Color Theory):

- Under this proposal, shared morphological color does not stem from being in the same vocabulary item, but rather denotes a pre-specified constituent independent of the item it is contained in
- If exponents are independent from the vocabulary items, this implies that they might be used recurrently in distinct vocabulary items realizing distinct syntactic feature bundles
- Essentially a morphomic distribution (Aronoff 1994, *inter alia*)

- (94) **Consequences for linearization:** On the “where” of affixation
- Vocabulary items like [F] ↔ / $\alpha_i\beta_i$ / are, of course, **allowed**
 - But, vocabulary items like [F] ↔ / $\alpha_i \dots \beta_i$ / are **disallowed**
 - This suggests that all phonological material of an exponent **must be linearized together** and appear in the same location, at least initially
(*modulo* interrupting morphology like infixation, argued to be derivationally late – Kalin to appear, Kalin & Rolle to appear)
 - See similar statements in Stemberger & Bernhardt (1999) against ‘interdigitation’, and Marušič (2003) and against morphologically-conditioned contiguity violations generally
- (95) The **locus of linearization** is neither the [F] features, nor the co-exponents as a whole, but rather **each individual exponent**
- (96) To close, an analogy: Exponents cannot have ‘**territorial exclaves**’
- Territory that is politically part of a larger country but not physically contiguous with it (i.e. a foreign territory separates it)



6 REFERENCES

See my website: www.nicholasrolle.com

7 APPENDIX

(97) German irregular verbs¹

Infinitive	Meaning	Participle	Infinitive	Meaning	Participle	Infinitive	Meaning	Participle
<i>backen</i>	bake	<i>gebacken</i>	<i>halten</i>	hold	<i>gehalten</i>	<i>schwingen</i>	swing	<i>geschwungen</i>
<i>befehlen</i>	command	<i>befohlen</i>	<i>hängen</i>	hanging	<i>gehangen</i>	<i>schwören</i>	swear	<i>geschworen</i>
<i>beginnen</i>	begin	<i>begonnen</i>	<i>heben</i>	raise	<i>gehoben</i>	<i>sehen</i>	see	<i>gesehen</i>
<i>beißen</i>	bite	<i>gebissen</i>	<i>heißen</i>	called	<i>geheißen</i>	<i>sein</i>	be	<i>gewesen</i>
<i>betrügen</i>	deceive	<i>betrogen</i>	<i>helfen</i>	help	<i>geholfen</i>	<i>senden</i>	send	<i>gesandt</i>
<i>bewegen</i>	move	<i>bewogen</i>	<i>kennen</i>	know	<i>gekant</i>	<i>singen</i>	sing	<i>gesungen</i>
<i>biegen</i>	bend	<i>gebogen</i>	<i>klingen</i>	sound	<i>geklungen</i>	<i>sinken</i>	sink	<i>gesunken</i>
<i>bieten</i>	offer	<i>geboten</i>	<i>können</i>	come	<i>gekommen</i>	<i>sitzen</i>	sit	<i>gesessen</i>
<i>binden</i>	tie	<i>gebunden</i>	<i>kriechen</i>	can	<i>gekonnt</i>	<i>sollen</i>	obliged	<i>gesollt</i>
<i>bitten</i>	request	<i>gebeten</i>	<i>laden</i>	crawl	<i>gekrochen</i>	<i>sprechen</i>	speak	<i>gesprochen</i>
<i>blasen</i>	blow	<i>geblasen</i>	<i>lassen</i>	load	<i>geladen</i>	<i>springen</i>	jump	<i>gesprungen</i>
<i>bleiben</i>	stay	<i>geblieben</i>	<i>laufen</i>	let	<i>gelassen</i>	<i>stechen</i>	prick	<i>gestochen</i>
<i>braten</i>	roast	<i>gebraten</i>	<i>leiden</i>	run	<i>gelaufen</i>	<i>stehen</i>	stand	<i>gestanden</i>
<i>brechen</i>	break	<i>gebrochen</i>	<i>leihen</i>	suffer	<i>gelitten</i>	<i>stehlen</i>	steal	<i>gestohlen</i>
<i>brennen</i>	burn	<i>gebrannt</i>	<i>lesen</i>	lend	<i>geliehen</i>	<i>steigen</i>	rise	<i>gestiegen</i>
<i>bringen</i>	bring	<i>gebracht</i>	<i>liegen</i>	read	<i>gelesen</i>	<i>sterben</i>	die	<i>gestorben</i>
<i>denken</i>	think	<i>gedacht</i>	<i>lügen</i>	lie	<i>gelegen</i>	<i>stinken</i>	stink	<i>gestunken</i>
<i>dürfen</i>	allowed	<i>gedurft</i>	<i>messen</i>	tell lies	<i>gelogen</i>	<i>stoßen</i>	push	<i>gestoßen</i>
<i>empfehlen</i>	recommend	<i>empfohlen</i>	<i>mögen</i>	measure	<i>gemessen</i>	<i>streiten</i>	quarrel	<i>gestritten</i>
<i>erschrecken</i>	frightened	<i>erschrocken</i>	<i>müssen</i>	like	<i>gemocht</i>	<i>tragen</i>	carry	<i>getragen</i>
<i>essen</i>	eat	<i>gegessen</i>	<i>nehmen</i>	must	<i>gemusst</i>	<i>treffen</i>	meet	<i>getroffen</i>
<i>fahren</i>	drive	<i>gefahren</i>	<i>nennen</i>	take	<i>genommen</i>	<i>treiben</i>	force	<i>getrieben</i>
<i>fallen</i>	fall	<i>gefallen</i>	<i>pfeifen</i>	name	<i>genannt</i>	<i>treten</i>	step	<i>getreten</i>
<i>fangen</i>	catch	<i>gefangen</i>	<i>raten</i>	whistle	<i>gepiffen</i>	<i>trinken</i>	drink	<i>getrunken</i>
<i>finden</i>	find	<i>gefunden</i>	<i>reiben</i>	advise	<i>geraten</i>	<i>tun</i>	do	<i>getan</i>
<i>fliegen</i>	fly	<i>geflogen</i>	<i>reißen</i>	rub	<i>gerieben</i>	<i>verbergen</i>	hide	<i>verborgen</i>
<i>fliehen</i>	flee	<i>geflohen</i>	<i>reiten</i>	tear	<i>gerissen</i>	<i>verderben</i>	spoil	<i>verdorben</i>
<i>fließen</i>	flow	<i>geflossen</i>	<i>rennen</i>	ride	<i>geritten</i>	<i>vergessen</i>	forget	<i>vergessen</i>
<i>fressen</i>	eat	<i>gefressen</i>	<i>riechen</i>	run	<i>gerannt</i>	<i>verlassen</i>	leave	<i>verlassen</i>
<i>frieren</i>	freeze	<i>gefroren</i>	<i>rufen</i>	smell	<i>gerochen</i>	<i>verlieren</i>	lose	<i>verloren</i>
<i>geben</i>	give	<i>gegeben</i>	<i>salzen</i>	call	<i>gerufen</i>	<i>vermeiden</i>	avoid	<i>vermieden</i>
<i>gedeihen</i>	flourish	<i>gediehen</i>	<i>scheiden</i>	salt	<i>gesalzen</i>	<i>verschwinden</i>	disappear	<i>verschwunden</i>
<i>gehen</i>	go	<i>gegangen</i>	<i>scheinen</i>	separate	<i>geschieden</i>	<i>versprechen</i>	promise	<i>versprochen</i>
<i>gelingen</i>	succeed	<i>gelingen</i>	<i>schieben</i>	seem	<i>geschienen</i>	<i>verzeihen</i>	pardon	<i>verziehen</i>
<i>gelten</i>	valid	<i>gegolten</i>	<i>schießen</i>	shove	<i>geschoben</i>	<i>wachsen</i>	grow	<i>gewachsen</i>
<i>genießen</i>	enjoy	<i>genossen</i>	<i>schlafen</i>	shoot	<i>geschossen</i>	<i>waschen</i>	wash	<i>gewaschen</i>
<i>geraten</i>	fall into	<i>geraten</i>	<i>schlafen</i>	sleep	<i>geschlafen</i>	<i>wenden</i>	turn	<i>gewandt</i>
<i>geschehen</i>	happen	<i>geschehen</i>	<i>schlagen</i>	hit	<i>geschlagen</i>	<i>werben</i>	advertise	<i>geworben</i>
<i>gewinnen</i>	win	<i>gewonnen</i>	<i>schließen</i>	shut	<i>geschlossen</i>	<i>werden</i>	become	<i>geworden</i>
<i>gießen</i>	pour	<i>gegossen</i>	<i>schneiden</i>	cut	<i>geschnitten</i>	<i>werfen</i>	throw	<i>geworfen</i>
<i>gleichen</i>	resemble	<i>geglichen</i>	<i>schreiben</i>	write	<i>geschrieben</i>	<i>wiegen</i>	weigh	<i>gewogen</i>
<i>gleiten</i>	glide	<i>geglitten</i>	<i>schreien</i>	shout	<i>geschrien</i>	<i>wissen</i>	know	<i>gewusst</i>
<i>graben</i>	dig	<i>gegraben</i>	<i>schweigen</i>	silent	<i>geschwiegen</i>	<i>wollen</i>	want	<i>gewollt</i>
<i>greifen</i>	grasp	<i>gegriffen</i>	<i>schwellen</i>	swell	<i>geschwollen</i>	<i>ziehen</i>	pull	<i>gezogen</i>
<i>haben</i>	have	<i>gehabt</i>	<i>schwimmen</i>	swim	<i>geschwommen</i>	<i>zwingen</i>	compel	<i>gezwungen</i>

¹ Adapted from https://resources.german.lsa.umich.edu/wp-content/uploads/2018/09/irreg_verbs_DNutting.pdf