Suppletive allomorphy precedes phonology: Evidence from Yindjibarndi

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I. Overview

- There is a debate as to whether phonologically conditioned suppletive allomorphy (PCSA) should be analyzed in parallel with 'regular' phonology.
  - The *yes* view (McCarthy & Prince 1993, Kager 1996, Mascaró 2007; in some ways, Wolf 2008, *a.o.*)
  - The *no* view (Paster 2006, Embick 2010, *a.o.*)
  - Some views in between, like the *if they're optimizing* view (Smith 2015).
- **This poster:** a case of partially optimizing PCSA in Yindjibarndi that supports the *no* view.
  Yindjibarndi: Pama-Nyungan, ~320 speakers (Ethnologue), all discussion based on Wordick's (1982) grammar.
- Locative and instrumental case morphemes display a mix of PCSA and regular alternations.
- Under constraint-based analyses, ranking for suppletive allomorphy and other aspects of morpheme distribution are incompatible with the ranking necessary for regular phonology.
- Failure of analyses that integrate the two suggests that PCSA precedes 'regular' phonology.

II. Data

- The discussion here concerns locative case suffix allomorphy in common nouns. (See Fig. 1.)
- There are two basic allomorphs: /-la/ and /-ŋka/. These are suppletive; no known processes change an /l/ to an /ŋk/ or vice versa. Choice conditioned by prosodic and segmental factors.
  - *Mora count* (Fig. 1, (1)): if a word is 3+ moras, /-la/ is chosen.
  - *Identity of word-final segment* (Fig. 1, (2–3)): if a word ends in a consonant, /-la/ is chosen. If a word ends in a vowel, /-ŋka/ is chosen.
- Both suffixes undergo further phonological alternations, according to the stem's shape.
  - For /-la/: in consonant final-words, the initial /l/ hardens and place-assimilates with the stem-final consonant (e.g. /majtan+la/ > [majtan-ta]; Fig. 1, (2–3)).
  - For /-ŋka/: in NCV-final words, the suffix-initial nasal deletes. The resulting singleton /k/ then lenites to [w] (e.g. /wuntu+ŋka/ > /wuntu-ka/ > [wuntu-wa]; Fig 1, (4)).
  - Deletion of the [w] then occurs if it follows [i] or [a].
- Instrumental case allomorphs /-lu/ and /-ŋku/ are distributed in exactly the same way.

III. Relationship between allomorphy and regular phonology

- Can we understand allomorph selection as related to general phonotactic considerations?
- For the aspect of allomorphy that appeals to *mora count*, not really. The division between 2, 3 moras doesn't appear to track any distinctions in stress or footing, for example (see Kager 1996).

Table 1: stress in mora-counting allomorphy

Moras	Form	Footing (suffix bolded)	Stress profile	Allomorph
2	CVV+CV	Basic: (ˈCVV.-¸**CV**) Variant: (ˈCV.V)(-¸**CV**)	(1-**0**) (10)-(2)	/-ŋka/
	CVCV+CV	(ˈCV.CV)(-¸**CV**)	(10-**2**)	
3	CVVCV+CV	Basic: (ˈCVV.CV)(-¸**CV**) Variant: (ˈCV.V)(¸CV.-**CV**)	(10)-(**2**) (10)(2-**0**)	/-la/
	CVCVV+CV	Basic: (CV.ˈCVV)(-¸**CV**) Variant: (ˈCV.CV)(¸V.-**CV**)	(01)-(**2**) (10)(2-**0**)	
	CVCVCV+CV	(ˈCV.CV)(¸CV.-**CV**)	(10)(2-**0**)	

- For the aspect of allomorphy that appeals to the *identity of the word-final segment*, yes. The choice of /-la/ for 2μ consonant-final words helps avoid illicit CCC clusters.
  - Yindjibarndi monomorphemes do not have any CCC clusters. (Wordick p. 14: "consonant clusters only occur in medial position between vowels. Such clusters are all diconsonantal.")
  - CCC clusters also cannot be created at morpheme boundaries. Most (n=10) CC-initial suffixes don't attach to C-final roots. The ones that do have other allomorphs.
- If /-ŋka/ attached to /wiʈaɲ/, the result would be illicit *[wiʈaɲ-ŋka]. Using /-la/ avoids this.

IV. Problems for a parallel analysis

- Let's assume for now that the mora-counting allomorphy can be analyzed with a general preference for [-la], outranked by a preference for [-ŋka] in short words.
- The aspect of allomorphy that appeals to the identity of the word-final segment is more interesting, and plausibly analyzed as an interaction between ***CCC**, **MAX**, and **USE-[ŋka]$_{2\mu}$**.

  ***CCC**: a * for each sequence of three adjacent consonants.

  MAX: a * for each input segment that lacks an output correspondent.

  USE-[ŋka]$_{2\mu}$: constraint preferring /-ŋka/ as locative case morph for 2μ common noun stems.

- To derive suppletion as the response to *CCC, we rank MAX over USE-[ŋka]$_{2\mu}$ (Tab. 1).
- This is however incompatible with the ranking that is necessary to determine which allomorph of /-ŋka/ surfaces (Tab. 2).
- To derive deletion of /ŋ/ after a NCV-final word, I include the constraint ***NCVNC**.
- Since deletion is the attested repair to *NCVNC, USE-[ŋka]$_{2\mu}$ outranks MAX.
- This is a **ranking paradox**! Rankings cannot coexist in a single parallel grammar.
- No clear solution in line with the rest of the phonology.

Tab. 1

wiʈaɲ LOC = /-ŋka/$_i$, /-la/$_j$	*CCC	MAX	USE-[ŋka]$_{2\mu}$
a. wiʈaɲ-ŋka$_i$	*!		
b. wiʈaɲ-ka$_i$		*!	
☞ c. wiʈaɲ-ca$_j$			*

Tab. 2

wuntu LOC = /-ŋka/$_i$, /-la/$_j$	*NCVNC	USE-[ŋka]$_{2\mu}$	MAX
a. wuntu-ŋka$_i$	*!		
☞ b. wuntu-wa$_i$			*
c. wuntu-la$_j$		*!	

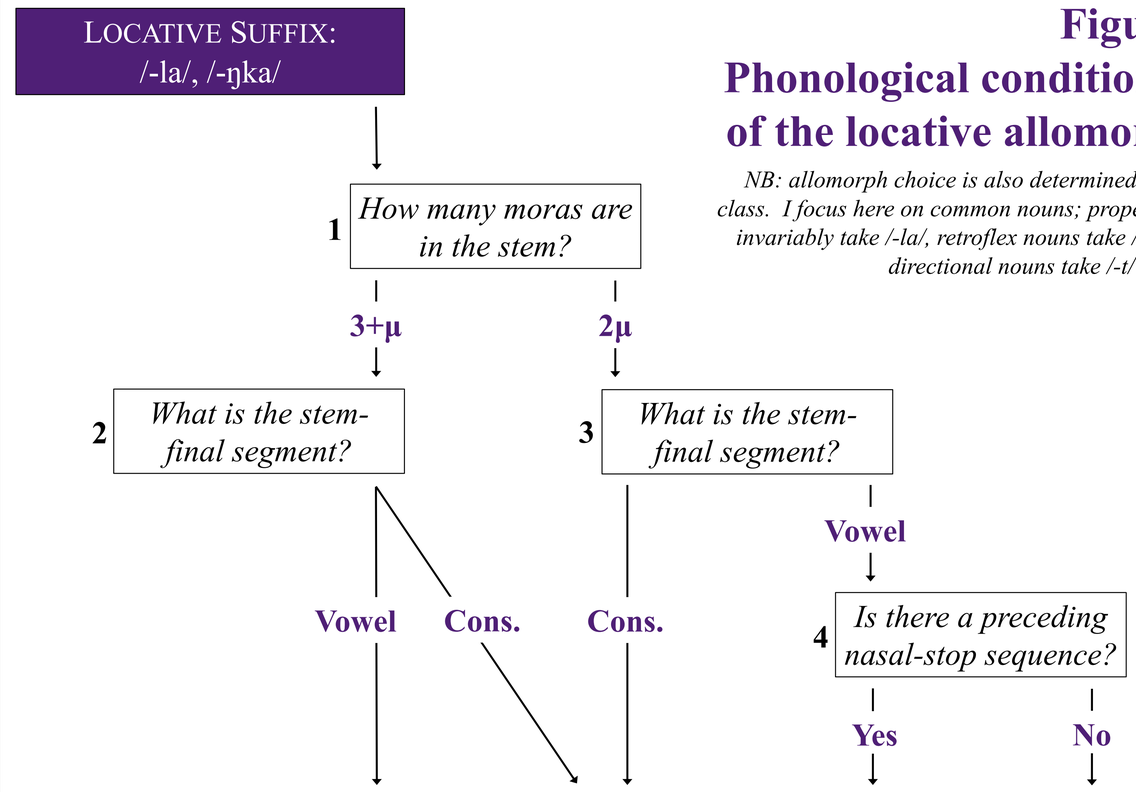

Figure 1
Phonological conditioning of the locative allomorphs

NB: allomorph choice is also determined by noun class. I focus here on common nouns; proper names invariably take /-la/, retroflex nouns take /-ʈa/, and directional nouns take /-t/ or /-ju/ .

Surface realization	[-la]	[-Ca]	[-(w)a]	[-ŋka]
Assumed UR	/-la/		/-ŋka/	
Examples (from Wordick 1982)	loːpu-la 'Friday-LOC'	karwaɳ-ʈa 'summer-LOC'	wuntu-wa 'river-LOC'	malu-ŋka 'shade-LOC'
	kujaː-la 'other side-LOC'	majtan-ta 'my gum tree-LOC'	waɳʈa-a 'stick-LOC'	maɾa-ŋka 'hand-LOC'
	paɾkaɾa-la 'plain-LOC'	wiʈaɲ-ca 'path-LOC'	maɲci-a 'death adder-LOC'	yuɾa-ŋka 'day-LOC'
	yuɾama-la 'soak-LOC'	maɲcaɳ-ʈa 'bed-LOC'	maɳʈa-a 'mountain-LOC'	thaː-ŋka 'mouth-LOC'

V. More problems for constraint-based analyses

- A possible way to save the analysis in §IV is to claim that phonology and morphology are serially interleaved (à la Wolf 2008), with the following order of operations.
  - Morph insertion; allomorph selection is governed by *CCC (*CCC >> USE-[ŋka]$_{2\mu}$)
  - Satisfaction of *NCVNC through deletion (*NCVNC >> MAX), if necessary.
  - Harmonic Serialism's 'one-change-at-a-time' assumption (McCarthy 2010, a.o.) means that, in the insertion step, candidates like [wiʈaɲ-ka$_i$] (with insertion and change) aren't available.
- However: this analysis is doomed as well. Any constraint-based analysis has trouble with related facts regarding the topicalization clitic, /-mpa/. I illustrate with a parallel analysis.
- Just as [-ŋka] alternates with [-(w)a], [-mpa] alternates with [-pa] according to whether or not it is preceded by another nasal-stop sequence.

Table 2: allomorphy of topicalization clitic

Input	/paɽaː+mpa/	/munti+mpa/	/thaŋkaɾ+mpa/
Output	[paɽaː-mpa]	[munti-pa]	[thaŋkaɾ-pa]
Gloss	'long time-TOP'	'really-TOP'	'enough-TOP'

- Problem for constraint-based analyses: suffixation of /-mpa/ to consonant-final stems only occurs if that stem if NCVC-final, i.e. unless satisfaction of *NCVNC would eliminate a C.
- Wordick is extremely clear about this. Apropos of [thaŋkaɾ-pa], he writes (p. 34):

"The reader should understand that this is not simply a reduction of an impossible triconsonantal cluster to a disyllabic [sic] one: the topic clitic will just not fit on words ending in a consonant with no immediately nasal plus stop cluster [...] Gilbert Bobby tells me that the only thing you can do in this case is to use the emphatic clitic in its place."

- My interpretation: it's possible to delete a C in the service of *NCVNC, but not *CCC.
  - Largely parallel to the facts for the locative/instrumental allomorphy discussed earlier.
  - Only difference: those suffixes have other allomorphs that can be deployed. The clitic doesn't; if suffixing /-mpa/ would violate *CCC the word isn't possible.
- As a solution, we try assuming that MAX >> MPARSE (Tab. 3). But this runs into problems, because then the null parse should always be preferred to violations of MAX (Tab. 4).
- This isn't what happens: deletion is fine, *so long as it occurs to satisfy *NCVNC.*

Tab. 3

maɽtaɾ+mpa	*CCC	MAX	MPARSE
a. maɽtaɾ-mpa	*!		
b. maɽtaɾ-pa		*!	
☞ c. ⊙			*

Tab. 4

thaŋkaɾ+mpa	*CCC	MAX	MPARSE
a. thaŋkaɾ-mpa	*!		
☹ b. thaŋkaɾ-pa		*!	
💣 c. ⊙			*

- **The main point**: these data are (at best) difficult to capture in theories in which regular phonology and morpheme selection occur within the same constraint-based grammar.

VI. Implications

- Easy to account for these data if we assume that allomorph selection and morpheme insertion happen in a step prior to regular phonology.
  - /la/ attaches to 3+μ and C-final stems; /ŋka/ attaches to 2μ V-final stems.
  - /mpa/ attaches only to V-final and NCVC-final stems.
  - *NCVNC can then influence the final resulting form; *CCC has no role to play.
- Analysis implementable in several ways (subcategorization, Paster 2006; sublexica, Becker & Gouskova 2016).
- But what seems unavoidable is that *morphological operations precede phonological ones*.