Outward-sensitive Phrasal Allomorphy in Kimatuumbi

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Claim: The interaction between high vowel gliding and initial tone insertion (ITI) in Kimatuumbi has been characterised as countercyclic bleeding and was taken as evidence for countercyclic look-ahead rules and direct reference of phonology to morphosyntactic features (Odden, 1996). I show that it is analysable without look-ahead and with no direct reference if the following assumptions are made: ITI is allomorphy (independently motivated by the data), and phrasal phonological processes can be constricted to phonological words. This feeds into recent discussions of outward-sensitive allomorphy, since the ITI allomorphs are sensitive to the phonological shape of linearly preceding but structurally higher words, which is incompatible with current assumptions about allomorph selection in Distributed Morphology (Paster, 2009; Bobaljik, 2000; Embick, 2010). **Data:** In Kimatuumbi, high vowels turn into glides before other vowels in a process known as gliding. This leads to compensatory lengthening of the following vowel (įV →jVː). Gliding applies between suffixes (1a), 'inner' prefixes and the stem (1b) and 'outer' prefixes and the stem (1c), but not in between words (1d).

(1) a. ak-į-an-a →akjaana
'net.hunt-APPL-REC-FV'

b. lų-até → lwaaté
'CL-banana.hand'

c. ųtįlį́ kų-aanɲú́ → ųtįlį kwaanɲú́
'2SG-run.PFV.SBJV to-firewod'

d. įtabú́ asímįlwá *įtabwáasímįlwá
'borrowed books'

(2) a. pa-nį́-aándįįké → paníáándįįké
'COMP-1SG-write.PFV'

b. ca-tú́-asį́įmé → catwáasį́įmé
'COMP-1PL-borrow.PFV'

c. tų-áandįįke → twáandįįke
'1PL-write.PFV'

(3) a. kįbao g**á**nį
'which stool'

b. kįtumbí́ g**a**nį
'which hill'

(4) ųtįlį kų-aanɲú́ → ųtįlįk**ú́aa**nɲú́
'2SG-run.PFV to-firewod'

Gliding is blocked if two conditions are met simultaneously: if the high vowel has a high tone and the second vowel is long (2a). A high tone or long second vowel alone do not suffice to block gliding (2b-c). Gliding interacts with a process known as Initial Tone Insertion (ITI). Certain elements alternate between a form with a initial high tone and a form without. This affects closed class of elements, chiefly function word and the 'outer' and is roughly conditioned by whether the preceding stem has a high tone or not (3). This is analysed by Odden 1996 with a high-tone inserting rule (hence ITI). The crucial bleeding interaction applies in a context where 'outer' prefix has a high tone due to ITI and is followed by a long vowel. This leads to the high tone appearing on the prefix vowel (4), ITI bleeds thus gliding. **Problem:** The interaction of ITI and Gliding appears to be countercyclic: By adopting cyclicity (as do many phonological frameworks, a.o. SPE (Chomsky & Halle, 1968), LMP (Kiparsky, 1982), cophonologies (Orgun, 1997), Stratal OT (e.g. Bermúdez-Otero 2012), phasal phonology (e.g. Newell 2008)) a process in an inner cycle, e.g. a word sized domain, must precede a process in an outer cycle, e.g. a phrase-sized domain. From this follows that gliding, which is restricted to words, must apply before ITI, which clearly takes in phrasal information, wrongly predicting a counterbleeding interaction. **ITI is not a phonological process:** ITI as a phonological process as analysed by Odden (1996) is both countercyclic and non-modular, because the ITI rule refers to morphosyntactic features and employs a look-ahead mechanism that sees structure outside the current cycle. Given the idiosyncrasies of ITI on both the target (an arbitrary list) and the information necessary to identify triggers (which includes syntactic category and internal morphological bracketing), it is not possible to formulate ITI as a standard phonological process with either rules or constraint interaction. Instead I propose

that ITI is allomorph selection: the morphemes in question have a high and a low toned allomorph. e.g. {kʉ́,kʉ̀}, selected in the adequate phrasal context. **Reanalysis with cyclic phonology:** The interaction can be derived with a cyclic phonological grammar such as Stratal OT, if two assumptions are adopted: a) Gliding is not only a lexical but also a phrase level process, blocked by prosodic word boundaries. The 'outer' prefixes are clitics that integrate into the hosting prosodic word at the phrase level (c.f. Selkirk 1995). b) ITI is not a phonological process but allomorphy, as argued above. Allomorph selection precedes phonological computation on a given cycle (c.f e.g. Paster 2006; Kalin 2020). The analysis is schematically given in (5). At the word level, nothing of interest happens in (5), but gliding must be an active process already here. At the morphological cycle between the word and phrase level, the allomorph for the ITI morpheme is chosen, considering the preceding word. In the phrasal phonology, the ITI morpheme is integrated into the prosodic structure of the noun it precedes, which potentially allows for gliding. However, gliding can be bled by the choice of the high toned allomorph at the previous cycle of morphology. The blocking itself is derived by constraints that protect a mora with a high tone, a mora belonging to a long vowel and a constraint against tone shifting, which outrank the constraint against hiatus. In a constraint-based framework, the bleeding of gliding must be derived serially (even if we can find a phonological derivation for ITI), because there is no natural constraint that could block a ʊtɪ̰lɪ̰ kʊ-aanɟʉ́ → *ʊtɪ̰lɪ̰ k**wáa**nɟʉ́ mapping: There is no faithfulness to an underlying high tone, which is otherwise employed to block gliding here, because the tone is not underlying, and the output structure is otherwise well formed. In a rule-based framework, ITI as a phonological rule could precede gliding at the phrase-level, but this comes with a major cost: A theory that combines extrinsically ordered rules, cycles, and prosody abandons any restriction on cyclic process interaction (cf. Gleim 2024), which are arguably a benefit of cyclic theories. **Discussion:** This analysis succeeds in banishing countercyclicity and reference to morphosyntactic features from phonology, but it relies on innovative morphological assumptions, namely phrasal allomorphy and outward-sensitive allomorphy. Phrasal allomorphy is difficult to implement in a lexicalist framework and rejected by Bermúdez-Otero & Luís (2009) wholesale. They propose to reanalyse any instance of potential phrasal allomorphy as a word-level affixation. Phrasal allomorphy is not as problematic in a postsyntactic theory of morphology such as DM. However, the allomorphy in Kimatuumbi is outward oriented, which makes it incompatible with bottom-up insertion in DM: At the point where an allomorph for an ITI morpheme is selected, the preceding word is not yet spelled out. There have been recent arguments that there are limited cases of outward-sensitive allomorphy (Deal & Wolf, 2017; Rolle & Bickmore, 2022), but they are not phrasal and it remains to be shown whether the approaches to them can extend to Kimatuumbi. The one case that has similar properties is the allomorphy of the article in Welsh (Hannahs & Tallerman, 2006). The analysis proposed by them makes the intriguing assumption that that function words are spelled out after lexical words, which makes the allomorphy outward-sensitive, but cyclic. The case of Kimatuumbi lends further evidence to such an approach.

(5) *Schematic derivation of bleeding*

Word level phonology	
aanɟʉ́	Input
[aanɟʉ́]$_\omega$	Prosodic structure is built
Morphosyntax	
[ʊtɪ̰lɪ̰]$_\omega$ {kʉ́,kʉ̀} [aanɟʉ́]$_\omega$	Concatenation
[ʊtɪ̰lɪ̰]$_\omega$ kʉ́ [aanɟʉ́]$_\omega$	Allomorph selection
Phrase level phonology	
[ʊtɪ̰lɪ̰]$_\omega$ [kʉ́aanɟʉ́]$_\omega$	Prosodification
[ʊtɪ̰lɪ̰]$_\omega$ [kʉ́aanɟʉ́]$_\omega$	Gliding is blocked