Suppletion in Global Perspective

Abstract

This paper describes a system of suppletive alternations that are conditioned by top-down prosodic context. In Mandar (Austronesian), eight heads supplete at the right edge of the phonological phrase to satisfy an output constraint on foot structure. When phrase-external phonological context makes it possible to resolve this output constraint in a more optimal way, these patterns of suppletion are all suspended. These effects suggest that the mechanism which regulates suppletion, vocabulary insertion, must be situated within a phonological calculus that can access global context and respond to output constraints.

Keywords: Suppletion, Optimization, Prosody, Cyclicity, Sulawesi

Related Works: None

1 Introduction

A central discovery of modern work in morphology is that morphosyntactic words are assembled within the morphosyntactic component of a modular, feed-forward grammar (Sadock, 1980; Baker, 1985; Hale & Keyser, 1993; Halle & Marantz, 1993; Marantz, 1997). One of the central questions that emerges from this discovery is linked to the matter of exponence. It is widely assumed that many types of morphosyntactic constituents are paired with exponents from the lexicon at a relatively late derivational stage: in Distributed Morphology (DM; Halle & Marantz 1993), through the operation of Vocabulary Insertion (VI). But what is the nature of the operation that pairs constituents with exponents, and what are the architectural conditions under which it operates?

The goal of this paper is to push forward our understanding of VI by investigating a network of suppletive alternations in Mandar, an Austronesian language of Indonesia. There are eight x^0s in this language that take monosyllabic forms when followed by phonologically overt material in a small postsyntactic domain but supplete to disyllabic forms when they are not. This pattern is shown in the following examples with the root $\sqrt{\text{WHAT}}$: before the adverb *dua* "still," this root takes the monosyllabic form *a* (1a), but when it appears alone before a predicate, it typically takes the disyllabic form *apa* (1b).

(1) *Top-Down Suppletion*

a. { a / a / what } { ɹua / dua / still } { pilloa / pilloa / ring }
'What's still ringing?'

b. { apa / a / what } { pilloa / pilloa / ring }
'What's ringing?'

The investigation of this system will take us deep into the phrasal phonology, as we search for a characterization of its domains and an explanation for its prosodic shape. We will ultimately come to see these alternations as part of an output conspiracy that commandeers VI to satisfy top-down constraints that are keyed to the right edge of the phonological phrase. The result is that the eight suppletive x^0s in this system show the property that Embick 2010 terms *allomorphic vacillation*: when they take positions that would otherwise force suppletion, they are forced to retain their unmarked forms when the larger prosodic context sets up an alternative repair for the driving output constraint. This alternative repair, in turn, implicates a type of phonological displacement that operates according to the classical minimalist logic of Attract (Chomsky, 2001).

These results suggest that the operation of VI must in some cases be able to access phonological information that extends beyond the C-command domains of the x^0s that it targets. This conclusion leads to the hypothesis that VI can target certain heads in the global phonological calculus where high-level prosodic structure is built. In tandem with this result, the facts of allomorphic vacillation suggest that VI can be guided by output-oriented constraints (Mester, 1994; Kager, 1996; Booij, 1998). Together, these results lead to two deeper points at the interface of morphology and phonology. First, they mandate that VI be shifted across the boundary between these modules and rehoused within the phonology. Second and relatedly, they show that this operation does not need to be nested within a word- or phrase-level cycle for many types of x^0s.

The remainder of this paper is structured as follows. Section 2 provides background information on Mandar and lays out the output conspiracy that will drive these effects. Section 3 introduces the alternations of interest and argues that they involve suppletion, then lays out an analysis that situates VI in the phonology. Section 4 extends the argument that VI is guided by output constraints and makes a case for allomorphic vacillation, describing a type of phonological movement on the way. Section 5 concludes.

2 Mandar and the Top-Down Constraint

Mandar is an Austronesian language of the South Sulawesi subfamily, spoken by 400,000 people in West Sulawesi, Indonesia (Grimes & Grimes, 1987). It is a head-initial language and it shows a consistent basic word order of V-S-O-D (verb > external argument > internal argument > applied argument) that is derived by x^0-movement of the verb (Brodkin, 2023). The language has no case-marking and allows for *pro*-drop. Morphologically transitive verbs show ergative agreement and every finite clause contains an absolutive enclitic that indexes the O of a morphologically transitive verb or the sole argument of a morphologically intransitive verb. The verb shows voice alternations which position different arguments to receive absolutive Case, and the absolutive argument always raises covertly to the highest A-position in the clause (Brodkin 2022). The result is a Western Austronesian "voice system" (Guilfoyle *et al.*, 1992; Aldridge, 2004). The basic shape of a Mandar clause is shown in example (2).[1]

(2) *The Shape of a Mandar Clause*

Na-alli-ang	i	[$_S$	iKaco'	]	[$_O$	do	bunga	]	[$_D$	iCicci'	]	o.
3ERG-buy-APPL	3ABS		NAME			that	flower			NAME		there

'Kacho' bought those flowers there for Chichi'.'

Mandar has been the subject of much work in Indonesian by the Language Office of South Sulawesi (Sikki *et al.*, 1987; Muthalib & Sangi, 1991; Friberg & Jerniati, 2000). The word-level phonology of the language has been described in Indonesian by Jerniati 2005 and Pelenkahu *et al.* 1983, and the rules of nasal assimilation are discussed in Pater 1999. The unsourced judgments in this paper have been gathered over five years of work with

[1] GLOSSING: ABS: absolutive, ACC: accusative, AF: agent focus, APPL: applicative, ANTIP: antipassive, ERG: ergative, FUT: future, GEN: genitive, IPFV: imperfective, PFV: perfective. <c> = /t͡ʃ/, <'> = /ʔ/.

Jupri Talib, conducted in Indonesian with occasional use of Mandar. To collect these judgments, the consultant was presented with examples in written pairs, asked to reflect on their pronunciation at a regular speech rate with broad-focus prosody, and then asked to produce each variant repeatedly until it was possible to judge each as *bisa dengan nada biasa* "possible at a regular speech rate," *hanya dengan penekanan khusus* "only possible with narrow focus," or *salah* "incorrect." In the summer of 2023, the generalizations collected in this way were then presented on two occasions to audiences of native-speaker linguists in the Mandar area. In that time it became clear that these generalizations are uncontroversial in Mandar and can be replicated in several related languages in the South Sulawesi subfamily.[2] It is thus my understanding that the data below are representative of the general situation in the prestige variety of Mandar.

2.1 The Phonology of Stranding

Our investigation begins with the phonology of preposition stranding. Mandar is a language in which interrogative WH-words and certain types of foci move to a position in the left periphery (Brodkin, 2020). This process is shown in example (3), where it targets the adverbial WH-word *piraŋ* "when." In all examples below, surface forms will appear in the top line and underlying forms will appear in the second line. The top line will also reflect phonological processes that are sensitive to higher-level patterns of prosodic phrasing, which lenite intervocalic */b d d͡ʒ g/* to *[w ɹ j ɣ]*, delete intervocalic /ʔ/, reduce intervocalic coda /ŋ/ to nasalization, and force total assimilation of coda /ŋ/ before all non-nasal consonants but */b d d͡ʒ g/*. For discussion, see Brodkin 2023.

[2]The languages of the South Sulawesi Subfamily have been described in a larger body of English-language work (Friberg, 1991, 1996; Strømme, 1994; Matti, 1994; Valkama, 1995a,b; Jukes, 2006; Lee, 2008; Kaufman, 2008; Laskowske, 2016; Finer, 1997, 1998, 1999; Béjar, 1999). In this subfamily, similar positional minimality effects exist in at least Mamuju, Ulumanda', Tae', and Enrekang (see also Campbell 1989, 19,143 on Pitu Ulunna Salu); they are absent from Bugis and Makassarese. Much comparative work is required.

(3) *WH-Movement in Mandar*

pirap pe mjakkeʔ ___?
piraŋ pai mi-akkeʔ
when IPFV.3ABS ANTIP-lift

'When did she leave?' Friberg & Jerniati 2000, 178

It is generally possible in Mandar for WH-movement to target the complements of directional prepositions, prompting certain changes in verbal morphology. When P^0s are stranded in this way, they show various types of phonological expansion. The examples below introduce a first case: the P^0 *suŋ* "out" is monosyllabic before overt complements (4a) but typically undergoes vʔ-epenthesis when stranded by WH-movement (4b).

(4) *P-Stranding → Epenthesis*

a. bemme i [$_{PP}$ **sun** [$_{PP}$ di pepattoaŋ]].
bemme i **suŋ** di pepattoaŋ .
fall 3ABS out of window
'It fell out of the window.'

b. a nawemmei [$_{PP}$ **suʔuŋ** ___].
a na-bemme-i **suŋ**
what 3ERG-fall-APPL out
'What did it fall out of?'

A second case emerges around prepositions that have the underlying shape CVV(C), where the first vowel is [*a*] and the second is one of [*i e o u*]. These prepositions coalesce to monosyllabic CV(C) forms before overt complements. This effect is shown below: the P^0 *lao* "to" reduces to *lo* (5a) and the P^0 *sau* "to (oceanward)" reduces to *so* (5b).

(5) *Coalescence*

a. leppa ãl [$_{PP}$ **lo** [$_{PP}$ ɹi wojanna]].
leppaŋ aʔ lao di bo͡ʤaŋ-na
go over 1ABS to in house-3GEN
'I went over to his house." Pelenkahu *et al.* 1983, 191

b. lolo ĩ [$_{PP}$ tarrus **so** [$_{PP}$ ɹi sasiʔ]].
lolonŋ i tarrus sau di sasiʔ
flow 3ABS straight to in sea
'It flows straight to the sea.' Friberg & Jerniati 2000, 304

When these prepositions are stranded by WH-movement, coalescence is typically blocked. The result is that stranded P^{0}s are forced into disyllabism in a phonologically distinct way. The P^0 *lao* takes the form *lao* (6a) and the P^0 *sau* takes the form *sau* (6b).

(6) *P-Stranding → No Coalescence*

a. ne mukiriŋal [$_{PP}$ **lao** ___]?
nai mu-kiriŋ-aŋ lao
who 2ERG-send-APPL to
'Who did you send it to?'

b. na naola [$_{PP}$ **sau** ___]?
na na-ola sau
where 3ERG-go to
'Where did he go to?'

These alternations form part of a broader cross-linguistic pattern: functional heads are often forced to expand phonologically when they are stranded by WH-movement (Selkirk, 1984, 1995a). These alternations are thus similar to those that obtain in English with the P^{0}s *for* and *to*, which take the forms *fr* and *t'* before overt complements in clauses produced at a normal speech rate when the influence of focus is controlled (7a). But when their complements are extracted, these P^{0}s are forced to take larger forms (7b).

(7) *P-Stranding in English*

a. I gave the books **t'**/***to** Harvey.

b. Who'd you give the books ***t'**/**to**?

This generalization on WH-movement, in turn, forms part of a larger generalization on the phonology of stranding (King, 1970; Selkirk, 1984, 1995a; Kaisse, 1985). In Mandar,

it is possible for many P^{0}s to appear in contexts where they take no overt complements. In this case I assume that they are stranded by a process of complement ellipsis, marked below with an underscore. When P^{0}s are stranded in this way, they are routinely forced to take disyllabic forms. Example (8b) shows this effect with the P^0 *suŋ*, which expands to *suʔuŋ*. This effect is mirrored by a similar pattern in English, where many P^{0}s expand in phonologically irregular ways in this context (e.g., *out* is forced to host a diphthong).

(8) *Ellipsis → Same Effects*

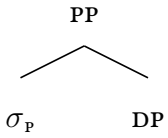
a. bemme i [$_{PP}$ **sun** [$_{PP}$ di tasmu]].
bemme i suŋ di tas-mu
fall 3ABS out of bag-2GEN
'It fell out of your bag.' ([ær])

b. bemme i [$_{PP}$ **suʔuŋ** ___].
bemme i suŋ
fall 3ABS out
'It fell out.' ([æʊʔ])

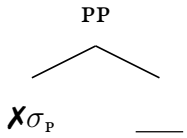
Our investigation thus begins with the observation that Mandar P^{0}s obey a surface constraint on size: when they are stranded, they must take disyllabic forms (9). I will refer to the constraint that drives this effect as the Positional Minimality Constraint.

(9) *The Positional Minimality Constraint*

a. *Overt Complements*



b. *Null Complements*



2.2 The Right-Edge Effect

This generalization forms part of a conspiracy that is roughly keyed to the right edge of the DP. Mandar is a language in which adjectives follow the noun, yielding the

DP-internal order DEM > NOUN > ADJ (demonstrative > noun > adjective). In DPs where the noun is final, nouns are typically forced to take disyllabic forms when they have the underlying shape CVV(C), where the first vowel is [*a*] and the second is one of [*i e o u*]. But when these nouns are followed by adjectives, they coalesce to monosyllablic forms of the shape CV(C). This process is illustrated in the following pair of examples: the noun *bau* "fish" take its disyllabic form when it appears alone at the right edge of the DP (10a), but it reduces to *bo* before the ADJ^0 *pyapi* "curried" (10b).

(10) *Coalescence in the DP*

a. naparessu i **wau**.
na-paressu? i bau
3ERG-cook 3ABS fish
'They just cooked the fish.'

b. naparessu? i **wo** pjapi.
na-paressu? i bau piapi
3ERG-cook 3ABS fish curried
'They just cooked the curried fish.'

These alternations are matched in a second class of CVV(C) nouns whose first vowel is one of [*i u*]. When final in the DP, these nouns take disyllabic forms. But when they are non-final, they reduce to monosyllables through a process that raises [*i u*] to [*j w*]. The following examples illustrate this pattern with *sia* "salt," which takes the disyllabic form *sia* when final in the DP (11a) but the monosyllabic form *sya* before an ADJ^0 (11b).

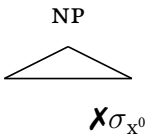
(11) *Gliding in the DP*

a. nanne i **sia**.
na-anna-i i sia
3ERG-add-APPL 3ABS salt
'They added salt.'

b. nanne i **sja** mea.
na-anna-i i sia mea
3ERG-add-APPL 3ABS salt red
'They added red salt.'

These restrictions suggest that the grammar of Mandar contains an output constraint that bans monosyllabic nouns at the right edge of the DP. This constraint can be united with the restriction on prepositions by relativizing this constraint to the right edge of the extended projection of N (Grimshaw, 1991). On this view, both effects follows from the constraint in (12): a ban on monosyllabic x^0s at the right edge of the extended NP.

(12) *The Positional Minimality Constraint: an Interim Reformulation*



This revision allows us to make quick sense of the phonology that we have seen so far. I will assume that coalescence and gliding are driven by the markedness constraint Onset (Itô 1986; Rosenthall 1994; *cf.* Borroff 2007). In an Optimality-Theoretic framework (OT; Prince & Smolensky 1993/2004), these processes can be blocked at the right edge of the extended NP by ranking Onset beneath the Positional Minimality Constraint, which is restated in (13b). This ranking derives the interim result of this section: CVV(C) nouns cannot reduce to monosyllables at the right edge of the DP (13c).

(13) *DP-Internal Restrictions: the Starting Analysis*

a. Onset: assign one violation for every syllable that lacks an onset.

b. Positional Minimality (Pos-Min): assign one violation for every x^0 at the right edge of the DP that is monosyllabic.

c.

naparessu? i [$_{DP}$ bau] 'they cooked the fish'	Onset	Pos-Min
☞ a. naparessu?i { bau }		*
b. naparessu?i { bo }	*!	

We can now turn to the prosodic phonology of the Positional Minimality Constraint. Syntactic constituent structure and category labels should be invisible to the kind of

surface-oriented calculus that governs these patterns of hiatus resolution and epenthesis (Nespor & Vogel, 1986). It would thus be strange if the Positional Minimality Constraint were genuinely formulated in terms of syntactic constituents like the X^0s and the DP.

It is thus unsurprising to observe that the Positional Minimality Constraint operates in a postsyntactic domain that is not exactly identical to the extended NP. Mandar has many elements that surface in second position, splitting syntactic islands and forming clitic clusters that are ordered by syllable count (Brodkin, 2021b). Their behavior is shown below with the quantifier *nasaŋ* "every," which I take to originate in a DP-internal position that is marked with an underscore. In a verb-initial clause, this quantifier shifts left to follow the verb (14a); in an AUX^0-initial clause, it shifts to follow the AUX^0 (14b).

(14) *The Second-Position System*

a. naparessuʔ **nasam** bo mi do wau ___ o.
na-paressuʔ nasaŋ bo mi do bau o
3ERG-cook every again PFV.3ABS that fish there
'She cooked every one of those fish again.' Pelenkahu *et al.* 1983, 158

b. pura **nasam** mi nawaluaŋ ___.
pura nasaŋ mi na-baluaŋ
already every PFV.3ABS 3ERG-sell
'He has already sold every one of them.' Sikki *et al.* 1987, 1097

Many of these second-position elements are parsed into the domain that is relevant for the Positional Minimality Constraint. This can be seen in contexts of WH-movement, which places DPs in positions where they can be followed by second-position elements. When followed by certain second-position elements in this position, these DPs are shielded from the Positional Minimality Constraint. The following examples illustrate this pattern with the quantifier *nasaŋ*, which shifts out of external arguments to follow two types of internal arguments with the shape CVV(C). Before this element, the noun *sia* "salt" reduces to *sya* (15a) and the noun *bau* "fish" reduces to *bo* (15b).

(15) *Second-Position Elements shield DPs from the Edge*

a. **sja nasam** muluppei ___.
sia nasaŋ mu-luppei
salt every 2ERG-forget
'Every one of you forgot salt.'

b. **bo nasam** melo? mwalli ___ a?
bau nasaŋ melo? mu-alli a
fish every want 2ERG-buy eh
'Every one of you wants to buy fish, eh?'

The second-position elements that shield the DP in this way are then subjected to the Positional Minimality Constraint themselves. There are no native nouns in Mandar that synchronically retain the underlying shape (C)V(C), but there are three second-position elements in this system that do. These are *to* "also," *bo* "again," and *a* (a modal). When these x^0s appear before other second-position elements, they take monosyllabic forms (16a). But when they appear after fronted DPs alone, these monosyllabic forms are banned. The adverbs *to* and *bo* are thus typically forced to undergo V?-epenthesis (16b).

(16) *Second-Position Elements show Minimality Effects*

a. jo **to** wandi mitt͡ʃoe?.
jau to bandi miŋ-t͡ʃoe?
I also actually ANTIP-follow
'I'm certainly coming too.'

b. jo **to?o** mitt͡ʃoe?.
jau to miŋ-t͡ʃoe?
I also ANTIP-follow
'I'm coming too.'

The prohibitive modal *a* shows a different response. This x^0 can follow fronted DPs when it is shielded from the right edge by other second-position elements, like *damo* "just" in (17a). But when it is not shielded in this way, it cannot undergo V?-epenthesis

like *to* and *bo*. The result is that its appearance is typically banned outright in clauses that lack additional second-position elements. This ban is shown in example (17b).

(17) *Phonological Blocking*

a. ikat͡ʃo **a** ɹamo mattimbe.
ikat͡ʃoʔ a damo maŋ-timbe
NAME let it not be just ANTIP-throw
'Don't let it be Kacho' who just threw something.' Sikki *et al.* 1987, 439

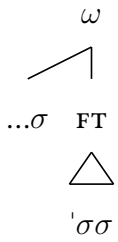
b. *ikat͡ʃo **a(ʔa)** mattimbe.
ikat͡ʃoʔ a maŋ-timbe
NAME let it not be ANTIP-throw
Intended: 'Don't let it be Kacho' who threw something.'

The behavior of second-position elements shows that the Positional Minimality Constraint cannot be keyed to the right edge of the extended NP or any other syntactic domain. Second-position elements cannot move into syntactic positions inside of DPs: not by raising into fronted DPs in the syntax (which would violate the Extension Condition; Chomsky 1993) and not by moving into them in the phonology (which cannot influence syntactic structure). But as they form domains with DPs for the purposes of the Positional Minimality Constraint, we must conclude that the domain of the Positional Minimality Constraint is defined within the postsyntax. This domain is one that must be consistently built around DPs and stranded Ps, in a process of translation that we must understand. It must also be one that takes in certain second-position elements that originate outside the DP, in an interaction that is complex in its own right. And it must be one that shows no trace of cyclicity, in which the Positional Minimality Constraint is evaluated exactly once at a derivational stage where WH-movement and second-position linearization have already taken effect. Our analysis of every operation in the conspiracy of Positional Minimality must then reflect the surface-oriented nature of this constraint.

2.3 The Top-Down Constraint

There is a straightforward way to understand the Positional Minimality Constraint in the surface-oriented terms of the phonology. Mandar is a language that shows regular word-level stress, which is marked with low F^0 and increased length and amplitude. Setting certain prefixes aside, every word hosts one audible instance of stress on the penult (Pelenkahu *et al.*, 1983): thus *óro* "sit," *óroaŋ* SIT-NOMINALIZER "seat," *oroánna* SIT-NOMINALIZER-3GEN "her seat." I propose that this stress pattern arises from the right-alignment of a single disyllabic trochee in the prosodic word (ω), as shown in (18). I assume further that the syllables before the penult are generally not parsed into feet.[3,4] In the examples that follow, I will mark word-level stress overtly in the top line.

(18) *The Disyllabic Trochee*



The phonology of Mandar generally tolerates the emergence of monosyllabic feet. This can be seen from the behavior of CVV(C) nouns, which take monosyllabic forms in

[3] A very similar system is described in the other languages of the South Sulawesi subfamily: regular word-level penultimate stress (Aronoff *et al.*, 1987; Campbell, 1989; Mithun & Basri, 1986; Friberg & Friberg, 1991; Broselow, 1999; McCarthy & Prince, 1994, 1995; Basri *et al.*, 1999, 2012; Jukes, 2006; Laskowske, 2007) and no iterative secondary stress (Campbell, 1989; Friberg & Friberg, 1991; Jukes, 2006). The claim that ωs host one right-aligned trochee follows the universal position of work on other languages of the subfamily (Mithun & Basri, 1986; Friberg & Friberg, 1991; Broselow, 1999; Basri *et al.*, 1999, 2012; Jukes, 2006).

[4] A reviewer asks whether the Positional Minimality Constraint may be derived without reference to feet by a requirement to place the low tone linked to word stress on a different syllable from the final high tone linked to the right edge of the phonological phrase (example 23). This account could derive the facts below by forcing the final word-level stress in the phonological phrase to fall one syllable before the right edge. Nevertheless, the foot in (18) is independently attested in the prosodic morphology of Mandar. There is a pattern of reduplication that copies a two-syllable sequence from the left edge of the base and superimposes trochaic stress on that string (/*balao*/ 'rat' → [*bála-baláo*]), as if to fill out the same disyllabic trochee. I take this pattern to show that this foot exists in Mandar and thus employ it in the analysis below.

phrase-medial positions and bear stress on a par with all other prosodic words. In this context, I assume that these nouns host degenerate feet. The emergence of these feet can be understood to follow from a ranking of ONSET over the pressure that mandates the appearance of the disyllabic trochee in all other positions: namely, the constraint FOOTFORM in (19a). The interaction of these constraints is shown in the tableau in (19b).

(19) *Deriving Monosyllabic Feet*

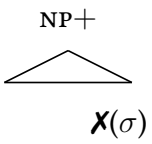
a. FOOTFORM: assign one violation for every foot that is not a disyllabic trochee.

b.

sia mea "red salt"	ONSET	FOOTFORM
☞ a. [$_{\omega}$(sjá)][$_{\omega}$(méa)]		*
b. [$_{\omega}$(sía)][$_{\omega}$(méa)]	*!	

From this perspective, we can reinterpret the Positional Minimality Constraint as a positionally more stringent version of FOOTFORM. On this view, this constraint forces the final overt x^0 in the extended DP to disyllabic because it demands that the final prosodic word contain a disyllabic trochee (20). This reformulation allows us to connect the Positional Minimality Constraint to a range of parallel minimality effects that emerge from constraints on the shapes of feet (Itô & Mester, 1992; McCarthy & Prince, 1993).

(20) *The Positional Minimality Constraint: Second Reformulation*



We can now turn to the matter of domains. In Mandar clauses that do not contain second-position elements, phrasal constituents in the syntax are marked at the surface with a high tone at their right edge. I will refer to this tone as the Phrase-Final High Tone and mark it in all following examples with a superscripted H. Example (21) shows its distribution: it surfaces after every verb, stranded P, phrasal adjunct, and DP.

(21) *The Phrase-Final High Tone*

nalátt͡ʃar^{H}	i	sú?un^{H}	di ɣéna?^{H}	do	sanéke	két͡ʃu?^{H}	ó^{H}.
na-lat͡ʃar	i	suŋ	di gena?	do	sanaeke	ket͡ʃu?	o
3ERG-throw	3ABS	out	in early	that	kid	small	there

'That little kid there threw it out earlier.'

The Phrase-Final High Tone falls on DPs in both postverbal argument positions and in the left periphery (22a). But its position changes when left-peripheral DPs are followed by the second-position elements that shield them from the Positional Minimality Constraint. Example (22b) shows this effect with *nasang* "every": when it follows a fronted DP like *sia* "salt," the H falls after the DP-second-position sequence *syá násang*.

(22) *Second-Position Elements show Minimality Effects*

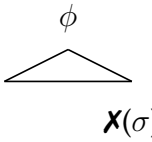
a. **bállo?**^{H} muluppéi^{H}.
ballo? mu-luppei
palm wine 2ERG-forget
'You forgot the palm wine.'

b. **sjá násam**^{H} muluppéi^{H} ___.
sia nasaŋ mu-luppei
salt every 2ERG-forget
'Every one of you forgot salt.'

There is thus a bidirectional connection between the Positional Minimality Constraint and the Phrase-Final High Tone: the positions that show the Positional Minimality Constraint host a Phrase-Final High Tone, and the positions that host a Phrase-Final High Tone show the Positional Minimality Constraint. This is an instance of Domain Clustering, in the sense of Nespor & Vogel 1986: two phonological events pile up in the same position. I take this pattern to suggest that the Positional Minimality Constraint and the Phrase-Final High Tone are both keyed to the right edge of a single abstract phonological domain. I will identify this domain as the phonological phrase (ϕ)

(Selkirk, 1984, 1986; Nespor & Vogel, 1986). This move allows us to reformulate the Positional Minimality Constraint in terms that belong fully to the phonology: in Mandar, the phonological phrase must host a disyllabic trochee at its right edge (23).

(23) *The Positional Minimality Constraint: Final Reformulation*



This connection allows us understand why a Minimality Effect should emerge in this position. Phonological strings are organized into a hierarchical prosodic constituent structure that is built from the universal and layered building blocks of the syllable (σ), foot (FT), prosodic word (ω), phonological phrase (ϕ), and intonational phrase (ι) (Itô & Mester 2007; cf. Hayes 1989; Vogel 1990, 2009). The constituents on this hierarchy provide the domains for phonological evaluation (Selkirk, 1978, 1984, 1986; Nespor & Vogel, 1986; Itô & Mester, 2007, 2012, 2013), and they routinely impose special prosodic requirements on the lower constituents that fall at their left and right edges (Downing, 1998; Booij, 1999; De Lacy, 2001; Parker, 2001; Smith, 2002, 2004a,b). For instance, it is common for the ι to mandate that its leftmost or rightmost ϕ contain multiple daughers—in other words, to branch (Prieto, 2005; Elordieta, 2006). The Positional Minimality Constraint has this same shape: it requires that the final foot in the ϕ contain two immediate daughters, yielding a positional requirement for disyllabism.

The same connection allows us to understand why Minimality Effects should emerge at the right edges of DPs and stranded P^0s. The ω and the ϕ are constructed in response to a pressure to preserve syntactic constituency in the phonology (Selkirk, 1984, 1986, 2009; Selkirk & Tateishi, 1988; Selkirk, 2011; Selkirk & Tateishi, 1991; Selkirk & Shen, 1990; Selkirk, 1995b,a; Nespor & Vogel, 1986). Following Itô & Mester 2019, I will assume that this pressure is one of existential correspondence. At the level of the phrase, it

demands that every XP be placed in correspondence with a ϕ (24a). I assume that the edges of these ϕs are then forced to align with those of their corresponding XPs by the constraints on ALIGNMENT (McCarthy & Prince, 1993; Bennett *et al.*, 2018) in (24b)-(24c).

(24) *The Phrase-Level Mapping Constraints*

a. MAX-XP: Let S be an input syntactic representation and P its corresponding output representation. Assign one violation for every XP in S which does not correspond to a ϕ in P.

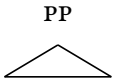
b. ALIGN-L(ϕ-XP): Let S be an input syntactic representation and P its corresponding output representation. Assign one violation for every ϕ in P whose left edge is not aligned with the left edge of a corresponding XP in S.

c. ALIGN-R(ϕ-XP): Let S be an input syntactic representation and P its corresponding output representation. Assign one violation for every ϕ in P whose right edge is not aligned with the right edge of a corresponding XP in S.

These constraints provide us with the machinery to explain the distribution of ϕs. When higher-ranking phonological constraints do not interfere, MAX-XP will force all DPs and PPs to be mapped to ϕs. ALIGN-R(ϕ-XP) will also force the right edges of these ϕs to align with the right edges of their corresponding XPs. This mapping will place the right edges of these XPs in the positions where the Positional Minimality Constraint takes effect, as sketched in the following pair of trees. Focusing on the highest XP and the highest ϕ, the PP *lo ri iAli* "to Ali" in (25a) will be converted to the isomorphic ϕ in (25b).

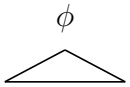
(25) *Mapping PPs to ϕs*

a. *Syntax*



lo ri iAli

b. *Prosody*

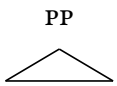


lo ri i(áli)

The same mapping then extends to the context of stranding. When higher-ranking phonological constraints do not interfere, I propose that MAX-XP mandates that PPs be placed in correspondence with ϕs even when their heads are stranded. This proposal fits neatly with the emerging consensus that the mapping constraints force the construction of ϕs around all types of XPs—including those projected by heads that sit above the base of an extended projection (the "functional categories" of Truckenbrodt 1999), as shown by the literature on prosodic recursion (Ladd, 1986; Wagner, 2005, 2010; Elfner, 2015).

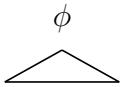
(26) *Mapping PPs to ϕs*

a. *Syntax*



lo ~~*ri iAli*~~

b. *Prosody*



(láo) ___

We are now in a position to derive several finer properties of this system. We can force second-position elements into the domains of the Positional Minimality Constraint by invoking a pressure that outranks the requirement that ϕs be well-aligned with their corresponding XPs. It will suffice to assume that this is one of selection (Inkelas, 1989): these second-position elements have the idiosyncratic property that they must be parsed with their hosts into ϕs that are minimal, not dominating any recursively embedded ϕ (Itô & Mester, 2013) (27a). Its effect is shown in tableau (27c), where it is enforced by the constraint SUBCATEGORIZATION (cf. Bonet *et al.* 2007; Bennett *et al.* 2018). Ranked above ALIGN-R(ϕ-XP), this constaint forces these second-position elements into minimal ϕs with fronted DPs (setting aside many fine questions on second-position linearization).

(27) *Parsing Second-Position Elements*

a. $\{_{\phi[\text{MIN}]}$ … *nasaŋ* $\}$

b. SUBCATEGORIZATION: assign one violation for every vocabulary entry whose phonological subcategorization frame is not satisfied in the output.

c.

sia nasaŋ muluppei "you all forgot the salt"	SUB	A-R(ϕ-XP)
☞ a. {$_{\phi[\text{MIN}]}$ [$_{\omega}$ (śja)][$_{\omega}$*(násam)*]} {$_{\phi}$ [$_{\omega}$ mulupp(éi)] }		*
b. {$_{\phi}$ {$_{\phi[\text{MIN}]}$ [$_{\omega}$ (śja)]} [$_{\omega}$*(násam)*]} {$_{\phi}$ [$_{\omega}$ mulupp(éi)] }	*!	

Pressing further, we can derive the restrictions on hiatus resolution and the requirement for v?-epenthesis from a ranking of the Positional Minimality Constraint over ONSET over DEP. The revised form of the Positional Minimality Constraint is restated in OT terms in (28a); the following tableau shows how it forces v?-epenthesis in the stranded P^0 *suŋ* "out" (28c).[5]

(28) *Deriving v?-epenthesis*

a. ALIGN-R (ϕ,($\acute{\sigma}\sigma$)): assign one violation for every ϕ that is not right-aligned with a disyllabic trochee. (= POSITIONAL MINIMALITY; POS-MIN)

b. DEP: assign one violation for every segment in the output that lacks a correspondent in the input.

c.

bemme i suŋ "It fell out"	MAX-XP	POS-MIN	DEP
☞ a. {$_{\phi}$ [$_{\omega}$ (bémme)]} i {$_{\phi}$ [$_{\omega}$(súʔuŋ)]}			**
b. {$_{\phi}$ [$_{\omega}$ (bémme)]} i {$_{\phi}$ suŋ }		*!	
c. {$_{\phi}$ [$_{\omega}$ (bémme)]} i suŋ	*!		

[5]Puzzles remain around (*i*) the choice of ʔ as the segment recruited to break hiatus and (*ii*) the mechanism that links the quality of the vowels across this segment. Both of these topics have been studied around the parallel process of v?-epenthesis that operates in other languages of the South Sulawesi Subfamily, like Makassarese and Selayarese (Clements, 1986; McCarthy & Prince, 1994, 1995; Gafos & Lombardi, 1999; Broselow, 1999; Kitto & De Lacy, 1999; De Lacy, 2006; Kawahara, 2007; Stanton & Zukoff, 2018).

Finally, we can now explain the lack of cyclic effects in the system of Positional Minimality. It is widely recognized that there is no evidence for cyclicity above the level of the ω (Kiparsky, 1982; Bermúdez-Otero, 2012; Cheng & Downing, 2016). As a result, the literature has long assumed that all prosodic constituents above the ω are built in a single global round of phonological evaluation, in tandem with the evaluation of all phrasal phonology (Selkirk, 1995a, 2009, 2011). This perspective leads us to expect that the distribution of ϕs should only become apparent once the full morphosyntactic derivation is complete. This understanding, in turn, allows us to situate the Positional Minimality Constraint and all of its repairs in this same late derivational stage.

3 Top-Down Suppletion

This understanding of prosodic phrasing and Positional Minimality allows us to turn to suppletion. Realizational theories of morphology typically assume that certain x^0s enter the syntactic derivation without phonological forms (Beard 1987, 1988; Halle & Marantz 1993). In DM, these x^0s are generally assumed to receive phonological forms through the operation of Vocabulary Insertion (VI), which pairs x^0s with vocabulary entries in a process that makes their underlying phonological forms visible (Bobaljik 2000; Embick 2010). VI is standardly situated in a cyclic derivational framework, where it is typically assumed to apply within complex x^0s at intermediate stages that precede the final round of surface phonological evaluation (Bobaljik, 2000). As a result, it is generally held that VI cannot be guided by a surface-oriented phonological calculus that compares between possible outputs and selects among them in an optimizing way (Embick, 2010).

The following sections aim to test this final hypothesis by investigating a network of suppletive alternations that are connected to the conspiracy of Positional Minimality. To do so, we will press on the underlying logic that motivates the existence of VI. Halle &

Marantz 1993 and many later works make a case for this operation that follows the classical logic of underspecification in phonology (Chomsky & Halle, 1968; Archangeli, 1984, 1988; Itô & Mester, 1986; Steriade, 1987; Itô *et al.*, 1995). The argument runs as follows: (*i*) there are derivational stages where the forms of certain x^0s are predictable, and it would be redundant to specify their forms before those stages, (*ii*) the relevant stage is often the morphology, owing to Impoverishment, and so (*iii*) an explanatory theory must situate the choice of forms—and thus VI—no earlier than the morphology.

This logic establishes a rigid conceptual heuristic through which to evaluate the architectural position of VI. If there are cases where the output of VI becomes predictable at a derivational stage that follows the morphology, then it would become redundant to handle VI in the morphology. Two possibilities would then emerge. First, we could continue down the path that led to the postulation of VI and rehouse this operation in this later derivational stage, allowing its outputs to be determined in a post-morphological system. Alternatively, we could abandon this path and drop the notion of late insertion entirely, accepting redundancy into the theory and assuming that the morphology and phonology simply filter an "early-insertion" syntax. There is no internally consistent third option that posits late insertion to capture generalizations on exponence that become predictable in the morphology but shirks responsibility for the generalizations on exponence that only become predictable in the phonology.

Against this backdrop, a clear architectural argument emerges from cases where the output of VI becomes predictable in the phonology. It is common for x^0s to supplete in response to the phonological shapes of syntactically lower x^0s. It is also common for these patterns of phonologically conditioned suppletion to fit into output conspiracies. In Mandar, for instance, the head $appl^0$ is typically exponed as *-aŋ* but suppletes to *-ŋaŋ* after verbs that end in *-a* (29b). This pattern exists alongside a surface constraint which bans sequences of like vowels within the ω, which are generally forced to coalescence

(thus *ma-raras* "ADJ-spicy" but *m-ammis* "ADJ-sweet," *m-asiŋ* "ADJ-salty").

(29) *External Allomorphy: Mandar Applicatives*

a.	taʔbá**ŋaŋ**	peakkéʔ**aŋ**	sió**aŋ**	allí**aŋ**	rannú**aŋ**
	taʔbaŋ-aŋ	peakkeʔ-aŋ	sio-aŋ	alli-aŋ	rannu-aŋ
	cut-APPL	lift-APPL	order-APPL	buy-APPL	hope-APPL
b.	alá**ŋaŋ**	annáŋaŋ	bawáŋaŋ	bat͡ʃáŋaŋ	t͡ʃaritáŋaŋ
	ala-aŋ	anna-aŋ	baba-aŋ	bat͡ʃa-aŋ	t͡ʃarita-aŋ
	take-APPL	save-APPL	bring-APPL	read-APPL	recount-APPL

This alternation thus represents a case of External Allomorphy, in the terminology of Mascaró 1996, 2007: one in which the output of VI becomes predictable in the phonology and can be predicted through independently visible output-optimizing constraints. Cases of external allomorphy have long been argued to show that suppletion must be handled in the phonology (Mester, 1994; Kager, 1996; Tranel, 1996; Perlmutter, 1998; Mascaró, 1996, 2007; Dolbey, 1997; Booij, 1998; Rubach & Booij, 2001; Wolf, 2007, 2008; Bonet & Harbour, 2012; Bennett, 2017). If suppletion proceeds through a single operation of VI (*cf.* Bye & Svenonius 2012), this conclusion demands that VI operate in the phonology as well. The goal of this section is to leverage the conspiracy of Positional Minimality to strengthen the case that VI must be repositioned in this way.

3.1 Stranded Functional Heads

Mandar has a process of NP-ellipsis that is able to strand demonstratives. This process forces stranded DEM^0s to form ϕs of their own, and this is shown with the distal DEM^0 *itiŋ* below. When this DEM^0 surfaces before an overt NP, the two are followed by a single Phrase-Final High Tone. When the DEM^0 surfaces alone, this H falls on the DEM^0 itself.

(30) *Demonstrative Stranding*

aláŋa^{H}	ã	[$_{DP}$	**itim**	búku^{H}	]	/	[$_{DP}$	**ítiŋ**^{H}	___	] .
ala-aŋ	aʔ		itiŋ	buku				itiŋ		
get-APPL	1ABS		that	book				that		

'Get me that book / that.'

Mandar has three other DEM^{0}s that show segmentally irregular alternations across these two contexts. The first is the proximate DEM^0 *ndi* "this (held by speaker)." When this demonstrative appears before an overt NP, it takes the monosyllabic form *ndi* (31a). But when it is stranded by ellipsis, it takes the disyllabic form *indi* (31b).

(31) *Irregular Expansion: Ndi-Indi*

a. mélo^{H} uwéŋan^{H} [$_{DP}$ **ndi** wúku^{H} é^{H}].
melo? o u-beŋaŋ ndi buku e
want 2ABS 1ERG-give this book here
'I want to give you this book.'

b. mélo^{H} uwéŋaŋ^{H} [$_{DP}$ **índi**^{H} ___ é^{H}].
melo? o u-beŋaŋ ndi e
want 2ABS 1ERG-give this here
'I want to give this to you.'

The second and third DEM^{0}s are *de* "this" and *do* "that." Before NPs, these DEM^{0}s retain their monosyllabic forms (32a); when stranded, they expand to *di?e* and *di?o* (32b).

(32) *Irregular Expansion: Do-Di?o*

a. móka?^{H} mála^{H} i [$_{DP}$ **ɪo** sítt͡ʃo?^{H} ó^{H}].
moka a? maŋ-ala i do sitt͡ʃo? o
refuse 1ABS AF-take 3ACC that speck there
'I refuse to take that small amount there.' Sikki *et al.* 1987, 664

b. sápa^{H} muwajaráĩ^{H} [$_{DP}$ **ɪí?o**^{H} ___ ó^{H}]?
saŋ-apa mu-bad͡ʒar-aŋ-i do ___ o
PREFIX-what 2ERG-pay-APPL-APPL that there
'How much did you spend for that thing there?' Friberg & Jerniati 2000, 304

The segmental alternations shown by *ndi, de*, and *do* have almost no parallels in the language. To begin, there is no attested operation of left-edge apocope that would derive the monosyllabic form [*ndi*] from underlying /*indi*/. There is a large class of nouns that begin with the sequence /*ind*/ in Mandar, and there is no context in which these nouns

surface without the initial /*i*/. This restriction is shown with the high-frequency noun *indoʔ* "mother" in example (33a), which must be disyllabic even when non-final in the ϕ. Mandar also has a large class of locative adverbs that are built from the locative pronoun *in* "there" and a *d*-initial locative preposition. The form *indi* is at least historically built from similar syntactic components (*in* "there" + *di* "in"), but its phonological behavior is distinct: these locative adverbs never reduce to forms that begin with [*nd*] (33b).

(33) *No Ind-Apocope*

a. malólo sánnaʔ^{H} i [$_{DP}$ ***(í)ndor** rannúaŋ^{H}].
malolo sannal i indoʔ rannuaŋ
beautiful very 3ABS mother yearning
'The yearning mother (a local waterfall) is really beautiful'

b. máne tándaa^{H} i [$_{ADVP}$ ***(i)nd**ío^{H} / ***(i)nd**íni^{H}].
mane tanda i in-dio in-dini
just arrive 3ABS there-at (far) there-at (near)
'She just arrived thereto (far away) / thereto (close by).'

There is also no attested operation of *di*-reduction that might derive the forms *de* and *do* from underlying /*diʔe*/ and /*diʔo*/. The sequence *di*-V is common in Mandar, and the following example shows that when the phrasal phonology allows this type of hiatus to be resolved, it is handled by gliding (with one exception noted immediately below).

(34) *No Di-V Deletion*
djóm / ***dó**m bándi^{H} di lémbon^{H} **djó**ŋiŋ^{H} / ***dó**ŋiŋ^{H}?
dioŋ bandi di lemboŋ dioŋiŋ
down actually.3ABS in river yesterday
'Was she really down by the river yesterday?'

These alternations have an exact match in the system of VP-ellipsis. Mandar has a realis negator that takes the monosyllabic form *ndaŋ* before overt complements. Example (35a) shows its form in a clause where the subject raises to the left periphery (as contrastive subjects typically do in the context of VP-ellipsis). But it is possible for the negator to be stranded by VP-ellipsis, and there it typically expands to *andiaŋ* (35b).

(35) *Irregular Expansion: Ndaŋ-Andiaŋ*

a. do and͡ʒóro^{H} [$_{PoLP}$ **ndaŋ** ŋúra wéɣa^{H} ó^{H}].
do and͡ʒoro ndaŋ ŋura bega o
that coconut not unripe too there
'That coconut there is not too unripe.'

b. de and͡ʒóro^{H} ŋúra wéɣa^{H} é^{H}, tapi ɹo and͡ʒóro^{H} [$_{PoLP}$ **andíaŋ**^{H} ó^{H}]
de and͡ʒoro ŋura bega e tapi do and͡ʒoro ndaŋ o
this coconut unripe too here but that coconut not there
'This coconut here is too unripe, but that coconut there is not.'

This alternation is once again almost without parallel in the language. There is no process of *and*-apocope that applies to any other root in Mandar, even outside the right edge of the ϕ (thus *ande* "rice" cannot reduce in the DP **(a)nde ressu?* "cooked rice"). In the same vein, there are no grounds on which to postulate a process of *di*-V-Deletion beyond the alternations shown by *de*, *do*, and *ndaŋ*. The negator *ndaŋ* must then be taken to respond to the Positional Minimality Constraint in a segmentally idiosyncratic way.

3.2 Wh-Words

Three more alternations of this type can be found in the WH-system. The root $\sqrt{\text{WHAT}}$ in Mandar takes the monosyllabic form *a* when non-final in the ϕ. This form can be seen in clauses where it is followed by a second-position element, like the adverb *dua* "still" (36a). But when final in the ϕ, it is routinely forced to take the disyllabic form *apa* (36b).

(36) *Irregular Expansion: A-Apa*

a. **á** ɹúa^{H} píllóa^{H}?
a dua piŋ-loa
what still ANTIP-sound
'What's still ringing?'

b. **ápa**^{H} píllóa^{H}?
a piŋ-loa
what ANTIP-sound
'What's ringing?'

This alternation is segmentally without parallel in the language. The phoneme /p/ can appear in intervocalic positions and never reduces in that context in any other x^0. Its status in that position has also been diachronically stable, and every /v*p*v/ sequence in a root inherited from Proto-Malayo-Polynesian survives in Mandar unchanged (37a). The sequence /*apa*/ is similarly unable to reduce in the nearly homophonous c^0 *apaʔ* "because." Even when this c^0 surfaces in the middle of a ϕ, it cannot reduce to *aʔ* (37b).

(37) *No Reduction of /apa/*

a. MANDAR: tapa api sapu
PMP: tapa api sapu
GLOSS: smoke fire wipe

b. maíʔdiʔ^{H} i, **apa** áhaʔ^{H} i.
maiʔdi i apaʔ ahaʔ i
many AGR because sunday AGR
'It was plentiful because it was Sunday.' Friberg & Jerniati 2000, 228

The alternation between *a* and *apa* has direct parallels in the root $\sqrt{\text{WHICH}}$ and the word for *who* (which is at least historically $\sqrt{\text{WHICH}}$ + the animate definite determiner). The root $\sqrt{\text{WHICH}}$ surfaces in the unmarked monosyllabic form *na* when it is non-final in the ϕ (e.g., when it is followed by the second-position element *nasaŋ* "every;" (38a)). But when stranded at the right edge of the ϕ, it typically takes the form *inna* (38b). The word for *who* shows a similar alternation between *ne* (seemingly /*na-i*/) and *inne* (/*inna-i*/). This alternation is once again unique and unparalleled in the language.

(38) *Irregular Expansion: Na-Inna*

a. **ná** násam^{H} mweŋéi^{H}?
na nasaŋ mu-engei
which every 2ERG-be in
'Which place are you guys all in?'

b. **ínna**^{H} bémme^{H}?
na bemme
which fall
'Which one fell?'

The seven irregular alternations across these systems are summarized in table (39). Each of these alternations conforms in prosodic context and effect with the Positional Minimality Constraint: each one operates at the right edge of the ϕ and serves to eliminate monosyllabic feet in that position. In this respect, they are analogous to the suppletive alternations that enable stranded functional x^0s to form licit ωs in English: famously in the auxiliary system, where VP-ellipsis forces the emergence of longer forms (You'd never go, but **I'd* ___/I would ___; King 1970; Kaisse 1985; Selkirk 1995a; Anderson 2008; Itô & Mester 2019) and equally within the DP, where the preposition ə (<of>) takes its unmarked allomorph before overt NPs but suppletes when stranded by WH-movement (give me a cup ə/*ʌv coffee // what did you give me a cup *ə/ʌv ___?).

(39) *Suppletive Monosyllables*

ϕ-medial	ndi	de	do	ndaŋ	a	na	nai
ϕ-final	indi	diʔe	diʔo	andiaŋ	apa	inna	innai
GLOSS	this (closest)	this	that	NEG	what	which	who

3.3 The Label of Suppletion

I propose that the short-long pairs in table (39) are suppletive in the synchronic grammar of Mandar. In other words, I propose that the short form of the root $\sqrt{\text{WHAT}}$, *a*, is not derived from the long form /*apa*/ through any synchronic process of reduction. Instead, I argue that each pair contains two distinct vocabulary entries—an unmarked allomorph and a marked alternative—which are selected in different contexts as the phonology allows. On this view, all of these alternations involve suppletion. As they are

conditioned by prosodic context, I will refer to them as cases of top-down suppletion.

The case for suppletion rests on the following logic. I assume that there is no room in a predictive theory of morphology for the Readjustment Rules of Halle & Marantz 1993. This starting hypothesis follows from four widespread considerations. First, Readjustment Rules are entirely unconstrained and thus undercut the empirical content of theories that employ them (Bermúdez-Otero, 2012). Second, they blur the lines between morphology and phonology in a manner that makes it impossible to investigate the fine architecture of the postsyntax. Third, they are not needed to capture generalizations over subsets of lexical items because it is independently necessary to organize lexical items into subclasses in the phonology to account for lexical stratification and analogous effects in that module (Itô & Mester, 1995). And fourth, there is no way to draw a principled synchronic distinction between alternations that involve Readjustment and alternations that involve suppletion (Haugen & Siddiqi 2013, 2016; Haugen 2016; see also Mel'čuk 1994; Corbett 2007). The result is that there are two ways to understand the alternations in table (39): as synchronic phonology or as suppletion.

We can now build a case against a synchronic phonological analysis. The x^0s that show top-down suppletion in Mandar are not able to take forms that are phonologically intermediary between their short and long forms. This means that the DEM^{0}s *de* and *do* and the WH-word *a* cannot appear in partially expanded forms like *dje*, *djo*, and *aɸa*. This result suggests that the short and long forms of these elements are distinguished categorically, rather than existing along a synchronic derivational cline that makes intermediary forms available when the phonology of focus prevents full reduction.[6]

[6]In this respect, these alternations contrast to some extent with those of English, where a reviewer notes that many auxiliaries can take forms that fall between the two clear extremes (e.g., /*hæv*/-/*həv*/-/*əv*/-/*v*/). This point suggests that some of the alternations in English should be handled in the phonology, either with lexically-indexed constraints or more complex representations. Even so, I believe that it is still possible to maintain the classical position that other alternations in the larger English system do involve suppletion.

Pressing further, we can now observe that these x^0s can be frozen in short or long forms by higher affixes in a manner that blocks later alternations. Mandar has a prefix *ya-* which appears above the $\textsc{dem}^0$s in contexts of overt deixis (cf. Indonesian *yang ini* "this one (pointing)"). I assume that this prefix sits in an x^0 in the extended projection of N^0. It forces the $\textsc{dem}^0$s *de* and *do* to take their short forms, even under stranding (40b).

(40) *Affixal Freezing: do*

a. aláŋa^{H} ã [$_{DP}$ **jaɪo** waláo^{H} ʔó^{H}].
ala-aŋ aʔ ia-do balao o
get-APPL 1ABS DEIXIS-that mouse there
'Get me that mouse there' (pointing to it).

b. aláŋa^{H} ã [$_{DP}$ **jáɪo**^{H} ___ ʔó^{H}].
ala-aŋ aʔ ia-do o
get-APPL 1ABS DEIXIS-that there
'Get me that thing there' (pointing to it).

The root $\sqrt{\textsc{what}}$ shows a similar freezing effect in the presence of the prefix *saŋ-* (*saŋ-apa* "how many") and the verbalizing x^0s that host the prefixes *maŋ-* (*maŋ-apa* "do what"), *ti-* (*ti-apa* "be what"), and *mi-* (*mi-apa* "how"). When this root combines with any of these affixes, it is frozen in the long allomorph *apa* and can no longer take its short form, even when followed by a second-position element within the ϕ (41).

(41) *Affixal Freezing: a*

maã̃pa násа^{H} õ míeʔ^{H} ___?
maŋ-apa nasaŋ o mieʔ
VERBALIZER-what every 2ABS 2PL
'What are all of you doing?'

This type of freezing would be unexpected if these alternations involved genuine phonological derivation, which should not be blocked by higher affixation. But on the view that the forms *de*, *do*, and *apa* are separate vocabulary entries, these patterns fall into place as natural cases of outward-sensitive suppletion triggered by higher x^0s. This result, in turn, suggests that these alternations must be understood as suppletive.

3.4 Vocabulary Insertion in the Phonology

These observations allow us to pin down the position of VI. The suppletive alternations in table (39) are conditioned by the positions of x^0s within the ϕ. The distribution of ϕs is worked out in a late and surface-oriented phonological calculus that follows the morphosyntax. The choice of allomorphs in this system thus becomes predictable at a late phonological stage. From this point, the logic of underspecification leads us to two results. First, VI must be rehoused within the phonology to operate in awareness of prosodic constituency. Second, VI must be allowed to target certain x^0s in a calculus that sees global prosodic information beyond the XPs in which it applies. These conclusions dovetail with the observation that these alternations are output-optimizing to suggest a third result: VI can be directly guided by output constraints. I restate these claims below.

(42) *The Architectural Position of Vocabulary Insertion*

a. Vocabulary insertion must be rehoused in the phonology to access prosody.

b. Vocabulary insertion must target some x^0s in a global phonological calculus.

c. Vocabulary insertion can be guided by output-oriented constraints.

The goal of this subsection is to formalize this proposal and derive the patterns of suppletion and blocking that we have seen so far. We can begin with the theory of allomorph selection. As in DM, I will assume that all possible vocabulary entries that could be inserted into a given x^0 are compared at the stage where VI applies (Halle & Marantz, 1993). I assume further that the vocabulary entries that can be paired with a given x^0 are ordered into a ranked hierarchy of markedness: the vocabulary entry that carries the least contextual specification is the one that is maximally unmarked, and the vocabulary entry with the most contextual specification is the maximally marked. The preference to insert the most unmarked vocabulary entry is enforced in the phonology

by the constraint PRIORITY (Mascaró, 1996, 2007), which formalizes the Elsewhere Condition of Kiparsky 1973 (43a). For the root $\sqrt{\text{WHAT}}$, this constraint enforces the ordering *a* > *apa*. When the Positional Minimality Constraint does not interfere, it forces the insertion of the unmarked *a*. This is shown in the following tableau, where I foreground the application of VI by presenting the inputs in pre-phonological forms.

(43) *The Constraint Priority*

a. PRIORITY: Given an input containing an X^0 that can be realized with the lexically ordered allomorphs $\{M_1, M_2 \ldots M_n\}$ and a candidate that contains M_i, assign as many violation marks as the depth of ordering between M_i and M_1.

b.

$\sqrt{WHAT}$ $\sqrt{STILL}$ *ANTIP-*$\sqrt{SOUND}$ "what's still ringing"	POS-MIN	PRIORITY
☞ a. {$_\phi$ [$_\omega$ (á)][$_\omega$(ɹúa)]} {$_\phi$ [$_\omega$ (píl)] [$_\omega$ (lóa)] }		
b. {$_\phi$ [$_\omega$ (ápa)][$_\omega$(ɹúa)]} {$_\phi$ [$_\omega$ (píl)] [$_\omega$ (lóa)] }		∗!

VI interacts with output constraints in a manner that is determined by the logic of constraint ranking in OT. PRIORITY can dominate output constraints, yielding patterns of suppletion that are not output optimizing or not conditioned by phonological factors at all (Bonet *et al.*, 2007). But output constraints can also dominate PRIORITY, yielding a situation where phonological pressures commandeer VI to force the insertion of phonologically optimal but lexically marked vocabulary entries. This situation is one which implicates a constraint ranking that McCarthy & Prince 1993 refer to as "P > M."

I propose that the suppletive alternations in table (39) are forced by a ranking of the Positional Minimality Constraint over PRIORITY. This ranking forces VI to insert marked allomorphs in the seven X^0s in this system at the right edge of the ϕ to prevent the emergence of monosyllabic feet in that position. This interaction is sketched in the following tableau, which shows the evaluation of a clause that contains the root $\sqrt{\text{WHAT}}$

and no second-position elements before the verb *pilloa* "ring." In this tableau, the constraint PRIORITY favors the insertion of the unmarked vocabulary entry *a*, but the Positional Minimality Constraint demands the insertion of the marked *apa*. The ranking of the Positional Minimality Constraint over PRIORITY forces *apa* to win out.

(44) *Positional Minimality* > *Priority*

$\sqrt{WHAT}$ *ANTIP*-$\sqrt{SOUND}$ "what's still ringing"	POS-MIN	PRIORITY
☞ a. {$_\phi$ [$_\omega$ (ápa)]} {$_\phi$ [$_\omega$ (píl)] [$_\omega$ (lóa)] }		*
b. {$_\phi$ [$_\omega$ (á)]} {$_\phi$ [$_\omega$ (píl)] [$_\omega$ (lóa)] }	*!	

This account thus integrates the suppletive alternations in (39) with the conspiracy of Positional Minimality by rehousing VI in the phonology and allowing it to be guided by output-oriented constraints. In doing so, it captures important generalizations in a precise and restrictive fashion. First, this theory allows us to integrate seven patterns of suppletion under a common phonological rubric: these x^0s take monosyllabic forms in ϕ-medial positions and take disyllabic forms at the right edge of the ϕ. Second, it allows us to connect these seven patterns to visible output constraints in the surface phonology. This step allows us to explain why these alternations operate in the specific prosodic position where they are found. It also makes it possible to explain why these alternations have the shape that they do: monosyllabic x^0s take disyllabic forms at the right edge of the ϕ because monosyllables are banned in that position. Third and finally, it allows us to understand which types of x^0s could and could not supplete in this position (see also Kayne 2019). I have argued that the sole trigger for suppletion at the right edge of the ϕ is a ban on degenerate feet. This commitment leads directly to the prediction that there could not be x^0s that showed suppletion in this position but were larger than monosyllables in their unmarked forms. Naturally, this prediction is correct.

Pressing further, this account allows us to explain a case of phonological blocking

(Raffelsiefen, 1996, 1999, 2004). As we have seen, Mandar has a prohibitive modal *a* which can appear in contexts where it is shielded from the right edge of the ϕ (17a). But at the right edge of the ϕ, it cannot be repaired by vʔ-epenthesis and thus often cannot appear at all. I assume that epenthesis is blocked by the ranking of a lexically-indexed Dep constraint (Pater 2009) over the Positional Minimality Constraint. This sets up a situation where the operation of VI will always yield an output that violates the Positional Minimality Constraint. As such, I propose that VI is phonologically blocked.

This interaction is sketched in the following tableau. I assume that VI is forced to apply by the constraint in (45b), which demands that x^0s be paired with vocabulary entries (cf. Realize Morph; Kurisu 2001). This constraint is ranked beneath the Positional Minimality Constraint, yielding a configuration where VI cannot apply. The result is an analysis that captures the link between blocking and output constraints and fits naturally with the understanding that VI must operate within the phonology.

(45) *Phonologically-Induced Non-Insertion*

a. $\textsc{Dep}_{\textsc{prohib}^0}$

Assign one violation for every segment in the output in the ω that corresponds to the x^0 *a* that does not correspond to a segment in the input.

b. *Elide

Assign one violation for every x^0 that is not subjected to VI in the phonology.

c.

$\sqrt{NAME}$ $\sqrt{PROHIB}$ *ANTIP-*$\sqrt{THROW}$	$\textsc{Dep}_{\textsc{p}^0}$	P-Min	*Elide
a. {$_\phi$ [$_\omega$ i(kát͡ʃo)][$_\omega$*(áʔa)*]} {$_\phi$ [$_\omega$ (mát)] [$_\omega$ (tímbe)] }	∗!		
b. {$_\phi$ [$_\omega$ ikát͡ʃo)] [$_\omega$*(á)*]} {$_\phi$ [$_\omega$ (mát)] [$_\omega$ (tímbe)] }		∗!	
☞ c. {$_\phi$ [$_\omega$ ikát͡ʃo)] ___ } {$_\phi$ [$_\omega$ (mát)] [$_\omega$ (tímbe)] }			∗

4 Allomorphic Vacillation

The theory of VI developed here makes a decisive prediction that emerges from its two essential components. The first of these involves the interaction between suppletion and other repairs to output constraints. If VI can be guided by the Positional Minimality Constraint, then it is conceivable that the x^0s in table (39) will not always be forced to supplete at the right edge of the ϕ if the phonology allows them to satisfy the Positional Minimality Constraint in this position in a distinct and more optimal way.

The second component involves the scale of phonological context that is visible to the calculus of suppletion. If VI can see global prosodic context, then it should be possible for the patterns of top-down suppletion to be sensitive to more information than the position of an x^0 within the ϕ. More specifically, it should be possible for these patterns of suppletion to be conditioned by phonological context outside of the ϕ.

These two components open up the following possibility. The phonology of Mandar may provide another repair to the Positional Minimality Constraint that implicates phonological content outside of the ϕ. This repair may also be treated as more optimal than suppletion in the system of Positional Minimality. If these conditions hold, then this analysis predicts—in a way that others could not—that suppletion may be suspended when ϕ-external context makes possible an alternative repair to the constraint.

Embick 2010 shows that interactions of this type are difficult to find within the ω, where pressures of lexicalization often force output-optimizing patterns of suppletion to gradually generalize across paradigms (Albright, 2002) or accrue pseudo-cyclic shapes (Dressler 1985; Steriade 1999, 2008, cf. Bermúdez-Otero 1999). But these forces do not operate to the same degree in the phrasal phonology, where most x^0s do not co-occur with the frequency to force storage in listed forms (but cf. Hayes 1990). As such, the phrasal phonology may cast more light on the types of effects that phonology permits.

4.1 Syllable Lifting

Mandar has a set of absolutive agreement clitics that usually surface in second-position outside of the minimal ϕ. Their parse is shown in example (46a) with the 3ABS clitic *i*, which follows the ϕ-internal *nasaŋ* and follows the Phrase-Final High Tone. Two surprising effects emerge when these clitics follow ϕ-internal second-position elements that are monosyllabic, like *to* "also." First, the monosyllabic ϕ-internal second-position elements must stop showing their usual repairs to the Positional Minimality Constraint. Second, the absolutive clitics must begin to precede the Phrase-Final High Tone (46b).

(46) *Absolutive Clitics: A Change in Parse*

a. lóppaʔ násaŋ^{H} i.
loppaʔ nasaŋ i
hot every 3ABS
'Every one of them is hot.'

b. lóppat **tó** i^{H}.
loppaʔ to i
hot also 3ABS
'It's also hot.'

The same effect obtains when monosyllabic ϕ-internal second-position elements appear before unfooted syllables of any other type. In clauses where DPs undergo WH-movement, these monosyllabic ϕ-internal second-position elements immediately precede the predicate (the absolutive clitics disappear in an Anti-Agreement Effect; Ouhalla 1993; Baier 2018; Brodkin 2021a). When the following predicate begins in a stressed syllable, the monosyllabic ϕ-internal second-position elements respond to the Positional Minimality Constraint in their usual way and undergo vʔ-epenthesis (47a). But when the following predicate begins in an unstressed syllable, this response must be suspended. At the same time, the initial syllable of the following predicate must begin to precede the Phrase-Final High Tone of the previous ϕ (47b).

(47) *The Suspension of Positional Minimality*

a. ikát͡ʃot **tóʔo**^{H} ɣúru^{H}.
ikat͡ʃoʔ to guru
NAME also teacher
'Kacho' is also a teacher.'

b. ikát͡ʃot **tó** ɣu^{H}rúnna^{H}.
ikat͡ʃoʔ to guru-na
NAME also teacher-3GEN
'Kacho' is also her teacher.'

These effects extend through the system of Positional Minimality. When the P^{0} *suŋ* "out" is stranded before a disyllabic argument by WH-movement, it forms a ϕ and shows vʔ-epenthesis (48a). But when stranded before a trisyllabic argument, it cannot show epenthesis. The first syllable of that argument must also fall into the preceding ϕ (48b).

(48) *The Broader System of Suspension*

a. á mu^{H}besói^{H} **súʔup**^{H} ___ pósa^{H}?
a mu-beso-i suŋ posa
what 2ERG-pull-APPL out cat
'What did you pull the cat out of?"

b. á mu^{H}besói^{H} **súk** ___ ka^{H}lítt͡ʃi^{H}?
a mu-beso-i suŋ kalitt͡ʃi
what 2ERG-pull-APPL out rabbit
'What did you pull the rabbit out of?"

The same pattern emerges around X^{0}s of the shape CVV(C), yielding a complex interaction with coalescence and gliding. The following examples illustrate in the system of complement ellipsis. When the P^{0} *nauŋ* "down" appears before a disyllabic subject, it shows hiatus (49a). But when it appears before a trisyllabic subject, it is forced to coalescence. This operation yields the form *noŋ*, which would seem to violate the Positional Minimality Constraint—but its result is rescued by drawing the initial syllable

of the following subject into its ϕ (49b). The result is an interaction that seems to involve simultaneous evaluation of two distinct processes (Adler & Zymet, 2021).

(49) *Coalescence and a Second Repair*

a. támbus^{H} i **náuŋ**^{H} állo^{H}.
tambus i nauŋ allo
set 3ABS down sun
'The sun went down.'

b. támbus^{H} i **nóŋ** al^{H}lóna^{H}.
tambus i nauŋ allo-na
set 3ABS down sun-3GEN
'The sun went down.'

Cvv(c) nouns trigger the same effect. The noun *sia* "salt" shows hiatus when it appears as an internal argument before a disyllabic applied argument (50a), but must show gliding and pull in a syllable before a trisyllabic applied argument (50b).

(50) *A Systematic Preference*

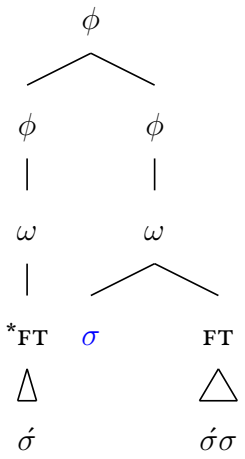
a. wánne^{H} i **sía**^{H} pét͡ʃaʔ^{H}.
u-anna-i i sia pet͡ʃaʔ
1ERG-add-APPL 3ABS salt porridge
'I added salt to the porridge.'

b. wánne^{H} i **sjá** wa^{H}ŕoʔboʔ^{H}.
u-anna-i i sia baroʔboʔ
1ERG-add-APPL 3ABS salt corn porridge
'I added salt to the corn porridge.'

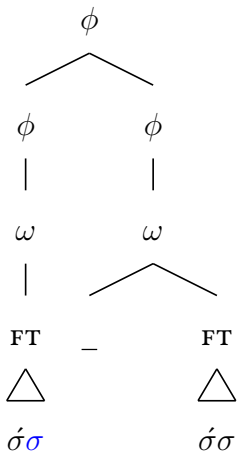
These patterns reveal that there is an additional repair in the system of Positional Minimality that is preferred to many of those that we have seen so far. This is one which creates disyllabic feet at the right edge of the ϕ by drawing in otherwise-unfooted syllables from the left edge of the ϕ that follows. I will refer to this process as "Syllable Lifting." Its essential shape is sketched in the diagram in (51).

(51) *Syllable Lifting*

a. *The Constraint*



b. *The Repair*



The possibility for Syllable Lifting follows naturally from the understanding that the isomorphism between syntactic and phonological constituents is enforced by violable constraints. When a syllable is drawn across ω and ϕ boundaries, it creates misalignment at the right edges of the first ω and ϕ and at the left edges of the second ω and ϕ. These misalignments incur violations of the constraints that mandate isomorphism between syntactic and prosodic constituency, which I assume to be the members of the family Prosody-to-Syntax Align. The ϕ-level versions of these constraints are presented in (24); the ω-level versions are stated in (52). The following tableau shows that Syllable Lifting is forced by the ranking of Dep and Onset over Prosody-to-Syntax Align.

(52) *The Isomorphism Constraints*

a. Align-L(ω-x^0): Let s be an input syntactic representation and p its corresponding output representation. Assign one violation for every ω in p whose left edge is not aligned with the left edge of a corresponding x^0 in s.

b. Align-R(ω-x^0): Let s be an input syntactic representation and p its corresponding output representation. Assign one violation for every ω in p whose right edge is not aligned with the right edge of a corresponding x^0 in s.

(53) *Syllable Lifting: Onset > Align*

$\sqrt{\text{SET}}$ 3ABS $\sqrt{\text{DOWN}}$ $\sqrt{\text{SUN}}$ -3GEN "The sun set."	ONS	A-L(ω)	A-R(ω)	A-L(ϕ)	A-R(ϕ)
☞ a. {$_\phi$[$_\omega$(támbus)]} i {$_\phi$ [$_\omega$(nóŋal)]} {$_\phi$[$_\omega$(lóna)]}		*	*	*	*
b. {$_\phi$[$_\omega$(támbus)]} i {$_\phi$ [$_\omega$(náuŋ)]} {$_\phi$[$_\omega$al(lóna)]}	*!				

4.2 The Suspension Effect

The system of Syllable Lifting opens up a path to test the predictions of the theory developed here. On the view that VI can apply in a global phonological calculus, it may be able to see the phonological shape of the following ϕ when it targets the x^0s in the system of top-down suppletion. On the view that VI can be guided by output constraints, the possibility then emerges that suppletion may be suspended in the contexts where these x^0s can satisfy the Positional Minimality Constraint via Syllable Lifting.

The following examples leverage the system of prefixation to set up the crucial test. In the first example, the root $\sqrt{\text{WHAT}}$ appears before a verb that bears the stressed agent focus prefix *maŋ-*; in the second, the same root appear before a verb that bears the unstressed future prefix *na-*. In this second example, suppletion is indeed called off: $\sqrt{\text{WHAT}}$ must take its unmarked allomorph *a* and the following syllable must be lifted into its ϕ. I will refer to this suspension of suppletion as the Suspension Effect.

(54) *The Suspension Effect*

a. **ápa**^{H} máppaké?de?^{H} i?
a map-pake?de? i
what AF-awaken 3ACC
'What woke him up?'

b. **á** na^{H}máppaké?de?^{H} i?
a na-map-pake?de? i
what FUT-AF-awaken 3ACC
'What will wake him up?'

The Suspension Effect extends through the system of top-down suppletion and emerges in many syntactic contexts that are distinct from the above. The following examples show it before monomorphemic predicates of different phonological shapes. The root $\sqrt{\text{WHICH}}$ suppletes to the marked *inna* before the disyllabic predicate *keccu'* "small," but surfaces in its unmarked allomorph *na* before the trisyllabic *kudarra'* "green."

(55) *The Suspension Effect: Context Two*

a. **ínna**^{H} kétt͡ʃu?^{H}?
na kett͡ʃu?
which small
'Which one is smaller?'

b. **ná** ku^{H}ɹárra?^{H}?
na kudarra?
which green
'Which one is greener?'

The DEM^{0}s in this system show the Suspension Effect in several more syntactic contexts, and the following examples illustrate two. First, the DEM^{0}s surface in their unmarked allomorphs when stranded before postverbal arguments that begin in unfooted syllables (56a). Second, they take their unmarked allomorphs when stranded before trisyllabic verbs, as the result of a syntactic operation that places certain types of absolutive arguments between the v and a preceding AUX^{0} (Brodkin, 2022) (56b).

(56) *The Suspension Effect: More Contexts*

a. nalatt͡ʃári^{H} i **ɹó** ___ ɣu^{H}rúnna^{H} ó^{H}.
na-latt͡ʃar-i i do guru-na o
3ERG-throw-APPL 3ABS that ~~NP~~ teacher-3GEN there
'She threw that at her teacher.'

b. pura^{H} mi **ɹó** ___ um^{H}mánde^{H} ó^{H}.
pura mi do <*um*>ande o
finished PFV.3ABS that ANTIP-eat there
'That one there is finished eating.'

The system of Syllable Lifting also makes it possible to identify an eighth x^0 that undergoes top-down suppletion. This is the evidential adverb *de*, which canonically surfaces in second position, follows the absolutive clitics, and forms a ϕ of its own. When this x^0 surfaces in a position that does not allow Syllable Lifting, it suppletes to the disyllabic form *de?*i (57a). But when it appears before a trisyllabic constituent in a context where Syllable Lifting is allowed, it surfaces instead in its unmarked form (57b).

(57) *An Eighth Case of Top-Down Suppletion*

a. támbus^{H} i **ɪé?i**^{H}.
tambus i de
set 3ABS I GUESS
'It set, I guess.'

b. támbus^{H} i **ɪé** al^{H}lóna^{H}.
tambus i de allo-na
set 3ABS I GUESS sun-3GEN
'The sun set, I guess.'

4.3 The Domain of Evaluation

The existence of top-down suppletion reveals that VI must see the phonological shape of the entire XP and its surrounding phonological phrase when it targets certain x^0s. The Suspension Effect now shows that VI must see more phonological context than this ϕ. To select allomorphs in this system, it is necessary to inspect not just the position of an x^0 in the ϕ but also the metrical organization of the left edge of the following ϕ.

This conclusion suggests that VI must be able to target certain x^0s in a calculus that sees the phonological structure of following XPs. We can now observe that this type of phonological awareness is not constrained by C-command. Within the *voice*P, Mandar requires postverbal arguments to surface in the order VSOD. In this domain, the final D C-commands the preceding O. Evidence for this claim can be found in the system of

variable binding between clausemate arguments, which I take to be constrained by C-command (Reinhart 1983; in Mandar see Brodkin 2022). The arguments that originate above the D, like the S, can always bind into a following D (58a). But the O cannot (58b).

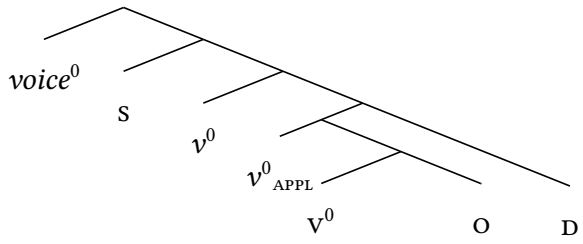
(58) *Internal Arguments originate beneath Applied Arguments*

a. Na-kiring-ang nasang$_i$ i [$_S$ panulis$_i$ ___] buku [$_D$ editor-na$_{i,j}$].
3ERG-send-APPL every 3ABS author book editor-3GEN
'Every author$_{i,j}$ sent her$_i$ editor a book.'

b. U-kiring-ang nasang$_i$ i [$_O$ buku$_i$ ___] [$_D$ panulis-na$_{*i,j}$].
1ERG-send-APPL every 3ABS book author-3GEN
'I sent its$_{*i,j}$ author every book$_i$."

This asymmetry suggests that the O sits beneath the D in ditransitive clauses. This conclusion sets up the following syntax for the Mandar *voice*P: the D is introduced in a rightward specifier of *appl*^{0} (Pylkkänen, 2008) and the O sits beneath it (Brodkin, 2023).

(59) *The Syntax of the Mandar voice*P



This footwork allows us test the relevance of C-command to phonological visibility in the calculus of suppletion. It is possible to strand the demonstratives *ndi, de*, and *do* in the position of the ditransitive O. If these X^{0}s were to undergo VI in a calculus that only contained the phonological forms of the material in the C-command domain of the O, then the choice of allomorph should not be sensitive to the shape of the following D. But this prediction is false. When a DEM^0 is stranded in the position of an O before a trisyllabic D, it fails to supplete and forces Syllable Lifting instead (60).

(60) *Phonological Context ≠ C-Command Domain*

nalattʃári^{H}	i	**ɪó**	___	ɣu^{H}rúnna^{H}	ó^{H}.
na-lattʃar-i	i	do		guru-na	o
3ERG-throw-APPL	3ABS	that	~~NP~~	teacher-3GEN	there

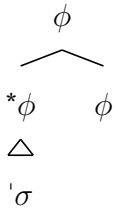
'She threw that at her teacher.'

This effect suggests that VI must see the phonological shape of the full *appl*P when it targets a DEM^{0} stranded in the position of the O. This result then reveals that VI must be able to occur in a calculus that sees the phonological forms of material far beyond the c-command domain of the x^{0} which it targets—and far beyond the c-command domain of the maximal projection in which it lies. In other words, setting the impact of prosodic phrasing aside, there cannot be a strict equivalence between the c-command domain of an x^{0} and the phonological context that can influence VI as it targets that x^{0}.

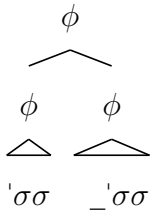
4.4 Output Optimization

The Suspension Effect also shows that VI must be situated in a dynamic phonological evaluation that embeds suppletion within a ranked system of output-oriented repairs. The Suspension Effect strengthens the essential case that top-down suppletion forms part of a conspiracy: the Positional Word Minimality Effect bans degenerate feet at the right edge of the ϕ (61a), the preferred repair is to attract a syllable from the following ϕ (61b), and when this is impossible, the eight x^{0}s in this system supplete (61c).

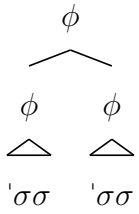
(61) a. *Constraint*



b. *Optimal Repair*



c. *Last Resort*



The following tableau shows the derivation of the Suspension Effect. This effect emerges from the ranking of all Prosody-to-Syntax Align constraints beneath Priority. The result is a system that prefers to respond to the need for a disyllabic trochee at the right edge of the ϕ by repositioning a syllable that would independently be present, rather than inserting an allomorph that would otherwise not be used. In this respect, it forms a morphophonological mirror to the putative syntactic preference to fill needy positions through (External) Merge over Move (Internal Merge; Chomsky 1995).

(62) *Syllable Lifting: Onset > Align*

$\sqrt{\text{WHICH}}$ $\sqrt{\text{GREEN}}$ "which is greener?"	Pri	A-L(ω)	A-R(ω)	A-L(ϕ)	A-R(ϕ)
☞ a. {$_\phi$[$_\omega$(náku)]} {$_\phi$ [$_\omega$(ɹárraʔ)]}		*	*	*	*
b. {$_\phi$[$_\omega$(ínna)]} {$_\phi$ [$_\omega$ku(ɹárraʔ)]}	*!				

In this way, the output-optimizing analysis makes it possible to capture this second generalization on the system of top-down suppletion in a precise and elegant way. In its appeal to output constraints, it allows us to explain why the x^0s in this system can avoid suppletion at the right edge of the ϕ: these patterns of suppletion are altruistic and not driven by the selectional properties of the allomorphs involved. In its appeal to the Positional Minimality Constraint, it allows us to explain why these x^0s avoid suppletion in this context and not in others: suppletion is suspended when the following ϕ begins in an unfooted syllable because that is the context that licenses Syllable Lifting. And by locating vi within the phonology, it allows us to understand why suppletion might be sensitive to top-down prosodic phrasing, xp-external phonological content, and the output constraints that guide this system. In this respect, the output-optimizing analysis rises far beyond the analytical level that could be attained by any theory that handled all phonologically conditioned suppletion by proliferating selectional frames: it is internally coherent, it is concise and restrictive, and it brings us closer to genuine explanation.

5 Conclusion

The conclusions of this study lead toward several shifts in perspective around the broader architecture of the postsyntax. The first surrounds the relationship between VI and the morphosyntax. On the modular and feed-forward theory of the grammar assumed in DM, phonological considerations should not be able to drive operations in the morphosyntax. If VI operates in the phonology, then, it should not be able to feed morphological processes like Fission (Harbour, 2008). On the assumption that there is a modular distinction between phonology and morphology, it follows that such operations must be forced to occur for autonomous morphological reasons (Hewett, 2022). The same logic extends to all types of syntactic movement (*pace* Starke 2009).

The second result lies with the theory of silence. The phonology is now widely recognized to be responsible for suppressing copies in the chains that are created by syntactic movement (Chomsky, 1993), as phonological constraints can determine the positions of the copies that are suppressed (Franks, 1998; Bošković, 2001). In the same vein, Bennett *et al.* 2019 argue that the phonology must be responsible for silencing the constituents that are marked for ellipsis, as phonological constraints can determine the extent of suppression in ellipsis sites. The framework developed here sets up a new path to understand these effects. I have argued that phonological output constraints can block the operation of VI: for instance, the Positional Minimality Constraint and DEP can ban VI into the x^0 that hosts the modal *a*. If chain reduction and ellipsis operate within the phonology, it follows that they must be driven by output-oriented constraints of a similar type. As a result, the possibility emerges that chain reduction and ellipsis may ultimately reduce to analogous cases of phonologically driven suspension of VI.

The third result lies with the theory of the cycle. The framework developed here imposes no intrinsic limit on the amount of phonological context that is accessible at the

derivational moment where VI targets a given x^0. This is an empirically necessary advance, as VI can be conditioned by top-down prosodic context in a manner that extends farther than what we have already seen. Beyond the cross-linguistically routine alternations that emerge when functional x^0s are stranded and forced to form ϕs, it is common for individual x^0s to show patterns of suppletion that are conditioned by their position in the intonational phrase (Kenstowicz, 2005; Henderson, 2012; Royer, 2022). To provide one example, there is a v^0 in Mandar that takes the allomorph *-ì* when it appears at the right edge of the ι (63a). But when this v^0 is not final in the ι, it receives no overt exponent: perhaps suppleting to a null allomorph or perhaps failing to undergo VI (63b).

(63) *Top-Down Suppletion: the Intonational Phrase*

a. {$_\iota$ á mu^{H}páŋíno**ì**^{H} }?
a mu-paŋino-i
what 2ERG-play-TRANSITIVE
'{$_\iota$ What are you playing }?'

b. {$_\iota$ á mu^{H}páŋíno___^{H} djoŋiŋ^{H} }?
a mu-paŋino-i dioŋiŋ
what 2ERG-play-TRANSITIVE yesterday
'{$_\iota$ What were you playing yesterday }?'

In the same vein, the framework developed here imposes no requirement that VI apply in a serial fashion. This too is a necessary step, as there are many cases where VI appears to apply to multiple x^0s in parallel within narrow syntactic domains. The most obvious cases of this type are ones that involve outward-sensitive phonologically conditioned suppletion, in which VI appears to be influenced by phonological features of a higher head x^0 when it targets a lower head y^0 (Svenonius, 2013; Deal & Wolf, 2017; Rolle & Bickmore, 2022). A particularly dramatic example of this effect comes from French, where Swiggers 1985 presents the following paradigm: the root $\sqrt{\text{EGG}}$ is realized in its plural form as *ø* after DP-internal x^0s that end in /*z*/ and in all other contexts as *œf*

(Swiggers 1985 also claims that speakers avoid pronouncing this root after *neuf* "nine," where its appearance is plausibly blocked in the phonology by a double-œuf constraint).

(64) *Outward-Sensitive Phonologically Conditioned Suppletion* French; Swiggers 1985

a. *les* /**ø**/, *des* /**ø**/, *trois* /**ø**/, *six* /**ø**/, *dix* /**ø**/
the eggs some eggs three eggs six eggs ten eggs

b. *quatre* /**œf**/, *cinq* /**œf**/, *sept* /**œf**/, *huit* /**œf**/
four eggs five eggs seven eggs eight eggs

These conclusions thus raise a network of questions on the interpretation of earlier work on suppletion in DM. The tendencies that were once taken to reveal cyclicity in VI may be amenable to reanalysis in terms of the standard machinery of post-cyclic phonology: reference to prosodic structure (Selkirk, 1984; Inkelas, 1989) and constraints on output-output faithfulness (Benua, 1997) and paradigm uniformity (Burzio, 1994; Kenstowicz, 1997; Steriade, 1999; Albright, 2002). Syntactic locality conditions on suppletion, such as those noted by Embick 2010 and Merchant 2015, may be integrated into the growing literature on how the phonology may be sensitive to the fine syntactic properties of its inputs (Cheng & Downing, 2016). All cases of suppletion that are not output-optimizing, in turn, can be linked to other phonological systems that cannot be derived through the logic of optimization (e.g,. tone circles; Moreton 1999; Barrie 2006).

Against this backdrop, the status of the cycle rises to center stage. As phonological theory began to address the types of top-down interactions discussed here, it began to move past the cycle and shift toward global and parallel frameworks (Prince, 1975; Dresher, 1983). As the theory of suppletion begins to grapple with the same domain, it may arrive at the same result. As an alternative, some role for the cycle may persist: for instance, to capture phonologically conditioned alternations that are surface-opaque (Embick, 2010; Kalin, 2020). On a theory that espoused some type of cycle, such as one couched in Stratal OT (Bermúdez-Otero, 1999; Kiparsky, 2000), it would then become necessary to work out a framework that allowed for the top-down interactions above.

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