Interaction of Phonology and Morphology in Maltese and Makassarese Clitics

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Abstract

This paper presents two case studies in which surface phonological form is determined by an interaction of phonological and morphological information and processes. In both Makassarese (South Sulawesi, Austronesian) and Maltese (Semitic) the attachment of certain clitics to a host results in an asymmetry in phonological behavior. The phonological form of these host-clitic structures is sensitive to both the morphology of the clitic (that is, not all clitics show this behavior) and to the phonological shape of the host. To analyze this data, I propose a framework, following Distributed Morphology (Halle and Marantz 1993, et. seq.), in which the triggers for the application of phonological processes are specific morphosyntactic structures and processes. One such morphosyntactic process, Local Dislocation, is known to be conditioned by phonological information about the objects to which it applies. The interleaving of Vocabulary Insertion, which results in available phonological material, Linearization and Local Dislocation result in a framework which has a complicated but restricted interaction of phonological and morphological information. With this framework, the data in the case studies can be explained with one simple morphological process and a few simple phonological rules.

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1 Introduction

This paper presents two case studies in which surface phonological form is determined by an interaction of phonological and morphological information and processes. In both Makassarese (South Sulawesi, Austronesian) and Maltese (Semitic) the attachment of certain clitics to a host results in an asymmetry in phonological behavior. The phonological form of these host-clitic structures is sensitive to both the morphology of the clitic (that is, not all clitics show this behavior) and to the phonological shape of the host.

Many theories of the interface between morphology and phonology claim that these modules of grammar are unable to access information from each other. Strict separatists (e.g., Bye and Svenonius 2012) claim that phonology unable to use any morphosyntactic information and that the output of morphology must be purely phonological in order to serve as input to phonology. Other theories, such as Lexical Phonology (Mohanan 1986, *et. seq.*) and its Optimality Theoretic skin Stratal OT (Bermúdez-Otero 2012), rely on indirect reference between the morphology and phonology by organizing an architecture of levels or strata of morphology which are interleaved with the application of phonological processes. In both of these types of theories, however, it is difficult to explain the particular sensitivity to phonology and morphology in the case studies.

Following the general framework of Distributed Morphology (Halle and Marantz 1993, 1994, *et. seq.*), I propose that the triggers for the application of phonological processes are specific morphosyntactic structures and processes. One such morphosyntactic process, Local Dislocation, is known to be conditioned by phonological information about the objects to which it applies. The interleaving of Vocabulary Insertion, which results in available phonological material, Linearization and Local Dislocation result in a framework which has a complicated but restricted interaction of phonological and morphological information. With this framework, however, the data in the case studies can be explained with one simple morphological process and a few simple phonological rules.

2 Proposed Framework

I propose that the application of phonology in sets of (possibly different) phonological rules (i.e. levels, cycles, strata, etc.) are directly related to the morphosyntactic structure. The morphological units to be referred to are M-Word and Subword:

(1) Definition of M-Word and Subword (Embick and Noyer 2001)
   a. M-Word: (Potentially complex) head not dominated by further head-projection (cf. Chomsky (1995) "H0max")
   b. Subword: Terminal node within an M-Word (i.e. either a Root or a feature bundle)

The interface of morphosyntax and phonology is proposed as follows: (1) morphosyntactic structure is built up, (2) terminal nodes are filled in with phonological material via Spell-Out, and (3) Spell-Out of the M-Word structure of a category-defining head (e.g., *n*, *v*, *a*) triggers a pass of phonology. I will refer to this particular pass of phonology as the "M-Word level phonology." This is analogous to word level phonology in other theories.

This proposal will follow the cyclic spell-out of the $\mathbb{C}_1$-LIN theory, argued for in Embick 2010, which states that when a cyclic head is merged nodes in the complement of that head are sent to spell out. Spell-Out is proposed to work in two steps: (1) Vocabulary Insertion happens (presumably inside out) and (2) phonological cycles are triggered by spelling out the maximal projection of a category-defining head

In addition to the initial morphosyntactic trigger for running the M-Word phonology, I also propose that late morphological movement by, for example, Local Dislocation, causes another pass

of the M-Word phonology (that is, the same set of phonological processes). This particular point will be discussed in more detail in the case studies below.

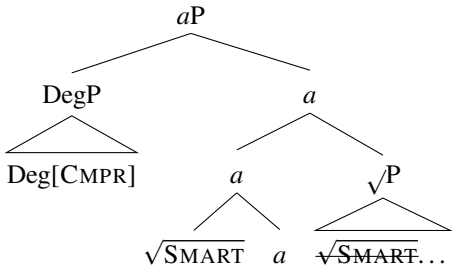
2.1 Local Dislocation and Phonological Sensitivity

Embick and Noyer (2001) propose a morphological movement operation called Local Dislocation, in which, under the relevant conditions, linearly adjacent elements from the syntactic output are moved during Linearization in a way that reflects morphophonological (rather than syntactic) boundaries. Local Dislocation takes elements that are adjacent at the M-Word level and concatenates them at the Subword level (in either order), as schematized in (2).[1]

(2) Schematic of Local Dislocation
$[\ X\ ]_M{}^\frown[\ Y\ ]_M \rightarrow [\ (X \oplus Y)_{Sub}\ ]_M$ *or* $[\ (Y \oplus X)_{Sub}\ ]_M$

For example, Embick (2007a) analyzes the difference between synthetic and analytic forms in English comparative and superlative adjectives as a difference in the application of Local Dislocation. In English comparative and superlative adjectives, the Deg head and the root+adjective complex head are brought into linear adjacency by the syntax (3a) and, in the synthetic cases, the process of Local Dislocation causes the Deg head to move down into the Subword of the root (3b).

(3) a. Structure of Comparative "smarter" (Embick 2007a, p.10)



b. Linearization and Local Dislocation of Comparative "smarter" (Embick 2007a, p.13)
$[\ \text{Deg[CMPR]}\ ]_M{}^\frown[\ \sqrt{\text{SMART}}\ ]_M \rightarrow (\sqrt{\text{SMART}} \oplus \text{Deg[CMPR]})$

Critically, the application of Local Dislocation for this case must be sensitive to the phonology of the M-Words it is manipulating; Local Dislocation occurs with adjective roots of certain phonological shapes[2] (the synthetic comparatives, e.g., *smart-er*) but not with others (the analytic comparatives, e.g., *more intelligent*).

In order to prevent the application of Local Dislocation to adjectives which take the analytic form (*more intelligent*), the Local Dislocation rule must be sensitive to the phonology of a specific component in the linearization, namely the adjective root, as formalized in (4).

(4) English comparative/superlative Local Dislocation Rule (Embick 2007a, p.25, ex.50)
$\text{Deg[CMPR,SPR]}{}^\frown[\ldots X \ldots a] \rightarrow [\ldots X \ldots a] \oplus \text{Deg[CMPR,SPR]}$
where the phonological form of $[\ldots X \ldots a]$ meets the prosodic condition

In order to be sensitive to the phonology of the root (or root+*a* complex), there must be some phonological representation attached to the root node at the time of application of Local Dislocation. This means that the adjective root must have previously undergone Vocabulary Insertion. Under the $\mathbb{C}_1$-LIN theory of Spell-Out, the $\sqrt{}$P would have undergone spell-out when the *a* head was

[1] I will be following the notational convention of Embick (2007b) the symbol $\oplus$ is used to represent concatenation of Subwords and the symbol $^\frown$ is used to represent the concatenation of M-Words.

[2] Here, prosodic shapes, although Embick (2007a) notes that the conditioning of synthetic vs. analytic forms is not strictly prosodic with disyllabic adjectives showing both forms and other factors causing variability for speakers. There is, however, a generalization that monosyllabic adjectives are synthetic and trisyllabic adjectives are analytic suggesting that the prosody of the root (or root+*a*) plays at least some part in the determination of the form and thus the application or non-application of Local Dislocation.

merged, resulting in the phonological form of the adjective root being available for reference for Local Dislocation. The derivation of *smarter* is given in (5):

(5) Derivation of *smarter*

1. Merge of *a* triggers Spell-Out of $\sqrt{}$P
   (a) Vocabulary Insertion at $\sqrt{}$P: [$\sqrt{\text{SMART}}$, /smɑɹt/]
2. Movement of $\sqrt{\text{SMART}}$ to *a*
   (a) Linearization: [[$\sqrt{\text{SMART}}$, /smɑɹt/] ⊕ *a*]$_M$
3. Merge of DegP; higher cyclic head triggers Spell-Out of DegP and *a*
   (a) Linearization: [Deg[CMPR]]$_M$⌢[[$\sqrt{\text{SMART}}$, /smɑɹt/] ⊕ *a*]$_M$
   (b) Local Dislocation: [([$\sqrt{\text{SMART}}$, /smɑɹt/] ⊕ *a*) ⊕ Deg[CMPR]]$_M$
   (c) Vocabulary Insertion: [([$\sqrt{\text{SMART}}$, /smɑɹt/] ⊕ [*a*, ∅]) ⊕ [Deg[CMPR], /ɚ/]]$_M$
   (d) Output: /smɑɹt-ɚ/

The interaction of Local Dislocation with Vocabulary Insertion and passes of the phonology will be used in the analysis of the case studies below.

2.2 Summary of Framework

For the case studies below, the critical aspects of the framework are summarized in (6):

(6) Critical Aspects of Framework

a. Cyclic heads cause Spell-Out of their complements ($\mathbb{C}_1$-LIN)
b. Spell-Out of the M-Word structure of a category-defining head causes a pass of the M-Word Phonology
c. Local Dislocation of an element into an Spelled-Out M-Word (via Local Dislocation) causes the M-Word phonology to run again.

The rerunning of the phonology (6c), as well as the other aspects will be demonstrated in the case studies below.

3 Case Studies

3.1 Makassarese Adjectives and Clitics

3.1.1 Data

In Makassarese, when a suffix or clitic attaches to an adjective there are three different patterns of stress, as shown in (7). By default, the stress falls on the penultimate syllable, as seen in the adjective stem (7a).[3] When a suffix is added, such as the comparative suffix /-aŋ/, stress shifts to the new penultimate syllable, as in (7b). Some clitics, such as the absolutive clitic, have no effect on the stress and appear simply to lean onto the stem without any modification, as shown in (7c). With the determiner clitic, however, there is an assymetry in stress placement between consonant-final (C-final) and vowel final (V-final) stems, with stress shifting in V-final stems but not in C-final stems, as shown in (7d).

[3]The basic stress pattern in Makassarese is obscured somewhat by stems that end in consonants other than /ŋ/ or /ʔ/, which undergo epenthesis of /Vk/. This epenthetic material is not part of the domain of stress, however, allowing for main stress to actually fall as far back as four syllables from the right edge, such as in *rántasakaʔ* "I am dirty" from stem /rantas/. Besides the fact that there is this epenthetic material, these stems behave just like stems ending in licit final consonants and do not have stress shift with the determiner clitic. See Basri et al. (2000) for more detail on the data.

(7) Makassarese adjectives, comparatives, absolutives and determiners (Basri et al. 2000)

	C-final /gassiŋ/	V-final /lompo/	
a. Adjective stem	gá̲ssiŋ "strong"	ló̲mpo "big"	
b. Comparative Suffix /-aŋ/	gassí̲ŋ-aŋ "stronger"	lompó̲-aŋ "bigger"	← stress shift
c. Absolutive Clitic /-aʔ/	gá̲ssiŋ-aʔ "I am strong"	ló̲mpo-aʔ "I am big"	← no stress shift
d. Determiner Clitic /-a/	gá̲ssiŋ-a "the strong . . . "	lompó̲-a "the big . . . "	← asymmetrical

3.1.2 Analysis

The comparative suffix is part of the initial M-Word structure,[4] as schematized in (8a), and thus is part of the domain of stress for the assignment of penultimate stress at the M-Word level phonology. The absolutive clitic, on the other hand, seems to lean onto its host, but does not participate in the M-Word phonology of the host (i.e., is not part of the domain of stress). This is to be expected of a morphosyntactic node that is not part of the same M-Word (8b).

The key problem in this data, however, is that the determiner clitic behaves asymmetrically. When it attaches to C-final stems it behaves like the absolutive clitic (causing no change in stress), but when it attaches to V-final stems it behaves like the comparative suffix (causing a change in stress).

I propose that this is a variable application of Local Dislocation and reapplication of the M-Word phonology in the cases where Local Dislocation applies. That is, Linearization of the syntax outputs a structure identical to that with the absolutive clitic (8c), and, in cases with C-final stems, the derivation is identical. When attaching to V-final stems, however, the Makassarese determiner Local Dislocation Rule (9) applies, causing the determiner to move into the M-Word structure and the M-Word phonology to run again.

(8) Morphological Structures of Makassarese suffix and clitics

a. Comparative: $[\ (\ \sqrt{\text{root}} \oplus a\ ) \oplus \text{Deg}[\textsc{Cmpr}]\ ]_M$

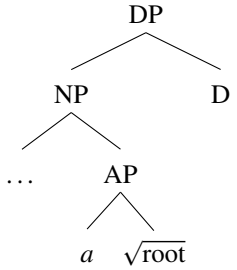
b. Absolutive: $[\ \sqrt{\text{root}} \oplus a\ ]_M \frown [\ \textsc{Abs}\ ]_M$

c. Determiner: $[\ \sqrt{\text{root}} \oplus a\ ]_M \frown [\ \text{D}\ ]_M$
- Subject to Makassarese determiner Local Dislocation Rule (9)

(9) Makassarese determiner Local Dislocation Rule
$[\ \sqrt{\text{root}} \oplus a\ ]_M \frown [\ \text{D}\ ]_M \rightarrow [\ (\ \sqrt{\text{root}} \oplus a\ ) \oplus \text{D}\ ]_M$
where the phonological form of $[\ \sqrt{\text{root}} \oplus a\ ]_M$ ends in a vowel

The proposed structure of the Makassarese DP is given in (10). Under the $\mathbb{C}_1$-LIN hypothesis, the NP (and AP) will undergo Spell-Out and Vocabulary Insertion when the cyclic D head is merged, but the D does not (until the next cyclic head is merged). Thus, the phonology of the adjective is available for reference during the linearization phase of the morphology and can be used as a condition for application of Local Dislocation.

(10) Proposed structure for DP with NP(+AP) complement in Makassarese



[4] Assuming that in the comparative in Makassarese, unlike English, the root and *a* heads undergo syntactic movement to the Deg head, and thus the comparative suffix is part of the morphosyntactic M-Word.

Using only a basic footing and stress rule[5] (11) along with Local Dislocation, the Makassarese facts can be explained.

(11) Makassarese Stress and Footing: "Build trochees right to left."

The derivation of *lompóa* "the big ..." is shown in (12). When D is merged, the NP is spelled out and undergoes a pass of M-Word phonology. When a higher cyclic head is merged and D is spelled out, it undergoes Local Dislocation to concatenate at the Subword level to the previously spelled out NP. This triggers a second pass of the M-Word phonology which causes the stress to shift to the new penultimate syllable.

(12) Derivation of Makassarese *lompóa* "the big ..."

1. Merger of D triggers Spell-Out of NP
   (a) Linearization: ... [$a \oplus \sqrt{\text{BIG}}$]$_{\text{M}}$,
   (b) Vocabulary Insertion: ... [[a, $\emptyset$] $\oplus$ [$\sqrt{\text{BIG}}$, /lompo/]]$_{\text{M}}$
   (c) Input to M-Word Phonology: lompo
   (M-Word) Stress and Footing (lómpo)
2. Merger of higher cyclic head causes Spell-Out of D
   (a) Linearization: [/(lómpo)/]$_{\text{M}}$⁀[D]$_{\text{M}}$
   (b) Local Dislocation: [/(lómpo)/ $\oplus$ [D]]$_{\text{M}}$
   (c) Vocabulary Insertion: [/(lómpo)/ $\oplus$ [D, /-a/]]$_{\text{M}}$
   (d) Input to M-Word Phonology: lompo-a ← second pass of M-Word phonology
   (M-Word) Stress and Footing lom(póa)
   (e) Output: *lompóa*

In the derivation of *gássiŋa* "the strong ..." (13), however, Local Dislocation does not apply because it is conditioned on the final segment of the host being a vowel. Because Local Dislocation does not apply, there is no second pass of the M-Word phonology and the stress remains on the initial syllable as was assigned during the first pass of the M-Word Phonology.

(13) Derivation of Makassarese *gássiŋa* "the strong ..."

1. Merger of D triggers Spell-Out of NP
   (a) Linearization: ... [$a \oplus \sqrt{\text{STRONG}}$]$_{\text{M}}$,
   (b) Vocabulary Insertion: ... [[a, $\emptyset$] $\oplus$ [$\sqrt{\text{STRONG}}$, /gassiŋ/]]$_{\text{M}}$
   (c) Input to M-Word Phonology: gassiŋ
   (M-Word) Stress and Footing (gássiŋ)
2. Merger of higher cyclic head causes Spell-Out of D
   (a) Linearization: [/(gássiŋ)/]$_{\text{M}}$⁀[D]$_{\text{M}}$
   (b) No Local Dislocation: condition "final vowel" not met
   (c) Vocabulary Insertion: [/(gássiŋ)/]$_{\text{M}}$⁀[D, /-a/]$_{\text{M}}$
   (d) Output: *(gássiŋ)=a*

The second pass of M-Word phonology triggered by Local Dislocation can account for the asymmetric behavior of stress assignment in Makassarese. Where Local Dislocation applies, the determiner clitic moves into the host's M-Word and is subject to the M-Word phonology with the host. Where Local Dislocaiton does not apply, the determiner clitic is outside the M-Word of the host and is outside the domain of stress.

[5] Or equivalent constraints. I use rules here for ease of exposition, but I wish to remain agnostic as to whether the phonological processes are implemented with rules or constraints.

3.2 Maltese Verbs and Object Clitics

3.2.1 Data

Maltese shows an asymmetry in the application of syncope when object clitics are attached to verbal stems. While all stems show show syncope of the first vowel when the first-person plural subject agreement suffix is added, the first-person plural object clitic only causes syncope in glide-final hosts, not other hosts, as shown in (14):

(14) Maltese first-person plural subject suffix and object clitic (Brame 1974; Odden 1993)

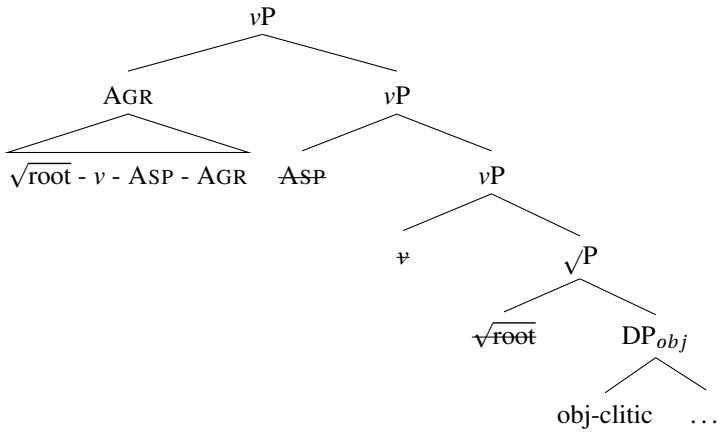
	non-glide-final /ħataf/	glide-final /ʔaraj/	
a. 3.M.sg Subj. Agr. -∅	ħátaf "he snatched"	ʔára "he read"	← no syncope
b. 1.pl Subj. Agr. /-na/	ħtáf-na "we snatched"	ʔráj-na "we read"	← syncope
c. 1.pl Obj. Clitic /-na/	ħatáf-na "he snatched us"	ʔrá:-na "he read us"	← asymmetrical

Although one can account for the difference between the subject agreement and object clitic behaviors with a stratal system (that is, between 14b and 14c; see Kiparsky 2011), there is no stratal difference between the glide-final and non-glide-final hosts in (14c) that can account for the difference in syncope between them when the object clitic is attached.

3.2.2 Analysis

I will assume here that the object clitic originates as a specifier of an object DP, as shown in (15), but any syntactic structure which has the clitic moving in from outside the $\sqrt{\text{root}}$-*v*-ASP-AGR complex will be consistent with the morphophonological analysis.

(15) Syntactic Structure of Maltese verb and object clitic[6]



Under the assumptions of the $\mathbb{C}_1$-LIN theory, the object clitic and the rest of the object DP will undergo spell-out once the cyclic head *v* is merged. However, there is nothing for the object clitic to attach onto until the next cyclic head is attached and spells out the $\sqrt{\text{root}}$-*v*-ASP-AGR complex, allowing the object clitic to move up and linearize onto it. The exact mechanics of this movement will be left unspecified at the moment. The resulting structure will be one in which both the object clitic and the $\sqrt{\text{root}}$-*v*-ASP-AGR complex will have undergone one pass of phonology each, and are syntactically linearly adjacent, but not phonologically combined. The linearized morphosyntactic structure before combining the clitic is shown in (16):

(16) Morphological structure of Maltese verbal complex and object clitic before linearization
[($\sqrt{\text{root}} \oplus v \oplus$ ASP $\oplus$ AGR)]$_M$⌒[obj-clitic]$_M$

[6]Maltese is described as having an aspect rather than a tense system by Borg and Azzopardi-Alexander (1997), so an ASP node is used in this tree. Whether this node is aspect or tense or both does not affect the relevant morphophonology.

I propose that Local Dislocation applies during the Linearization of the object clitic and the $\sqrt{\text{root}}$-*v*-ASP-AGR complex in Maltese, but that it is sensitive to the final segment of the $\sqrt{\text{root}}$-*v*-ASP-AGR complex. That is, Local Dislocation will apply when the final segment of the $\sqrt{\text{root}}$-*v*-ASP-AGR complex is a vowel but not when the final segment is a consonant. This results in a second pass of the M-Word phonology being run for V-final hosts, but not for C-final hosts.

(17) Maltese object clitic Local Dislocation Rule
$[\ (\sqrt{\text{root}} \oplus v \oplus \text{ASP} \oplus \text{AGR})\ ]_M{}^\frown[\ \text{obj-clitic}\ ]_M \rightarrow [\ (\sqrt{\text{root}} \oplus v \oplus \text{ASP} \oplus \text{AGR}) \oplus \text{obj-clitic}\ ]_M$
where the phonological form of $[\ (\sqrt{\text{root}} \oplus v \oplus \text{ASP} \oplus \text{AGR})\ ]_M$ ends in a vowel

Using the proposed architecture and Local Dislocation rule, a simple formulation of syncope (18) and a few other simple rules (19), or equivalent constraints, will predict the correct outcome for syncope for Maltese object clitics.

(18) Syncope (M-Word level): $\breve{\text{V}} \rightarrow \emptyset \ / \ \_\ \text{CV}$
"Delete unstressed non-final vowel in a light syllable"

(19) Other relevant rules in Maltese
a. Stress Assignment and Footing (M-Word and Phrasal): "Build trochees right to left"
b. /j/-deletion (M-Word level): $\text{j} \rightarrow \emptyset \ / \ \_\ ]_M$
"Delete /j/ at the end of an M-Word"
c. Boundary Lengthening (M-Word level): $/\text{V}/ \rightarrow [\text{V:}] \ / \ \_\ ]_M$
"Lengthen a vowel at the end of an M-Word"
d. Final long vowel shortening (Phrasal Level): $\text{V:} \rightarrow \text{V} \ / \ \_\ ]_M$
"Shorten a M-Word final long vowel"

The derivation of *ʔraːna* "he read us" is shown in (20). At the merge of *v*, the root and object clitic are Spelled-Out. After higher cyclic node causes the Spell-Out of the rest of the $\sqrt{\text{root}}$-*v*-ASP-AGR complex, the object clitic moves up to adjoin it. At this point, the $\sqrt{\text{root}}$-*v*-ASP-AGR complex has already undergone one pass of M-Word phonology, resulting in the form /ʔáraː/. However, the Local Dislocation of the clitic into the M-Word of the $\sqrt{\text{root}}$-*v*-ASP-AGR complex causes a second cycle to run, resulting in the syncope of the first vowel.

(20) Derivation of Maltese *ʔraːna* "he read us"

1. Merge of *v* triggers Spell-Out of $\sqrt{\text{P}}$:
   (a) Vocabulary Insertion: [$\sqrt{\text{READ}}$, /ʔaraj/], [obj-clitic[1.pl.], /-na/]
2. Merge of higher cyclic head causes Spell-Out of *v*, ASP, and AGR, movement of nodes up to AGR:
   (a) Linearization: $[\ [\sqrt{\text{READ}}, /\text{ʔaraj}/] \oplus v \oplus \text{ASP[Perf.]} \oplus \text{AGR[3.M.sg]})\ ]_M$
   (b) Vocabulary Insertion:
   $[\ [\sqrt{\text{READ}}, /\text{ʔaraj}/] \oplus [v, \emptyset] \oplus [\text{ASP[Perf.]}, \emptyset] \oplus [\text{AGR[3.M.sg]}, \emptyset]\ ]_M$
   (c) Input to M-Word Phonology: ʔaraj

(M-Word) Stress and Footing	(ʔáraj)
(M-Word) Syncope	—
(M-Word) /j/-deletion	(ʔára)
(M-Word) Boundary Lengthening	(ʔáraː)

3. Movement of object clitic up to $\sqrt{\text{root}}$-*v*-ASP-AGR complex
   (a) Linearization: $[\ \sqrt{\text{root}}\text{-}v\text{-ASP-AGR}, /(\text{ʔáraː})/\ ]_M{}^\frown\ [\ [\text{obj-clitic[1.pl.], /-na/}]\ ]_M$
   (b) Local Dislocation: $[\ \sqrt{\text{root}}\text{-}v\text{-ASP-AGR}, /(\text{ʔáraː})/ \oplus [\text{obj-clitic[1.pl.], /-na/}]\ ]_M$
   (c) Input to M-Word Phonology (second pass): ʔáraː-na

(M-Word) Stress and Footing	ʔa(ráːna)
(M-Word) Syncope	(ʔráːna)
(M-Word) /j/-deletion	—
(M-Word) Boundary Lengthening	(ʔráːnaː)

4. Output, Input to Phrasal Phonology: (ʔráːnaː)
   (Phrase Level) Vː] Shortening ʔráːna

The derivation of *ħatáfna* "he snatched us" is shown in (21). Local Dislocation does not apply in step (21-3b), thus there is no second pass of M-Word phonology. The result is no additional change in the phonology of the $\sqrt{\text{root}}$-*v*-ASP-AGR complex other than the leaning-on of the clitic and Phrasal phonology. This accounts for the lack of syncope in this form.

(21) Derivation of Maltese *ħatáfna* "he snatched us"

1. Merge of *v* triggers Spell-Out of $\sqrt{}$P:
   (a) Vocabulary Insertion at $\sqrt{}$P: [$\sqrt{\text{SNATCH}}$, /ħataf/], [obj-clitic[1.pl.], /-na/]
2. Merge of higher cyclic head causes Spell-Out of *v*, ASP, and AGR, movement of nodes up to AGR:
   (a) Linearization: [[$\sqrt{\text{SNATCH}}$, /ħataf/] ⊕ *v* ⊕ ASP[Perf.] ⊕ AGR[3.M.sg])]$_{\text{M}}$
   (b) Vocabulary Insertion:
   [[$\sqrt{\text{SNATCH}}$, /ħataf/] ⊕ [*v*, ∅] ⊕ [ASP[Perf.], ∅] ⊕ [AGR[3.M.sg], ∅]]$_{\text{M}}$
   (c) Input to M-Word Phonology: ħataf

(M-Word) Stress and Footing	(ħátaf)
(M-Word) Syncope	—
(M-Word) /j/-deletion	—
(M-Word) Boundary Lengthening	—

3. Movement of object clitic up to $\sqrt{\text{root}}$-*v*-ASP-AGR complex
   (a) Linearization: [$\sqrt{\text{root}}$-*v*-ASP-AGR, /(ħátaf)/]$_{\text{M}}$⁀[[obj-clitic[1.pl.], /-na/]]$_{\text{M}}$
   (b) No Local Dislocation: fails "final vowel" condition
4. Output, to Phrasal Phonology: (ħátaf)=na
   (Phrasal) Stress and Footing ħa(táfna)

This architecture also predicts the correct outcome for the forms without object clitics, as shown in (22). In these cases, the subject agreement *-na* starts out in the same M-Word as the root due to the syntactic movement of the $\sqrt{\text{root}}$, *v*, and ASP nodes up to AGR, thus only one pass of M-Word phonology applies.

(22) Derivations for Maltese forms without object clitics

	ħtáfna "We snatched"	*ʔrájna* "We read"
Linearization	[ħataf ⊕ na]$_M$	[ʔaraj ⊕ na]$_M$
Input to M-Word Phonology	ħataf-na	ʔaraj-na
(M-Word) Stress and Footing	ħa(táf-na)	ʔa(ráj-na)
(M-Word) Syncope	(ħtáf-na)	(ʔráj-na)
(M-Word) /j/-deletion	—	—
(M-Word) Boundary lengthening	(ħtáf-naː)	(ʔráj-naː)
Input to Phrase Level Phonology	(ħtáfnaː)	(ʔrájnaː)
(Phrasal) Vː]$_M$-shortening	(ħtáfna)	(ʔrájna)
Output	(ħtáfna)	(ʔrájna)

As predicted by the output of the M-Word phonology with a final long vowel, these forms do show up lengthened in forms with an object clitic, such as "we read you" *ʔrajnɪ̲ːkom* and "we snatched you" *ħtafɪ̲ːkom* (where [ɪː] is a normal outcome of underlying long /aː/).

3.2.3 Evidence for Two Passes of Phonology

In Maltese, the effects of both runs of the M-Word phonology can be seen in (23) with the application of the /j/-deletion and syncope at different passes of the phonology.

(23) Selected Maltese forms comparing /j/-deletion and syncope

	UR		Surface	
a. 3.M.sg Subj. Agr. -∅	/ʔaraj + ∅/	→	ʔára "he read"	← no /j/
b. 1.pl Subj. Agr. /-na/	/ʔaraj + na/	→	ʔráj-na "we read"	← /j/
c. 1.pl Obj. Clitic /-na/	/ʔaraj + ∅ # na/	→	ʔrá:-na "he read us"	← no /j/

The form *ʔára* has a final /j/ which is deleted when the M-Word phonology is run. In the form *ʔrájna*, the /j/ is never M-Word-final so /j/-deletion does not apply. The first vowel of underlying /ʔaraj-na/, however, is subject to syncope, resulting in *ʔrájna*. In the derivation of *ʔrá:na*, however, the /j/ must be M-Word final during a pass of the M-Word phonology in order to be deleted. The initial vowel must also be in the right configuration for syncope. These two environments, however, do not happen at the same time, but rather sequentially, as shown in (24):

(24) Derivation of *ʔrá:na* compared with *ʔára* and *ʔrájna*

	ʔára "he read"	*ʔráj-na* "we read"	*ʔrá:-na* "he read us"
UR + Subj. Agr.	ʔaraj + ∅	ʔaraj + na	ʔaraj + ∅
1. Stress and Footing	(ʔáraj)	ʔa(rájna)	(ʔáraj)
2. Syncope	—	(ʔrájna)	—
3. /j/-deletion	(ʔára)	—	(ʔára)
4. Boundary Lengthening	(ʔára:)	(ʔrájna:)	(ʔára:)
Second pass *of same rules*			# na
Input (+ Obj.Cl.)			(ʔára:)+na
1. Stress and Footing			ʔa(rá:na)
2. Syncope			(ʔrá:na)
3. /j/-deletion			—
4. Boundary Lengthening			(ʔrá:na:)
(Phrase) V:] shortening	(ʔára)	(ʔrájna)	(ʔrá:na)
Output	*ʔára*	*ʔrájna*	*ʔrá:na*

As demonstrated, the second pass of M-Word phonology accounts for the syncope in *ʔrá:na*, but the first pass leaves a trace with the deletion of the underlying /j/.

4 Conclusion

In this paper I presented case studies in Maltese and Makassarese in which asymmetries in phonological form were dependent on both phonological (phonological shape of the host) and morphosyntactic (presence of a particular clitic) information.

I proposed a framework in which the trigger for applying the M-Word block of phonological processes was the Spell-Out of the morphosyntactic M-Word structure. The M-Word level phonology was proposed to be re-triggered when late movement caused by Local Dislocation moved new material into a previously constructed M-Word. The Local Dislocation process was able to be conditioned by the phonology of the M-Words it was manipulating because those M-Words had already been spelled out, following the $\mathbb{C}_1$-LIN theory of cyclic Spell-Out.

Abstractly, the analysis is a phonological cycle running before a morphological movement process which is conditioned by phonological shape and triggers another pass of the phonological cycle. This is a more complex and intricate interaction of phonology and morphology than proposed in other theories of the interface. However, this interaction can neatly account for the data presented here using only simple phonological rules and a basic morphological movement operation.

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