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Paradoxical paradigms! Evidence from Lebanese Arabic phonology

Youssef A. Haddad and Caroline Wiltshire

Examinations of Optimal Paradigms (McCarthy, 2005) suggest that only phonological outputs of inflectional paradigms obey OPTIMAL PARADIGM constraints, whereby each member of a given paradigm strives to resemble the phonological structure of each other member of that paradigm. Words that are derived from “base” words, on the other hand, are claimed to obey BASE-OUTPUT constraints which require all members of the paradigm to conform to the structure of one member selected as a BASE. In this study, we examine Lebanese Arabic paradigms of sound regular, sound geminate, weak hollow, and weak defective verbs. Lebanese Arabic verbal paradigms show that while BASE-OUTPUT constraints do play a role in determining the phonological structure of related words derived from a base, OPTIMAL PARADIGM constraints also participate in such morphology. The outcome is paradoxical paradigms in which members strive to resemble a BASE while at the same time trying to resemble each other phonologically.

Keywords: Optimal Paradigms constraints, base-output constraints, Lebanese Arabic.

Introduction

McCarthy (2005), building on Benua’s (1997) Transderivational Correspondence Theory and on Kenstowicz’s (1996) Uniform Exponence, puts forth a theory of Optimal Paradigms (OP) in which he argues that output-output correspondence is a necessary part of Optimality Theory (Prince & Smolensky, 1993, 2004). More specifically, McCarthy argues that individual members in inflectional paradigms take into account the phonological structure of all paradigm members and that each member strives to conform to the structure of the majority even if this means that the phonological form of some members will end up being opaque and/or violating some input-output constraints. For example, the English word *lightening* is pronounced with a syllabic *n* – and not like *lightning* – in conformity

with the co-members of its paradigm, namely *lighten*, *lightens*, and *lightened* (McCarthy, 2005, p. 170).

While illustrated with examples from inflectional paradigms, the above output-output constraint is claimed not to apply to words derived from a base, which are called “derivational paradigms” (McCarthy, 2005, p. 174). Derivational paradigms seem to work differently in that the relation among the members is asymmetric: All members conform to the structure of one member selected as a base, while the base need not conform to the structure of any other member. To illustrate, in Palestinian Arabic, a high vowel that would appear as unstressed in a non-final syllable normally undergoes syncope. For example, /fihimna/ ‘we understood’, a member of the inflectional paradigm of the verb /fihim/ ‘he understood’, surfaces as [f<i>.'him.na].¹ Surprisingly, a segmentally identical input with a different morphological structure, /fihim-na/ ‘he understood us’, is realized as [fi.'him.na]; that is, without syncope. The latter is a member of the derivational – rather than the inflectional – paradigm of /fihim/ ‘he understood’. Several researchers argue that this is the case because members of such derivational paradigms obey a base-identity constraint that requires all members to resemble a morphologically related base (e.g. Kenstowicz, 1996; Kager, 1999). In the case of [fi.'him.na] ‘he understood us’, no syncope takes place in order for the verb to conform to the structure of the base [f'i.him] ‘he understood’. Kager (1999, p. 216 [15]) calls this constraint Head-Max (B/O):

(1) HEAD-MAX (B/O)

Every segment in the base prosodic head has a correspondent in the output.

Note that [f<i>.'him.na] ‘we understood’, which is also morphologically related to [f'i.him], does not have to obey this constraint because it is a member of the inflectional rather than the derivational paradigm of [f'i.him]. The relation among the members of an inflectional paradigm is symmetrical: There is no base; every member tries to resemble the structure of the majority.

The focus of this paper is on Lebanese Arabic (LA) verbs that take on dative and accusative pronominal clitics.² Accusative and dative clitics are level-two morphemes introduced at the “word level” of lexical phonology (Kiparsky, 2002).³ Thus, these clitics are attached to a word that counts as a base.

1. The angled brackets indicate that the segment is not pronounced in the surface form.

2. Unless otherwise specified, the LA data come from the variety of suburban Beirut of which one of the authors is a native speaker.

3. Subject agreement is also level-two morphology, but it is inserted at the stem level rather than at the word level of lexical phonology.

The paradigms under examination seem to obey the aforementioned base-output constraint HEAD-MAX (B/O) with respect to syncope; that is, all members of the paradigm strive to be structurally similar to a base. However, we witness an unexpected case of majority rule with regard to the assignment of stress. In this case, the base form does not determine the output, and an Optimal Paradigm constraint that we will call OP-IDEN-STRESS is obeyed. As (2) indicates, the constraint requires each member of the paradigm to resemble the majority of the members with respect to stress assignment.

(2) OP-IDEN-STRESS

Each member of a paradigm has stress on the same syllable as each other member of that paradigm.

We will consider four types of verbs: sound regular, sound geminate, weak hollow, and weak defective. Sound verbs are based on triconsonantal roots $C_1C_2C_3$, none of which is a semi-vowel /w/ or /j/. Sound regular (hereafter sound) verbs are based on roots in which C_2 and C_3 are distinct; [kasar] ‘he broke’ is an example, as it is based on the root K-S-R. Sound geminate (hereafter geminate) verbs are based on roots in which C_2 and C_3 are identical; for example, [madd] ‘he stretched’ is based on the root M-D-D.

Weak verbs are based on triconsonantal roots, one consonant of which is a semi-vowel /w/ or /j/. Weak hollow (hereafter hollow) verb roots have a semi-vowel as C_2 , for example N-W-M. The semi-vowel is not realized in the output of pattern I verbs; thus, /nawam/ – or /newem/ as it would probably be pronounced if realized faithfully in LA – surfaces as [ne:m] ‘he slept’. Weak defective (hereafter defective) verb roots have a semi-vowel as C_3 , for example Ĥ-K-J. Again, the semi-vowel is not part of the output of the verbs in question, resulting in [ħike:] or [ħaka:] ‘he spoke/said’. (For a detailed overview of the different types of verbs in Standard Arabic see Ryding, 2008, chapter 22 or Alhawary, 2011, chapter 13).⁴ Since the location of stress will be involved in the analysis, we briefly introduce the generalizations here. Stress falls on the ultimate syllable if superheavy, on the penultimate if heavy, and otherwise on the antepenultimate, thereby landing two or three moras from the right edge of the word. While

4. There are other types of verbs that we do not discuss separately because their behavior is identical to the behavior of one or more of the types we discuss here. These are hamzated, assimilated, and doubly weak verbs. Hamzated verbs are based on roots that contain a glottal stop as one of its consonants. Weak assimilated verbs are based on roots that contain a semi-vowel as C_1 . Neither the glottal stop nor a semi-vowel as C_1 adds an extra dimension to the behavior of the paradigm of verbs under examination. Doubly weak verbs are based on roots that contain two semi-vowels; they can be assimilated defective or hollow defective. Both types may be treated as otherwise defective verbs for the purposes of this paper.

these generalizations could clearly be stated in terms of competing constraints in OT, for ease of presentation we will use a single cover constraint we will call *STRESSLOCATION*.

(3) *STRESSLOCATION*:

Stress falls on the ultimate syllable if superheavy, on the penultimate if heavy, and otherwise on the antepenultimate.

In the following section we will first introduce the derivational paradigms of verbs with dative clitics followed by a presentation of the derivational paradigms of verbs with accusative clitics. These analyses show that these derivational paradigms strive to obey not only the base-output constraint *HEAD-MAX (B/O)*, as expected, but also the OP constraint *OP-IDEN-STRESS*, which is unexpected based on cross-linguistic investigations (e.g., McCarthy, 2005). Following these analyses, we present the analysis of sound verbs plus accusative clitics and attempt to provide a possible explanation to its unusual paradigm structure.

2. Verbs plus dative clitics

We start with the paradigm of geminate 3rd Sg Mas perfective verbs because it presents most clearly the satisfaction of both the OP constraint *OP-IDEN-STRESS* as well as the base-output constraint *HEAD-MAX (B/O)*. We next show that the sound and defective paradigms of perfective 3rd Sg Mas pattern I verbs satisfy *OP-IDEN-STRESS* vacuously, after which we generalize over verbs of different aspects (e.g., imperfective), agreement (e.g., 1st Sg), and patterns (e.g., pattern IX). The final section focuses on hollow verbs. These also satisfy *OP-IDEN-STRESS*; however, they do so indirectly.

Geminate verbs with dative clitics

Table (4) presents the paradigm of the verb ‘to return (sth)’ with dative pronominal clitics. The verb may take two surface forms in different paradigms: the degeminated form [rad] or the geminate [radd]. The former is usually realized in a pre-pausal position or if the verb is followed by CV, where the CV can be the onset of a new word or of a suffix; the latter is usually realized pre-vocally, where the vowel can be in the input or epenthetic.

(4) Geminate verb *radd* 'he returned (sth)' + dative clitics

Input	Optimal Output	'returned sth'	Sub-optimal Output
a. /radd-l-i/	rad.'d-al.li	'~ to me'	*'rad.d-a.li, *'rad.-li
b. /radd-l-na/	rad.'d-al.na	'~ to us'	
c. /radd-l-ak/	rad.'d-al.lak	'~ to you (M)'	*'rad.d-a.lak, *'rad.lak
d. /radd-l-ik/	rad.'d-al.lik	'~ to you (F)'	*'rad.d-a.lik, *'rad.lik
e. /radd-l-kun/	rad.'d-al.kun	'~ to you all'	
f. /radd-l-o/	rad.'d-al.lo	'~ to him'	*'rad.d-a.lo, *'rad.lo
g. /radd-l-a/	rad.'d-al.la	'~ to her'	*'rad.d-a.la, *'rad.la
h. /radd-l-un/	rad.'d-al.lun	'~ to them'	*'rad.d-a.lun, *'rad.lun

The analysis reveals that all the members of the paradigm obey HEAD-MAX (B/O), as they match the base form [radd]. It should be noted, though, that the paradigm also strives, in an overkill fashion, to satisfy the OP constraint OP-IDEN-STRESS.

The relevant members of the paradigm are (4a), (4c), (4d), (4f), (4g), and (4h), in which the dative marker /-l-/ is realized as [-ll-]. To justify the input form of the dative marker as a single /-l/ rather than already being /-ll-/, we illustrate in (5a) below that the dative marker is normally realized faithfully as [-la-], with no consonantal epenthesis, in the case of a sound verb. Note that if the dative marker were underlyingly /-ll-/ instead of /-l-/, the surface form in (5a) would be *[kataballa] instead of [katabla]. In (5b), an epenthetic [a] is used to break the cluster /CCC/, while in (5c) we see that the epenthetic vowel may be [i], as in the imperative form. In both these cases, the /-la/ appears as geminated [-lla].⁵

- (5) a. /katab/ + /-la/ → [katabla] 'he wrote to her'
 b. /radd/ + /-la/ → [raddalla] 'he returned (sth) to her'
 c. /ridd/ + /-la/ → [riddilla] '(you) return (sth) to her'

Second, we should justify that the final consonant of the verb /radd-/ is already a geminate, and is not being doubled, since the doubling of a consonant as a result of level-two morphology is not uncommon in Arabic, both standard and colloquial. For example, observe the LA paradigm of the preposition /min/ 'of/from' with the accusative clitics in the table in (6). The /n/ is doubled before clitics that begin with a vowel in (6a), (6c), (6d), (6f), (6g), and (6h), but no doubling takes place when the clitic begins with a consonant in (6b) and (6e). The reason is that level-two morphemes have a minimal-stem restriction; they cliticize to stems that

5. The epenthetic vowel matches the preceding vowel. In (5b), the epenthetic vowel is [a] because the preceding vowel is [a], while in (5c), the epenthetic vowel is [i] to match the preceding vowel, which is also [i].

are at least bimoraic (Watson, 2002, pp. 205–206). By realizing /n/ as [nn], /min-i/ may be realized as [minni]. This means that it is syllabified as [min.ni], a bimoraic stem + a clitic, instead of [mi.ni], which would be a mono-moraic stem + a clitic. This syllabification reflects the system's use of gemination as a repair strategy to satisfy the minimal-stem restriction, since the final /-n/ of the stem would otherwise become an onset without a mora.

(6) Preposition *min* 'of/from' + pronominal clitic

Input	Optimal Output	'from'	Sub-optimal Output
a. /min-i/	'min-n-i	'~ me'	*'min-i
b. /min-na/	'min-na	'~ us'	
c. /min-ak/	'min-n-ak	'~ you (M)'	*'min-ak
d. /min-ik/	'min-n-ik	'~ you (F)'	*'min-ik
e. /min-kun/	'min-kun	'~ you all'	
f. /min-o/	'min-n-o	'~ him'	*'min-o
g. /min-a/	'min-n-a	'~ her'	*'min-a
h. /min-un/	'min-n-un	'~ them'	*'min-un

It might be argued that the preposition 'of/from' is underlyingly /minn/ and that it undergoes degemination before clitics that begin with a consonant. Evidence that this is not the case comes from cases of juncture with a following word that begins with an (epenthetic) vowel. For example, /min + l-madrase/ 'from the school' is realized as [mi.n il.mad.ra.se] with an epenthetic vowel rather than *[min.nil.mad.ra.se]. Compare this to words with a true final geminate, like /ʔimm/ 'mother'. When used in a juncture position followed by a vowel, /ʔimm/ is realized as [ʔimm]; for example, /ʔimm + l-walad/ 'the mother of the child' surfaces as [ʔim.m il-wa.lad]. In both cases, the vowel is epenthetic to save an otherwise illegal onset/coda.

We maintain that providing a bimoraic stem for a level-two morpheme is not why /radd/ has a doubled final consonant; instead, the geminate is present in the input. Nor is it the motivation for the doubling of the dative marker in the examples in Table 1. As illustrated in (7a), the stem *radd* plus the dative clitic *-la* may not be realized faithfully due to constraints that prohibit complex codas and non-initial complex onsets. These constraints, however, may be satisfied in at least two ways: vowel epenthesis, (7b), and degemination, (7c), both of which are less than optimal. In (7b), vowel epenthesis breaks the consonant cluster, resulting in a three-syllable word. In (7c), degemination reduces the consonant cluster CCC into

CC, with one consonant being syllabified in the coda of the first syllable and the other in the onset of the second syllable.⁶

- (7) a. /radd/ + /-la/ → *[rad.dla] OR *[radd.la]
 b. /radd/ + /-la/ → *['rad.d-a.-la]
 c. /radd/ + /-la/ → *['rad.-la]

Although vowel epenthesis will prove necessary in the optimal form, it is not sufficient; neither (7b) nor (7c) is considered acceptable. Rather, an apparently less than optimal output with both an epenthetic [a] and a doubled [l] surfaces as the grammatical form, [rad.'dal.la]. Two OT tableaux will perhaps make the overkill clearer. The tableaux will employ the following additional constraints:

- (8) a. *COMPLEX – No consonant clusters in onsets/codas.
 b. DEP IO (V) – No vowel insertion. Vowels in the output correspond to vowels in the input.
 c. DEP IO (C) – No consonant insertion. Consonants in the output correspond to consonants in the input.
 d. REALIZEMORPH – No morpheme deletion. All morphemes in the input must have some exponence in the output.

As the tableau in (9) shows, forms with a C-initial suffix behave unremarkably, and are stressed on the penultimate syllable:

(9) Geminate verb *radd* + dative clitic without overkill

Input /radd-l-na/ base prosodic head=[radd]	STRESS LOC	*COM PLEX	HEAD-MAX BO	REALIZE MORPH	DEPIO (V)
a. ☞ [rad.'dal.na]					*!
b. ['radd.lna]		*!			
c. ['rad.lna]		*!	*!		
d. ['rad.da]				*!	

The tableau in (9) illustrates an example with the minimal necessary changes (one Dep-IO(V) violation in the winning candidate (9a)) in order to satisfy higher ranked constraints. Candidates (9b) and (9c) lose because the sequence of consonants cannot be syllabified without violating the constraint *COMPLEX, which forbids having two consonants in onset or coda. Candidate (9d) solves that problem

6. Degemination of the type proposed in (7c) is common in many Arabic dialects (see, for example, Watson, 2002, pp. 210–211). For example, when /ʔimm/ 'mother' takes on a clitic that begins with a consonant, it undergoes degemination: /ʔimm + na/ 'our mother' surfaces as [ʔim<m>-na]. Compare to /ʔimm + ak/ 'your (Mas) mother' that is realized as [ʔimm-ak].

by deleting two consonants, including deleting the dative morpheme altogether, resulting in a REALIZEMORPH violation. With DEP-IO(V) ranking lower than these constraints, candidate (9a) wins.

Tableau (10) shows the same ranking, with the added low ranked DEP-IO(C), when applied to the input /radd-l-ik/. Note that the actual output form, (10a), violates both DEP-IO(V) and DEP-IO(C), although, as shown in (10b), it is possible for a candidate to satisfy the higher ranked constraints while violating only DEP-IO(V).

(10) Geminate verb *radd* + dative clitic with overkill

Input /radd-l-i/ base prosodic head=[radd]	STRESS LOC	*COM PLEX	HEAD- MAX BO	REALIZE MORPH	DE- PIO (V)	DE- PIO (C)
a. ☹ [rad.'dal.li]					*	*!
b. ☺ ['rad.da.li]					*	
c. [rad.'da.li]	*!				*	
d. ['rad.dli]/['radd.li]		*!				
e. ['rad.li]			*!			
f. ['rad.di]				*!		

Candidate (10c) is identical to candidate (10b) except for the location of stress, which in (10c) falls on the light penultimate syllable and violates STRESSLOCATION. Candidates (10d), (10e), and (10f) have the same kinds of violations as seen in the previous tableau in candidates (9b-d), and similarly cannot compete against the top candidates. Thus, the actual output (10a), indicated with a ☹, is harmonically bound, that is, beaten regardless of the constraint ranking, by the more conservative candidate in (10b), indicated with ☺. The question is: Why?

Closer examination of the paradigm in table (4) above shows that the overapplication of consonant insertion in the case of all but two members of the paradigm allows all the members to be realized with stress on the same syllable. That is, the overkill does not satisfy a base-output constraint or a single phonotactic constraint. Rather, it satisfies OP-IDEN-STRESS, whereby each member of the paradigm strives to be similar to every other member of the paradigm, and the outcome is a uniform paradigm in terms of the location of stress. The optimal form has stress on the heavy penultimate syllable [dal], while without the DEP-C violation, the penultimate syllable would be light and the first syllable would get stress. If an OP-IDEN-STRESS constraint is higher ranked than the DEP constraints limiting epenthesis, and if it is satisfied by the real winner and not satisfied by the more conservative candidate, then we have an explanation for the overkill, as shown in the tableau in (11).⁷

7. The violation of STRESSLOCATION in (11) will not be the whole story, as we will elaborate upon later.

(11) Optimal Paradigm effect on geminate verb *radd* + dative clitic (a snapshot)

Input /radd-l-i/ base prosodic head=[radd]	OPIDEN STRESS	STRESS LOC	*COMP	HEAD- MAX BO	REALIZE MORPH	DEPIO (V)	DEPIO (C)
a. ☞ [rad.'dal.li]						*	*
b. ['rad.da.li]	*!					*	
c. [rad.'da.li]		*!				*	
d. ['rad.dli]/['radd.li]	*!		*!				
e. ['rad.li]	*!			*!			
f. ['rad.di]	*!				*!		

Tableau (12) shows a fuller evaluation of the whole paradigm. In the winning set of candidates, (12a), OP-IDEN-STRESS is satisfied, since all members of the paradigm have the same location of stress while also satisfying the constraint STRESS-LOC. However, if only vowel epenthesis without *l*-doubling applies, the paradigm will not be uniform with regard to stress, which makes it less than optimal, as (12b) illustrates with two members stressed on the penultimate syllable and six on the initial syllable. In (12c), stress will fall uniformly on the first syllable throughout the paradigm, but for two members of the paradigm (['rad.dal.na] and ['rad.dal.kun]), this location violates STRESSLOC because the penultimate syllables are heavy yet not stressed. Resolving that problem by deleting the dative suffix fatally runs afoul of the REALIZEMORPH constraint, in (12d).

(12) Optimal Paradigm of geminate verb *radd* + dative clitic (complete)

Input /radd+ l/{i, na, ak, ik, kun, o, a, un} base prosodic head=[radd]	OPIDEN STRESS	STRESS LOC	REALIZE MORPH	HEAD- MAX BO	DEP IO(V)	DEP IO(C)
a. ☞ {rad.'dal.li, rad.'dal.na, rad.'dal.lak, rad.'dal.lik, rad.'dal.kun, rad.'dal.lo, rad.'dal.la, rad.'dal.lun}					**** ****	**** **
b. {'rad.da.li, rad.'dal.na, 'rad.da.lak, 'rad.da.lik, rad.'dal.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}	**!				**** ****	

c.	{'rad.da.li, 'rad.dal.na, 'rad.da.lak, 'rad.da.lik, 'rad.dal.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}		*!*			****	****
d.	{'rad.da.li, 'rad.da.na, 'rad.da.lak, 'rad.da.lik, 'rad.da.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}			*!*		****	****

Any attempt to have stress fall uniformly on the initial syllable results in problems for the two members of the paradigm whose affix begins with a consonant. We mentioned in the introduction that OP is about the pressure for the majority to win. In the case of *radd* 'to return (sth)', the majority does not win. Six members of the paradigm in (4) above experience two violations of Input-Output faithfulness constraints in order to be more like two members: (4b) *rad.'dal.na* 'he returned (sth) to us' and (4e) *rad.'dal.kun* 'he returned (sth) to you all'. While this outcome goes against majority rule, it is justified. The reason is that (4b) and (4e) do not have a way to shift the stress to the first syllable to be more like the more faithful alternatives of the other six members.

To elaborate, consider the underlying form of (4b) as presented in (13), along with the potential outputs in (13a-d). (13a) is not possible because it violates constraints on complex onsets and codas: *[radd.lna]. In (13b) degemination takes place; this is possible if the doubled consonant is followed by a consonant-initial clitic, which is the case here. Degemination does not solve the problem, however, because every possible output would still violate constraints on complex onsets or codas; e.g., *[rad.lna] – *[rad.l.na]. Finally, the deletion of two consonants in (13c) and (13d) should be able to solve the problem; however, the deletion of the doubled consonant in (13c) means doing away with two of the three consonants of the tri-radical root R-D-D, and the deletion of the dative marker in (13d) means that the clitic will now be confused with its accusative counterpart. This is why (13c) and (13d) are less than optimal.

- (13) /radd+ lna/ Actual output: [rad.'dal.na]
- Faithful output: *[radd.lna]
 - Degeminated output: *[rad.lna]
 - Stem consonant deletion: *['ra.l.na]
 - Degemination + Clitic consonant deletion: *['rad.na]

Given that there is nothing that (4b) and (4e) can do to satisfy OP-Iden-Stress by stressing their initial syllables, the other six members in the table in (4) must be the ones to undergo changes in order to match the penultimate stress of the minority two members. Although this results in additional DepC violations for these

six members of the paradigm, the satisfaction of paradigm uniformity in stress is achieved at the least overall cost.

Sound and defective verbs plus dative clitics

Both OP-Iden-Stress and Head-Max (B/O) are satisfied in two other paradigms: sound and defective 3rd Sg Mas perfective verbs plus dative clitics. However, satisfying OP-Iden-Stress in these paradigms happens vacuously as it follows from other high-ranking constraints. We begin with sound verbs plus dative clitics. As the paradigm of the verb ‘to hear’ in (14) illustrates, all the members of the paradigm – except the base, which we do not consider as a member of the paradigm as far as stress is concerned – are assigned stress on the same syllable [miʃ].⁸

(14) Sound verb *simiʃ* ‘he heard’ [C₁iC₂iC₃] + dative clitics

Input	Optimal Output	‘heard’	Sub-optimal Output(s)
a. /simiʃ-li/	si.'miʃ.-li	‘~ from me’	*s<i>.'miʃ.-li
b. /simiʃ-lna/	si.'mi.ʃi.-l.na	‘~ from us’	*s<i>.'mi.ʃi.-l.na, *si.mi.'ʃi.-l.na
c. /simiʃ-lak/	si.'miʃ.-lak	‘~ from you (M)’	*s<i>.'miʃ.-lak
d. /simiʃ-lik/	si.'miʃ.-lik	‘~ from you (F)’	*s<i>.'miʃ.-lik
e. /simiʃ-lkun/	si.'mi.ʃi.-l.kun	‘~ from you all’	*s<i>.'mi.ʃi.-l.kun, *si. mi.'ʃi.-l.kun
f. /simiʃ-lo/	si.'miʃ.-lo	‘~ from him’	*s<i>.'miʃ.-lo
g. /simiʃ-la/	si.'miʃ.-la	‘~ from her’	*s<i>.'miʃ.-la
h. /simiʃ-lun/	si.'miʃ.-lun	‘~ from them’	*s<i>.'miʃ.-lun

In two instances, (14b) *si.'mi.ʃi i-l.na* ‘he heard from us’ and (14e) *si.'mi.ʃi i-l.kun* ‘he heard from you all’, the *ʃ* in [miʃ] is syllabified as the onset of the following syllable, turning [miʃ] into [mi] and, thus, a light syllable. In principle, stress should fall on the heavy syllable [ʃil], contrary to fact. According to Kager (1999, p. 222), the reason is that [i] in [ʃil] is epenthetic, and stress avoids syllables whose nuclei are epenthetic, even if they fall in the right location to be stressed (that is, in a heavy penultimate syllable).

(15) *STRESSEPENV:

Every vowel in the output prosodic head has a correspondent in the input
(named HEAD-DEP(OI) in Kager, 1999, p. 222 [33])

8. ‘He heard from me’ in (14) means ‘he listened to me/he took my opinion into consideration.’

Note, that in the paradigm of geminate verbs, as illustrated by [radd] ‘to return (sth)’ in (4), stress falls on syllables with epenthetic nuclei: the *a* and *i* in [rad.'dal.li] ‘he returned (sth) to me’ and [rid.'dil.li] ‘(you.Mas) return (sth) to me’ respectively are epenthetic. According to Kager (1999, pp. 240–243; see also Kenstowicz & Abdul-Karim, 1980), this is possible only when the preceding syllable is heavy, which is the case in *rad.'dal.li* but not in *si.'mi.s i-l.na*. In other words, to obey the constraint in (15), stress may fall on the preceding syllable, but only if the preceding syllable is not heavy; otherwise, it must remain on the penultimate syllable. Thus, the constraint in (16) prevents stress from falling too far from the right edge of the word; i.e., more than three moras.

(16) *'σΗσΗσ

Do not stress a heavy antepenultimate syllable when the penultimate syllable is also closed/heavy.

The ranking of the stress constraints reflects the priorities: stress falls on a heavy penultimate syllable by STRESSLOCATION, unless that would stress an Epenthetic vowel (*STRESSEPENV), unless avoidance of an epenthetic vowel results in stress on a heavy antepenultimate syllable followed by a heavy penultimate one.

(17) Relative ranking of stress-related constraints:

*'σΗσΗσ >>*STRESSEPENV >> STRESSLOCATION

Thus the forms in the table in (14) follow the above regular pattern of stress in LA, as reflected in the above constraints and their ranking. Furthermore, note that the stressed vowel in the base is realized in every member of the paradigm even when it is unstressed and therefore should have been deleted. In this way, the paradigm satisfies HEAD-MAX (B/O).

The analysis of sound verbs applies not only to stems in which the vocalic melody is [i-i] but also to stems in which the vocalic melody is [a-a], as the table in (18) illustrates. Regarding the base-output constraint, and the non-deletion of [a], it is worth noting that unlike Palestinian Arabic, which allows i-syncope but not a-syncope (see Kenstowicz & Abdul-Karim, 1980), the LA dialect analyzed here allows a-syncope, though it is optional. For example, /dafaʃna/ ‘we pushed’ may surface as [da.'faʃ.na] or [d<a>.'faʃ.na]. Still, the unstressed [a] is preserved in all the members of the derivational paradigm in (18) in order to satisfy HEAD-MAX (B/O).

(18) Sound verb *dafaf* 'he pushed' [C₁aC₂aC₃] + dative clitics

Input	Optimal Output	'pushed (sth)'	Sub-optimal Output(s)
a. / dafaf-li/	da.'faf.-li	'~ for me'	*d<a>.'faf.-li
b. / dafaf-lna/	da.'fa.fi-l.na	'~ for us'	*d<a>.'fa. fi-l.na, *da.fa.'fi-l.na
c. / dafaf-lak/	da.'faf.-lak	'~ for you (M)'	*d<a>.'faf.-lak
d. / dafaf-lik/	da.'faf.-lik	'~ for you (F)'	*d<a>.'faf.-lik
e. / dafaf-lkun/	da.'fa.fi-l.kun	'~ for you all'	*d<a>.'fa. fi-l.kun, *da.fa.'fi-l.kun
f. / dafaf-lo/	da.'faf.-lo	'~ for him'	*d<a>.'faf.-lo
g. / dafaf-la/	da.'faf.-la	'~ for her'	*d<a>.'faf.-la
h. / dafaf-lun/	da.'faf.-lun	'~ for them'	*d<a>.'faf.-lun

OP-IDEN-STRESS is vacuously satisfied in defective verbs as well. These verbs are realized with a final long vowel, although the semi-vowel may surface in verbs with different agreement. For example, the root for the verb 'to speak/say' is H K J . The perfective 3rd Sg Mas pattern I form is [hike:] or [haka:] 'he spoke/said', whereas the 1st Pl counterpart is [hakajna], [hkajna], or [hki:na] 'we spoke/said'. As the paradigm in (19) shows, the syllable preceding the dative clitic is always heavy CV:, sometimes even superheavy CV:C, and thus will always receive stress, satisfying OP-IDEN-STRESS and resulting in paradigm uniformity. By the same token, the stressed vowel in the base has a correspondent in each member of the paradigm although it is stressed in none. Deletion of the [i] would result in suboptimal outputs.

(19) Defective verb *hike*: 'he spoke/said' + dative clitics

Input	Optimal Output	'spoke/said/related'
a. /hike:-li/	hi.'ke:.-li	'~ to me'
b. /hike:-lna/	hi.'ke:.-l.na	'~ to us'
c. /hike:-lak/	hi.'ke:.-lak	'~ to you (M)'
d. /hike:-lik/	hi.'ke:.-lik	'~ to you (F)'
e. /hike:-lkun/	hi.'ke:.-l.kun	'~ to you all'
f. /hike:-lo/	hi.'ke:.-lo	'~ to him'
g. /hike:-la/	hi.'ke:.-la	'~ to her'
h. /hike:-lun/	hi.'ke:.-lun	'~ to them'

In the following section, we generalize beyond perfective 3rd Sg Mas pattern I verbs.

Other verbs plus dative clitic

In this section, we show that our analysis applies beyond the narrow sliver of verbal morphology presented in the previous sections. Our analysis makes an important prediction: OP constraints are satisfied in an overkill fashion when the dative clitics are added to a paradigm in which the base ends with a superheavy syllable, such as [radd] ‘he returned (sth)’. These same constraints are satisfied vacuously elsewhere. This prediction is borne out.

Observe the paradigms of pattern I perfective and imperfective verbs plus subject agreement in the tables in (20) through (22).⁹

(20) Perfective and imperfective geminate verb plus subject agreement

	Perfective		Imperfective
a. He	/radd/	['radd]	['jriidd]
b. She	/raddit/	['rad.dit]	['tridd]
c. They	/raddu:/	['rad.du]	['jrid.du]
d. You (M)	/raddt/	[rad.'de:t] [rad.'dajt]	['tridd]
e. You (F)	/raddti:/	[rad.'daj.ti]	['trid.di]
f. You (PL)	/raddtu:/	[rad.'daj.tu]	['trid.du]
g. I	/raddt/	[rad.'de:t] [rad.'dajt]	['ridd]
h. We	/raddna:/	[rad.'daj.na]	['nridd]

(21) Perfective and imperfective sound verb plus subject agreement

	Perfective		Imperfective
a. He	/simiʃ/	['si.miʃ]	['jis.maʃ]
b. She	/simiʃit/	['sim.ʃit]	['tis.maʃ]
c. They	/simiʃu:/	['sim.ʃu]	['jis.ma.ʃu]
d. You (M)	/simiʃt/	['smiʃt]	['tis.maʃ]
e. You (F)	/simiʃti:/	['smiʃ.ti]	['tis.ma.ʃi]
f. You (PL)	/simiʃtu:/	['smiʃ.tu]	['tis.ma.ʃu]
g. I	/simiʃt/	['smiʃt]	['ʔis.maʃ]
h. We	/simiʃna:/	['smiʃ.na]	['nis.maʃ]

9. Members (20d) through (20h) in the perfective column are reanalyzed in dialects to behave like pattern II of defective verbs, rather than pattern I of geminate verbs as expected. This behavior is typical of geminate verbs in dialects (Watson, 2002, pp. 181) and explains the lack of stress uniformity detected here. The alternatives in (20d) and (20g) are available in the Lebanese dialect analyzed here as a result of optional monophthongization, whereby [aj] becomes [e:].

(22) Perfective and imperfective defective verb plus subject agreement

	Perfective		Imperfective
a. He	/hikij/	['hi.ke]	['jih.ke]
b. She	/hikijit/	['hik.jit] ['hi.kit]	['tiħ.ke]
c. They	/hikiju:/	['hik.ju] ['hi.ku]	['jih.ku]
d. You (M)	/hikijt/	['ħki:t]	['tiħ.ke]
e. You (F)	/hikijti:/	['ħki:.ti]	['tiħ.ke]
f. You (PL)	/hikijtu:/	['ħki:.tu]	['tiħ.ku]
g. I	/hikijt/	['ħki:t]	['ziħ.ke]
h. We	/hikijna:/	['ħki:.na]	['niħ.ke]

All the paradigm members in bold in (20) through (22) end with a superheavy syllable: CVCC or CV:C. These behave in the same way as [radd] 'to return' in (4) when they take on dative clitics. In the perfective paradigms in (20), (21), and (22), the bold members include (d) and (g) of each paradigm – that is, the members that display 2nd Sg Mas agreement and 1st Sg agreement. The two are homophonous. The [radd] paradigm has member (20a) as an additional case. To illustrate, verb [ħki:t] 'I spoke' in (22g) ends with a superheavy syllable. The paradigm of verb [ħki:t] plus dative clitics in (23) is similar to the paradigm of verb [radd] 'he returned sth' in (4) in that it also involves doubling of the dative marker in order for stress to be uniform among all members of the paradigm.

(23) Defective verb *ħki:t* 'I spoke' + dative clitics

Optimal Output	'I spoke'
a. ħki:.'t-il.li †	'~ for me'
b. ħki:.'t-il.na	'~ to us'
c. ħki:.'t-il.lak	'~ to you (M)'
d. ħki:.'t-il.lik	'~ to you (F)'
e. ħki:.'t-il.kun	'~ to you all'
f. ħki:.'t-il.lo	'~ to him'
g. ħki:.'t-il.la	'~ to her'
h. ħki:.'t-il.lun	'~ to them'

† This is an instance of an ethical dative.

Compare the paradigm in (23) with the paradigm of verb [ħikit] 'she spoke' plus dative clitics in (24). The verb [ħikit] does not end with a superheavy syllable. The paradigm receives uniform stress without resorting to the doubling of the dative marker.

(24) Defective verb *hiki.t* ‘she spoke’ + dative clitics

Optimal Output	‘she spoke’
a. hi.'kit.li	‘~ to me’
b. hi.'ki.t -il.na	‘~ to us’
c. hi.'kit.lak	‘~ to you (M)’
d. hi.'kit.lik	‘~ to you (F)’
e. hi.'ki.til.kun	‘~ to you all’
f. hi.'kit.lo	‘~ to him’
g. hi.'kit.la	‘~ for her’
h. hi.'kit.lun	‘~ to them’

The analysis is not limited to pattern I verbs; consider pattern IX for example. This is the only Arabic pattern whose template has a double consonant at the right edge (i.e., C1C2aC3C3). This pattern is used for colors and bodily defects. For instance, [ʔazraʔ] ‘blue’ is based on the root Z-R-ʔ. The perfective, pattern IX, 3rd Sg Mas verb meaning ‘he turned blue’ is [zraʔʔ]. When combined with ethical dative clitics, it behaves like the paradigm of [radd], as (25) illustrates.

(25) Pattern IX verb *zraʔʔ* ‘he turned blue’ + dative clitics

Optimal Output	‘he turned blue’
a. zraʔ.'ʔ-al.li	‘~ for me’
b. zraʔ.'ʔ-al.na	‘~ for us’
c. zraʔ.'ʔ-al.lak	‘~ for you (M)’
d. zraʔ.'ʔ-al.lik	‘~ for you (F)’
e. zraʔ.'ʔ-al.kun	‘~ for you all’
f. zraʔ.'ʔ-al.lo	‘~ for him’
g. zraʔ.'ʔ-al.la	‘~ for her’
h. zraʔ.'ʔ-al.lun	‘~ for them’

Now we turn to the paradigm of hollow verbs plus dative clitics. Again, we focus on 3rd Sg Mas perfective verbs.

Hollow verbs with dative clitics

Hollow verbs, that is, verbs based on roots with a semi-vowel as C2, satisfy the constraint OP-IDEN-STRESS indirectly by satisfying other constraints. As the paradigm in (26) shows, all the members of the paradigm receive stress on the initial syllable. This is expected in all but two members: (26b) *zabilna* ‘he brought (sth) to us’ and (26e) *zabilkun* ‘he brought (sth) to you all’. These are realized as [ʔa.b-il.na]

and [ʔa.b-il.kun], with stress on the antepenultimate light syllable, rather than as *ʔa.b-il.na and *ʔa.ʔb-il.kun with stress on the penultimate heavy syllables. This unexpected assignment of stress, however, follows from another constraint; as we mentioned in relation to the paradigms in (14) and (18), stress avoids syllables whose nuclei are epenthetic if these syllables are preceded by a light syllable CV, according to Kager (1999, pp. 240–243; see also Kenstowicz & Abdul-Karim, 1980). The limitation that stress on epenthetic vowels is possible only when the preceding syllable is heavy provides cause to rule out the unacceptable forms *ʔa.ʔb-il.na and *ʔa.ʔb-il.kun, as the [i] in both forms is epenthetic.

(26) Hollow verb *ʔe:b* ‘he brought’ + dative clitics

Input	Optimal Output	‘brought’	Sub-optimal Output(s)
a. /ʔe:b-li/	ʔab.li	‘~ to me’	
b. /ʔe:b-lna/	ʔa.bil.na	‘~ to us’	*ʔa.ʔbil.na, *ʔe.ʔbil.na
c. /ʔe:b-lak/	ʔab.lak	‘~ to you (M)’	
d. /ʔe:b-lik/	ʔab.lik	‘~ to you (F)’	
e. /ʔe:b-lkun/	ʔa.bil.kun	‘~ to you all’	*ʔa.ʔbil.kun, *ʔe.ʔbil.kun
f. /ʔe:b-lo/	ʔab.lo	‘~ to him’	
g. /ʔe:b-la/	ʔab.la	‘~ to her’	
h. /ʔe:b-lun/	ʔab.lun	‘~ to them’	

However, note that the paradigm in (26) does not completely conform to the structure of the base. Whereas the base is of the form CV:C, the members of the paradigm surface as CVC. This phenomenon is called Closed Syllable Shortening (Watson, 2002, pp. 66–70) and is attested in several Arabic dialects, such as Cairene Arabic, usually due to a constraint on superheavy syllables in non-final positions. LA, however, allows superheavy syllables of the type CV:C word internally; for example, [hi.ke:l.kun] ‘he said to you all’ from Table 5 and [be:b.kun] ‘your (Pl) door’. Thus, Closed Syllable Shortening in the paradigm in (26) is unexpected in terms of phonotactic constraints in LA. However, OPidenStress may offer an answer. A form such as /ʔe:b-lkun/, if realized without shortening, would be forced to have stress on the epenthetic vowel as the initial syllable is heavy. The result [ʔe:ʔbilkun] now does not match the other members of the paradigm in terms of stress location; the optimal output with shortening allows for stress on the first syllable in [ʔabilkun], parallel to the location in the outputs of forms such as /ʔe:b -li/ or /ʔe:b -lik/ in the same paradigm. However, these forms also do not surface with a long vowel, though that is phonotactically acceptable; they shorten

in order to match their co-members in the paradigm, such as [ʔabɪlkun], which resorted to shortening in order to match them in stress location. Thus, the shortening violates the constraint in (27) while satisfying the OP constraint in (28):

(27) MaxIO (μ V):

Vocalic moras present in the input are present in the output (no vowel shortening).¹⁰

(28) OPIDENQUANT:

Each member of a paradigm has the same weight (initial) syllable as each other member of that paradigm.

As the tableau in (29) illustrates, the epenthetic vowel is needed for the resolution of a phonotactically unacceptable consonant cluster in the two forms with a consonant initial affix, leading to a potential violation of OPIdenStress as in (29c). Here the usual stress constraints place stress on the initial syllable in six cases, and on the penultimate in two cases, resulting in two OPIdenStress violation marks. The shortening that resolves the stress issues leads to potential OPIdenQuant violations in (29b); two marks are assessed for the failure of the short vowel in two forms to match the long vowels in the other six forms. Placing stress uniformly on the initial syllable without shortening would violate * $\sigma_H\sigma_H\sigma$ in two forms in (29d). Shortening all vowels, as in the winner (29a), allows for initial syllable stress, with all paradigm members matching in quantity as well.

All eight forms of the paradigm are compromised in some (non-phonotactically-driven) way in order to look similar to other members of the paradigm.

(29) Optimal Paradigm of hollow verb *ʔe:b* + dative clitic

Input /ʔe:b+ l/+ {i, na, ak, ik, kun, o, a, un} base prosodic head=[ʔe:b]	OPIDEN QUANT	OPIDEN STRESS	* $\sigma_H\sigma_H\sigma$	*STRESS EPEN V	STRESS LOC	HEAD MAXBO	DEPIO (V)	MAX (μ)
a. {ʔab.li, 'ʔa.bil.na, 'ʔab.lak, 'ʔab.lik, 'ʔa.bil.kun, 'ʔab.lo, 'ʔab.la, 'ʔab.lun}					**	*** *** **	**	*** *** **
b. {ʔe:b.li, 'ʔa.bil.na, 'ʔe:b.lak, 'ʔe:b.lik, 'ʔa.bil.kun, 'ʔe:b.lo, 'ʔe:b.la, 'ʔe:b.lun}	*!*				**	**	**	**

10. We specify vocalic mora here, to keep vowel shortening distinct from consonant degemination. While it is unclear whether the distinction matters in LA, the two are distinct in other dialects, as a reviewer pointed out.

c.	{'ze:b.li, 'ze:.'bil.na, 'ze:b.lak, 'ze:b.lik, 'ze:.'bil.kun, 'ze:b.lo, 'ze:b.la, 'ze:b.lun}	**!	*!*	**		
d.	{'ze:b.li, 'ze:.'bil.na, 'ze:b.lak, 'ze:b.lik, 'ze:.'bil.kun, 'ze:b.lo, 'ze:b.la, 'ze:b.lun}		*!*			

Before we turn to verbs with accusative clitics, and now that we have introduced new stress constraints, it is time to revisit the Tableau of Geminate Verbs with Dative Clitics in (12), with the verb [radd] 'to return sth' as an example. While the tableau was complete in terms of paradigms, the fully complete tableau including full paradigms and all constraints appears below.

(30) Optimal Paradigm of geminate verb *radd* + dative clitic (complete constraints)

Input /radd+ l/ + {i, na, ak, ik, kun, o, a, un} base prosodic head=[radd]	REALIZE MORPH	OPIDEN STRESS	*'σ _H σ _H σ	*STRESS EPEN V	STRESS LOC	HEAD MAXBO	DEPIO (V)	DEPIO (C)
a. ☞ {'rad.'dal.li, rad.'dal.na, rad.'dal.lak, rad.'dal.lik, rad.'dal.kun, rad.'dal.lo, rad.'dal.la, rad.'dal.lun}				*** *** **			*** *** **	*** ***
b. {'rad.da.li, rad.'dal.na, 'rad.da.lak, 'rad.da.lik, rad.'dal.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}		**!		**			*** *** **	
c. {'rad.da.li, 'rad.dal.na, 'rad.da.lak, 'rad.da.lik, 'rad.dal.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}			*!*		**		*** *** **	
d. {'rad.da.li, 'rad.da.na, 'rad.da.lak, 'rad.da.lik, 'rad.da.kun, 'rad.da.lo, 'rad.da.la, 'rad.da.lun}	*!*							

The paradigm in (30a) wins despite violating a constraint against stressing epenthetic vowels. This, however, is possible due to a constraint against stressing a heavy antepenultimate syllable when the penultimate syllable is also closed or heavy. Otherwise, the paradigm in (30c) would win. However, ['rad.dal.na] and ['rad.dal.kun], with initial stress, violate the high ranking constraint *'σ_Hσ_Hσ, resulting in a preference for (30a).

3. Verbs plus accusative clitics

The paradigms discussed in the previous section all involve dative clitics as level-two morphemes. Another type of level-two morpheme that verbs may take is accusative clitics. Three of four paradigms discussed in the previous section satisfy Head-Max (B/O) when the dative clitics are replaced with their accusative counterparts. Three of the four paradigms satisfy OP-Iden-Stress without much ado. These are geminate verbs (31), defective verbs (32), and hollow verbs (33). In all three paradigms, all members receive stress on the same syllable, and it is always a heavy syllable.¹¹

(31) Geminate verb *radd* 'he returned' + accusative clitic

Input	Optimal Output	'returned'
a. /radd-ni/	'rad.-ni	'~ me'
b. /radd-na/	'rad.-na	'~ us'
c. /radd-ak/	'rad.d-ak	'~ you (Mas)'
d. /radd-ik/	'rad.d-ik	'~ you (Fem)'
e. /radd-kun/	'rad.-kun	'~ you all'
f. /radd-o/	'rad.d-o	'~ him'
g. /radd-a/	'rad.d-a	'~ her'
h. /radd-un/	'rad.d-un	'~ them'

(32) Defective verb *hike*: 'he talked' + accusative clitics

Input	Optimal Output	'talked to'
a. /hi'ke:-ni/	hi.'ke:.-ni	'~ me'
b. /hi'ke:-na/	hi.'ke:.- na	'~ us'
c. /hi'ke:-k/	hi.'ke:-k	'~ you (Mas)'
d. /hi'ke:-ki/	hi.'ke:.-ki	'~ you (Fem)'
e. /hi'ke:-kun/	hi.'ke:.-kun	'~ you all'
f. /hi'ke:-o/	hi.'ke:(-h)	'~ him'
g. /hi'ke:-a/	hi.'ke:.-ha	'~ her'
h. /hi'ke:-un/	hi.'ke:.-hun	'~ them'

11. The 2nd Sg Fem and Mas accusative clitics have two allomorphs: [-ik] and [-ak] with verbs that end with a consonant – e.g., (31) and (33) – and [-ki] and [-k] with verbs that end with a vowel – e.g., (32).

(33) Hollow verb *ʒe:b* ‘he brought’ + accusative clitics

Input	Optimal Output	‘brought’
a. /ʒe:b-ni/	'ʒe:b-ni	‘~ me’
b. /ʒe:b-na/	'ʒe:b.- na	‘~ us’
c. /ʒe:b-ak/	'ʒe:b-ak	‘~ you (Mas)’
d. /ʒe:b-ik/	'ʒe:b-ik	‘~ you (Fem)’
e. /ʒe:b-kun/	'ʒe:b.-kun	‘~ you all’
f. /ʒe:b-o/	'ʒe:b.-o	‘~ him’
g. /ʒe:b-a/	'ʒe:b-a	‘~ her’
h. /ʒe:b-un/	'ʒe:b-un	‘~ them’

Note that some members of the geminate paradigm in (31) undergo degemination; for example, (31e) [radkun] ‘he returned you all’ instead of *[raddkun]. As the tableau in (34) shows, this violates the Base-output constraint HeadMax (B/O) in order to satisfy higher ranking constraints. The paradigm in (34c) shows that if the verb remains geminate, the paradigm would be unevenly split between two stress patterns.

(34) Optimal Paradigm of geminate verb *radd* + accusative clitic

Input /radd/ + {ni, na, ak, ik, kun, o, a, un} base prosodic head=[radd]	*COMP	OPIDEN STRESS	HEAD- MAX BO	DEP (V)	MAX (μ _C)
a. { 'rad.ni, 'rad.na, 'rad.dak, 'rad.dik, 'rad.kun, 'rad.do, 'rad.da, 'rad.dun }			***		***
b. { 'radd.ni, 'radd.na, 'rad.dak, 'rad.dik, 'radd.kun, 'rad.do, 'rad.da, 'rad.dun }	*!***			**	
c. { rad.'da.ni, rad.'da.na, 'rad.dak, 'rad.dik, rad.'da.kun, 'rad.do, 'rad.da, 'rad.dun }		***!		***	

Note that the first syllable in the hollow paradigm in (33) does not undergo Closed Syllable Shortening even when the clitic begins with a consonant. In this sense, this paradigm contrasts with the minimally different paradigm of hollow verbs *plus* dative clitics in (26). In the case of (33), there is no phonotactic/syllable motivation for the epenthetic vowel to be added, so there is no issue of stress location, as in (26). The lack of an epenthetic vowel in the forms in (33) means that OP-IdenStress can be satisfied without alteration in any of the forms.

This leaves us with one paradigm: sound verbs. As (35) and (36) show, sound verbs ‘to hear’ and ‘to push’ satisfy HEAD-MAX (B/O). However, stress assignment is not uniform across all the members of the paradigm, and thus the constraint OP-IDEN-STRESS seems to be violated.

(35) Sound verb *simiʃ* 'he heard' [C₁iC₂iC₃] + accusative clitics

Input	Optimal Output	'heard'	Sub-optimal Output
a. /simiʃ-ni/	si.'miʃ.-ni	'~ me'	
b. /simiʃ-na/	si.'miʃ.-na	'~ us'	*s<i>.'miʃ.-na
c. /simiʃ-ak/	'sim<i>.ʃ-ak	'~ you (Mas)'	
d. /simiʃ-ik/	'sim<i>.ʃ-ik	'~ you (Fem)'	
e. /simiʃ-kun/	si.'miʃ.-kun	'~ you all'	*s<i>.'miʃ.-kun
f. /simiʃ-o/	'sim<i>.ʃ-o	'~ him'	
g. /simiʃ-a/	si.'mi.ʃ-a, 'sim.ʃ-a	'~ her'	
h. /simiʃ-un/	si.'mi.ʃ-un, 'sim.ʃ-un	'~ them'	

(36) Sound verb *dafaʃ* 'he pushed' [C₁aC₂aC₃] + accusative clitics

Input	Optimal Output	'pushed'	Sub-optimal Output
a. /dafaʃ-ni/	da.'faʃ.-ni	'~ me'	
b. /dafaʃ-na/	da.'faʃ.-na	'~ us'	*d<a>.'faʃ.-na
c. /dafaʃ-ak/	'da.fa.ʃ-ak	'~ you (Mas)'	
d. /dafaʃ-ik/	'da.fa.ʃ-ik	'~ you (Fem)'	
e. /dafaʃ-kun/	da.'faʃ.-kun	'~ you all'	*d<a>.'faʃ.-kun
f. /dafaʃ-o/	'da.fa.ʃ-o	'~ him'	
g. /dafaʃ-a/	da.'fa.ʃ-a, 'da.fa.ʃ-a	'~ her'	
h. /dafaʃ-un/	da.'fa.ʃ-un, 'da.fa.ʃ-un	'~ them'	

There is no winner stress pattern in these paradigms, and in two forms, there are two options for the location of output stress. The two verbs with the accusative clitics for 'her' and 'them' [(35g) *simiʃa* 'he heard her'/(36g) *dafaʃa* 'he pushed her' and (35h) *simiʃun* 'he heard them'/(36h) *dafaʃun* 'he pushed them'] may be pronounced with stressed assigned either to the first syllable – such as (35c) *simiʃak* 'he heard you (Mas)' and (36c) *dafaʃak* 'he pushed you (Mas)' – or with stress assigned to the second syllable – such as (35a) *simiʃni* 'he heard me' and (36a) *dafaʃni* 'he pushed me'. This may be the case because the accusative clitics for 'her' and 'them' have two allomorphs each: [-a] and [-ha] for 'her' and [-un] and [-hun] for 'them'. Note that [-ha] and [-hun] surface when the accusative pronominals cliticize to defective verbs that end with a vowel; e.g., (32g) [hike:-ha] 'he talked to her' and (32h) [hike:-hun] 'he talked to them' above. Apparently, even when the [h] is not realized in verbs like *simiʃa* 'he heard her', *simiʃun* 'he heard them', speakers optionally treat the verbs in terms of stress as if the [h] is there; thus *simiʃ(h)a* 'he heard her', *simiʃ(h)un* 'he heard them'. This makes the penultimate syllable optionally heavy and accordingly it receives stress.

As a result of the aforementioned alternation/free variation in stress assignment, the paradigms consist of two equal sets of stress patterns. Five members are assigned stress on the left-most syllables (c, d, f, g, h), and five members are assigned stress on the second left-most syllables (a, b, e, g, h). Perhaps in terms of Optimal Paradigms, this means that each member of the paradigm induces an equal number of violations of OP-Stress when compared to the other members. If OP-IDEN-STRESS stops being a decisive factor in stress assignment, as shown in the tableau in (37) by the use of ? for candidate (37a), the pressures for antepenultimate vs. penultimate stress are evenly matched while other constraints weigh in favor of maintaining the split paradigm.

(37) Sound verb *dafaf* 'he pushed' [C₁aC₂aC₃] + acc the full paradigm

Input /dafaf/ + {ni, na, ak, ik, kun, o, a, un} Base prosodic head=[dafaf]	STRESS LOC	OPIDEN STRESS	HEAD- MAX BO	DEPIO (V)	MAX (μ)
a. ☞ {da.'faf.ni, da.'faf.na, 'da.fa.fak, 'da.fa.fik, da.'faf.kun, 'da.fa.fo, 'da.fa.fa~da.'fa.fa, 'da.fa.fun ~ da.'fa.fun }		?????			
b. { da.'faf.ni, da.'faf.na, d.'fa.fak, d.'fa.fik, da.'faf.kun, d.'fa.fo, d.'fa.fa, d.'fa.fun }			**** *		**** *
c. { 'daf.fa.ni, 'daf.fa.na, 'da.fa.fak, 'da.fa.fik, 'daf.fa.kun, 'da.fa.fo, 'da.fa.fa, 'da.fa.fun }			***	***	***

Candidate (37b) attempts to satisfy OPIDENSTRESS by deleting vowels, resulting in uniform stress on the penultimate syllable, while candidate (37c) includes inserted vowels to result in uniform stress on the initial syllable. Doing neither, candidate (37a) has stress in two locations in the paradigm, but each location has an equal number of members.

Note that the tableau in (37) raises two counterfactuals possibilities:

- (i) If only *da.'fa.fa*, *da.'fa.fun* were available, then the paradigm could tip towards penultimate stress, violating HEADMAX-BO and MAX(μ) to accomplish it in the forms with antepenultimate stress.
- (ii) If only *'da.fa.fa*, *'da.fa.fun* were available, then the paradigm could tip towards antepenultimate stress, violating HEADMAX-BO, MAX(μ), and DEPIO (V) in the forms with penultimate stress.

However, leaving both options available results in a paradigm balanced between penultimate and antepenultimate stress; one solution is to propose that in such cases, OPIDEN constraints are neutralized. However, we leave this case for future research.

4. Conclusion

In this paper, we showed that whereas base-output constraints play a role in determining the phonological structure of the members of derivational paradigms, Optimal Paradigm constraints that are normally considered only operative in inflectional paradigms may also play a role in derivational morphology, where derivational means ‘derived from a base’. We used evidence from LA verbs. We looked at four different types of verbs (sound, geminate, hollow, and defective) and two types of clitics (dative and accusative), giving rise to eight paradigms.

All paradigms satisfy an OP constraint that we called OP-IDEN-STRESS. The constraint requires all the members of the paradigm to be stressed on the same syllable. Seven of the eight paradigms we discussed clearly satisfy this OP constraint, many vacuously. That is, no Input-Output constraint or any other constraint is violated *solely* to produce a paradigm that satisfies OP-IDEN-STRESS. Three cases stand out, however. These are:

- i. Paradigms of verbs with dative clitics in which the base ends with a super-heavy syllable (e.g., [radd]): In this case, Input-Output faithful constraints are violated in an overkill (non-phonotactically motivated) fashion.
- ii. Paradigms of hollow verbs with dative clitics: In this case, HEADMAXBO and MAX_μV are violated extensively so that the shortened base vowel allows uniform stress in the paradigm as well as uniform syllable size throughout the paradigm.
- iii. Paradigms of sound verbs with accusative clitics. We tentatively suggest that this final case appears to be possible only because each member of the paradigm violates OP-IDEN-STRESS an equal number of times, leaving the decision to other constraints such as HEADMAX BO and DEPIO (V).

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