PHARYNGEALIZATION EFFECTS IN MALTESE ARABIC

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1. **Introduction**

As is well known, the phonemic inventory of Classical Arabic and nearly all of the modern dialects includes a set of consonants conventionally referred to as the “emphatics.” The emphatics are a series of consonants (usually \([t, d, s, z/\delta]\)) that are subjectively characterized as sounding more dark and heavy than the corresponding “plain” ones. Finding a way to characterize these phonemes, both phonetically in terms of perceptual and articulatory correlates, and phonologically in terms of defining features, has been a topic of great interest for phonologists. Several recent discussions specifically treat the nature and behavior of the emphatics in various dialects of Arabic (Davis 1995, McCarthy 1997, Watson 1999). A major goal of these and other studies has been how to distinctively characterize these phonemes in terms of feature geometry, and in what way they relate to the Arabic gutturals (uvulars and pharyngeals). I document here several phonological processes involving these segments, including dissimilation as well as both leftward and rightward assimilation. I then argue that while previous feature-geometric representations can capture the behavior of the emphatics in these processes, more recent proposals in which the relevant node and features involve the tongue root give an equally plausible account.

In 2 I describe the behavior of the historical emphatics in Maltese Arabic, a dialect which no longer displays them on the surface,\(^1\) but in which their effects may still be observed by the phonologization of the characteristic backing and lowering effect of emphatics on neighboring vowels.\(^2\) I then account for apparent irregularities in the presence of these effects by positing a guttural dissimilation process similar to that previously documented for Palestinian Arabic (Davis 1995). In 3 I turn my attention to the issue of properly characterizing these classes of segments. Because the Maltese process involves three interacting classes of consonants, rather than the two classes active in Palestinian, it has important ramifications for the feature geometric representation chosen for these consonants and the lower vocal tract as a whole. I evaluate recent competing theories of representation in this light (Davis 1995, Shahin 1997, Zawaydeh 1999, Halle, Vaux & Wolfe 2000). I briefly note the typological status of the behavior of the emphatics in Maltese, and conclude in 4.

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\(^1\) I assume here that historical change has resulted in underlying representations in which vowels contrast rather than emphatic/non-emphatic consonants, and that therefore the processes I describe occurred at a stage of Maltese predating the early 20\(^{th}\) century source material. However, a case could be made that these processes are operative in the synchronic grammar. In that case, Maltese presents an interesting example of complete neutralization, in addition to the behavior of the abstract pharyngeal segment ayn, as described by Brame (1972). Exploring this distinction is beyond the scope of this paper, and does not affect the claims made here.

\(^2\) For an exhaustive survey of the information available on the extent of emphasis spread in over twenty other Arabic dialects, see Cockerill 2000.
2. Maltese Data

In this section I describe the effects the historical emphatics have had in Maltese. I first consider what little evidence is available on non-standard Maltese, principally that of Gozo, in 2.1. I then turn my attention in 2.2 to information available elsewhere on Standard Maltese, where much the same phenomena seem to obtain. New insights on Maltese derived from dictionary data are presented in 2.3. Finally, a guttural dissimilation process that results in apparent exceptions to the generalizations formulated up the that point is discussed in 2.4.

At first glance Maltese may seem an unlikely choice to examine with respect to emphasis, since it is well-known that in this dialect the emphatics long ago lost their secondary articulation (Borg 1997b). However, a few scholars have observed that the historical emphatics are detectable through their effects on the development of the vowel inventory of Maltese (Cowan 1966, Borg 1977, Aquilina and Isserlin 1981). This is a classic case of coarticulation as source of historical change, in that there was “a higher priority on maintaining an acoustic-auditory norm for speech elements rather than an articulatory norm” (Ohala 1993:167). That is, coarticulatory effects of the emphatic consonants on neighboring vowels led to considerable and easily-perceptible acoustic differences in these vowels. These differences in vowel quality were eventually interpreted as phonemic, leading to a phonemic contrast in the vowel inventory and the loss of it in the consonant inventory. Throughout this development, however, the nature of the acoustic signal remained constant, with the locus of the primary cue for both contrasts (consonantal/emphatic or vocalic) remaining in the vowel quality.

In addition, Maltese is written in a Romanized orthography that includes the representation of vowels. This orthography is based upon the pronunciation of speakers in the Maltese capital, Valletta, at around the beginning of the 20th century. Because the orthographic vowel inventory includes the regular five-vowel complement, Maltese thus affords an insight into the behavior of the emphatics at an earlier stage of the language – a perspective that is lacking for other dialects of Arabic.

2.1 Pharyngealization in non-standard Maltese

For the sake of completeness I shall first discuss the literature available on non-standard dialects of Maltese. Two sources deal with the speech of rural Gozo, one of the islands in the Maltese archipelago. The first set of information consists of incidental remarks in a dialect survey of the island. Aquilina and Isserlin observe that effects of previous emphatics can be seen in rural Maltese in differences in the realization of adjacent vowels, citing the following examples:

(1)

<table>
<thead>
<tr>
<th>Example</th>
<th>Meaning</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. saif</td>
<td>‘summer’ (historical emphatic /S/; Aquilina and Isserlin 1981:36)</td>
<td></td>
</tr>
<tr>
<td>b. seif</td>
<td>‘sword’ (Aquilina and Isserlin 1981:36)</td>
<td></td>
</tr>
<tr>
<td>c. dell</td>
<td>‘shadow’ (historical /Zill/; Aquilina and Isserlin 1981:133)</td>
<td></td>
</tr>
<tr>
<td>d. triiqoot</td>
<td>‘ways’ (Aquilina and Isserlin 1981:233)</td>
<td></td>
</tr>
</tbody>
</table>

3 Here and elsewhere, emphasis is denoted by capitalization.
As may be seen in (1a) and (1b), historical /a/ does not raise to /e/ when in the neighborhood of a historically emphatic consonant. The authors also mention that non-emphasized long /a/ diphthongizes to /ie/ (109).

Not only is vowel raising blocked by emphatic consonants, but vowel lowering is induced, as shown in (1c). Finally, in a discussion of the feminine plural suffix (233), the authors note that the form surfaces as either /-oot/ or /-eet/. It is evident from example (1d) that this alternation is governed by the presence of a postvelar consonant, whether guttural (final /q/ or emphatic historical initial /T/).

Borg (1977) provides a more systematic account of emphasis-based alternations in rural Maltese. The focus of his analysis, however, is on effects limited to word-final syllables. Certain distinctions prompted by emphasis occur only in this environment. For example, word-final /uu/ and /ii/ are diphthongized differently according to the presence of emphasis in the environment. /ii/ becomes /ei/ if in a non-emphatic environment, but /ui/ if in an emphatic one (215), while /uu/ becomes /ow/ if in an emphatic environment (if not there is no change) (218). This differential diphthongization according to backness/emphasis status of environment also applies to the word-final short high vowels, including suffixes (/i/ ‘my’, /u/ verbal plural suffix).

Fortunately, further information can be gleaned from Borg’s work. He observes that Classical Arabic /aa/ yields /uu/ in a historically emphatic or guttural environment, but /ii/ elsewhere (215). (When in word-final syllables the resulting /uu/ and /ii/ lower to /oo/ and /ee/, respectively [214-215]). As Aquilina and Isserlin also observed in their saif/seif example, the diphthong /ai/ became /ei/ in non-emphatic environments (216), and raising of the feminine plural suffix is prevented by the presence of an emphatic in the word, even when long /i/ intervenes (217). Also, we may conclude from smiine ‘fat, fem.’ from Standard Arabic samiina that short /a/ is deleted in non-guttural/emphatic environments. This is a logical result if we assume that non-low vowels are deleted in

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4 Borg 1990 argues that a similar phenomenon occurred in Cypriot Arabic, with short /a/s remaining as such only in originally pharyngeal environments. However, the following examples, which he presents in Borg 1997a, reveal that both retention of /a/ and raising to /e/ or /i/ are actually fairly unpredictable.

(2)

| a. basal ‘onions’ from baSal |
| b. kasel ‘laziness’ from kasal |
| c. katt ‘cat’ from qiTT |
| d. fatt ‘it was slight’ from fatt |
| e. peða ‘egg’ from bayDa |

Here we see a failure of /a/ to raise where Borg predicts that it should (2b, 2d) and a diphthong raising where he predicts no effect (2e). Unfortunately, the written tradition that allows access to the Maltese forms is not available for Cypriot Arabic, so without further evidence from an informant we must leave it aside.

5 On the basis of such word-final alternations Borg affiliates Maltese with certain Lebanese dialects in which pausal forms show similar variation. Developing the argument for this affiliation constitutes the primary focus of his article.

6 It is interesting to note that word and/or stem-final position is one of those defined by Beckman as a position of prominence (3). Borg’s diphthongization process, then, is a case of what Beckman terms positional neutralization, in which “some contrast or contrasts are maintained only in a prominent position” (Beckman 1998:5). However, these alternations are not represented in the orthography, and hence my analysis must leave them aside. For further information and arguments concerning Maltese gutturals and final prominence, see Walter 2002.
open syllables, as occurs in many Arabic dialects. In this case the retention of /a/ indicates a previously emphatic or guttural environment, while those /a/ vowels that were raised in the absence of such an environment, as in the example above, no longer remain.

Further support for this analysis derives from the opposition of /tabiiba/ ‘doctor, fem.’ and /habiibe/ ‘sweetheart, fem.’ The /t/ of /tabiiba/ is historically an emphatic, while the /h/ of /habiibe/ derives from a voiceless pharyngeal /\h/. As we can see, both condition the retention of the initial /a/. However, the effect of the /\h/ remained purely local, while that of the emphatic /t/ extended to the right edge of the word to prevent the raising of the word-final feminine ending /a/. This tells us that at an early stage of rural Gozitan Maltese, emphasis spread to the right edge of the word (and possibly further, though there are no available sources on which to test spreading beyond the word). In a serial framework, then, the three words are derived as follows:

(3)

<table>
<thead>
<tr>
<th></th>
<th>/samiina/</th>
<th>/Habiiba/</th>
<th>/Tabiiba/</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/-Raising</td>
<td>semiine</td>
<td>Habiibe</td>
<td>Tabiiba</td>
</tr>
<tr>
<td>Non-low V-Deletion</td>
<td>sMiine</td>
<td>Habiibe</td>
<td>Tabiiba</td>
</tr>
<tr>
<td>Depharyngealization</td>
<td>sMiine</td>
<td>habiibe</td>
<td>tabiiba</td>
</tr>
</tbody>
</table>

It is likely that this spread was unimpeded by blockers of any kind, since the long /i/ would have been a prime candidate to block (see discussion of blockers below). Unfortunately, the degree of spread to the left cannot be determined from Borg’s examples.

2.2 Previous documentation of pharyngealization in Standard Maltese

The third source on the emphatics in Maltese deals with Standard Maltese as of approximately forty years ago. Cowan (1966) observes that Arabic long /a/ corresponds to Maltese long /a/ when adjacent to an emphatic, but otherwise becomes /ie/ (28). The other long vowels, /i/ and /u/, do not change (29). Short /a/ remains as such in emphatic syllables, but is otherwise realized as /el/, while /i/ becomes /e/ in emphatic syllables, but otherwise remains /i/. Short /u/ becomes /o/ in all contexts.

As in Gozitan, all original short vowels are deleted in open syllables except /a/s in emphatic or guttural environments. However, Cowan gives the interesting exception that “a stressed /a/ following an emphatic did not remain /a/ if the following syllable began with ‘ayn: /San9a/ ‘skill’ > Maltese /sena/” (29). This type of example will be discussed at length in the subsequent section on dissimilation.

Note that all of the above authors fail to look for distinctions between the behavior of gutturals and emphatics, thus obscuring the difference between the local effects of the first and long-range ones of the second. That there is such a difference is apparent from their examples, as noted above with respect to tabiba versus habibe. In addition, they only address cases in which the vowel in question is immediately adjacent to an emphatic, or else use the ambiguous phrase “in an emphatic context.” Our task, then, is first to isolate the emphatics as an object of inquiry, and then to determine what

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7 For further information on such local effects, particularly with respect to paradigm alternations, see Brame (1972), which undertakes an extensive survey of the reflexes of Classical Arabic pharyngeals /\h/, /\h/ in Modern Maltese.
exactly constitutes an emphatic context. We shall endeavor to do so by examining the orthographical representation of the dialect, with examples drawn from dictionaries of Maltese. Again, it is important to note that these examples represent not phonetic transcriptions of Standard Maltese as currently spoken, but rather Maltese as spoken at around 1900 in the capital city Valletta.

2.3 Corpus Information on Standard Maltese

The following data set was obtained from a pair of English-Maltese and Maltese-English dictionaries (Busuttil 1900a and Busuttil 1900b). The Maltese forms are given in standard Maltese orthography, in which /j/ represents the glide /y/ and /x/ represents the voiceless fricative /\Sigma/. The realization of /g\allowscriptscriptstyle{\Sigma}/ is variable, corresponding sometimes to vowel length, sometimes to a velar fricative, but the variation is immaterial for our purposes. Finally, emphatic consonants in the Arabic words are represented as capital letters.

<table>
<thead>
<tr>
<th>Maltese</th>
<th>Arabic</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. iswed</td>
<td>‘aswad</td>
<td>‘black’</td>
</tr>
<tr>
<td>deheb</td>
<td>탈아</td>
<td>‘gold’</td>
</tr>
<tr>
<td>sejf</td>
<td>sayf</td>
<td>‘sword’</td>
</tr>
<tr>
<td>b. sajf</td>
<td>Sayf</td>
<td>‘summer’</td>
</tr>
<tr>
<td>kasab</td>
<td>qaSab</td>
<td>‘reed’</td>
</tr>
<tr>
<td>g\allowscriptscriptstyle{\Sigma} addab</td>
<td>@aDDab</td>
<td>‘to anger’</td>
</tr>
</tbody>
</table>

The items in (4) exemplify the reflexes of Arabic /a/ as determined by the presence of pharyngealization. Tokens in words without emphatics, such as those in (4a), are realized as /e/ or /i/ (what governs the distinction is immaterial to this analysis). Those neighboring emphatics, such as those in (4b), still surface as /a/. The following two data sets address directionality and the distance at which these generalizations apply in the word.

<table>
<thead>
<tr>
<th>Arabic</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. mfajjad</td>
<td>mufayyaD</td>
</tr>
<tr>
<td>b. maxxita</td>
<td>ma\allowscriptscriptstyle{\texttimes} iiTa</td>
</tr>
<tr>
<td>c. maxta</td>
<td>ma\allowscriptscriptstyle{\texttimes} Ta</td>
</tr>
<tr>
<td>d. maxsat</td>
<td>ma\allowscriptscriptstyle{\texttimes} aaT</td>
</tr>
<tr>
<td>e. marid</td>
<td>mariiD</td>
</tr>
<tr>
<td>f. marrad</td>
<td>marraaD</td>
</tr>
<tr>
<td>g. rabbat</td>
<td>rabbaaT</td>
</tr>
<tr>
<td>h. abjad</td>
<td>abyaD</td>
</tr>
</tbody>
</table>

Example (5a), as well as (6c,d,e) below, demonstrates the application of non-low vowel deletion. Examples relevant to leftward emphasis spread are also given in (5) above. In each form, the effect of the final or penultimate pharyngeal consonant has extended beyond its own syllable and leftward to the previous one as well, which begins the word. Thus the effect of an emphatic is not limited to adjacent segments, or to the syllable.
Forms containing likely blockers are included, and demonstrate that the spread of emphasis is not blocked by /Σ/ (5b,c,d), by /i/ (5b,e), or by /y/ (5a,h). Note that geminate status makes no difference in the spread of emphasis (5a,b,d).

(6)

a. sajjied Sayyaad ‘hunter’

b. tajjeb Tayyib ‘good’

c. mtawwal muTawwal ‘lengthened’

d. sawwar Sawwaar ‘painter’

e. swat Suwaat ‘beating’

f. bla tfal bi-laa aTfaal ‘childless’

Most of the above generalizations also apply to rightward spread, as shown by the examples in (6). We can see that the effect of emphasis can spread rightward throughout the word, as in (6c,d), and is not blocked by /w/ in these or (6e). In fact, the only attested blocker is geminate /y/, as in (6a). That even in rightward spread blocking occurs only with geminate high front consonants, and not all geminates, is demonstrated by the transparency of /ww/ in the two examples given above. If the /yy/ blocks regularly, it seems likely that geminate /Σ/ and /j/, and perhaps long /i/, would block as well.

The form tajjeb (6b) at first appears to be a counterexample to the blocking effect of /yy/ does not invariably block – in this case the geminate /yy/ seems to have failed to stop historical /i/ from lowering to /e/. However, this case can be attributed to the lowering of /i/ to /e/ in unstressed syllables, postulated in Brame (1972).

Finally, consider example (6f), a lexicalized phrase. One of the limitations in having only dictionaries as source material is that words invariably appear only in citation form, so that it is impossible to check for the spread of emphasis to affixes or beyond the word boundary (both of which would in any case be unlikely to retain contrasts after emphasis spread no longer applied, or to be leveled to one or the other form). However, (6f) suggests that post-word-boundary spread did in fact occur. The phrase’s appearance in a dictionary testifies that it has been lexicalized, so that the /a/ of the negative particle /la/ remained in proximity to the historically emphatic /t/. As we can see, it surfaces synchronically as the emphasized variant of long /a/ rather than as unemphasized /ie/. This indicates that emphasis freely spread past the word boundary.

The vowel changes induced by emphasis spread are summarized in (7) below.

(7)

<table>
<thead>
<tr>
<th>In non-emphatic environments</th>
<th>In emphatic environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/ &gt; /e/</td>
<td>/a/ &gt; /a/</td>
</tr>
<tr>
<td>/i/ &gt; /i/</td>
<td>/i/ &gt; /e/</td>
</tr>
<tr>
<td>/aa/ &gt; /ie/</td>
<td>/aa/ &gt; /a/</td>
</tr>
</tbody>
</table>

8 Likely blockers as determined by the cross-dialectal survey undertaken by Cockerill (2000). Such segments involve articulatory mechanisms that are antagonistic to those necessary for the production of emphatic consonants (e.g. fronting versus backing), as discussed further below.
In summary, we find that these effects obtain throughout the word and possibly farther in Maltese, uninhibited except by geminate /yy/ (and possibly other geminate palatals) when spreading to the right. This patterns with the cross-linguistic generalization that the segments most likely to block emphasis spread are those which contain segments with feature specifications that are articulatorily antagonistic with those of emphasis, particularly [+high] and [+front]. I take these to be the tongue root feature specifications [-ATR, +RTR] (advanced tongue root and retracted tongue root, respectively), for reasons discussed more fully below. Note that this makes no reference to whether or not such blockers are specified for the opposite pharyngeal features as the emphatics, or even whether they possess such features at all. Thus high front segments such as /y/ and /Σ/ are most likely to interfere, rather than (as one might expect) articulatorily similar consonants such as the velars or gutturals. In addition, the asymmetry in spreading behavior comes in a familiar form in that it results in rightward spread being more restricted than leftward spread, a pattern typically observed in other dialects (Cockerill 2000).

2.4 Maltese Guttural Dissimilation

In the forms given in (8) below, emphasis spread would be expected to occur, yet has not.

(8)

a. zebbieg Sabbāa ‘dyer’
b. zebg a Sab a ‘dye’
c. sena San a ‘skill’

Recall too that Cowan’s description of Maltese includes the interesting exception that “a stressed /a/ following an emphatic did not remain /a/ if the following syllable began with ‘ayn: /San9a/ ‘skill’ > Maltese /sena/” (29). While the voiced pharyngeal ayn is the only phoneme that Cowan observes to have triggered this process, we may now observe that the process was in fact more widespread. That this process was triggered by the uvulars as well as the pharyngeals is suggested by the forms (8b,c) (in which the sequence /g/ derives from the historical uvular fricative, rather than the pharyngeal). Example (8c) demonstrates that the dissimilation was in fact not triggered only by following onset segments, as Cowan states, but by any subsequent trigger regardless of its position within the syllable.

This process closely resembles a guttural/emphatic dissimilation process in Palestinian, documented by Davis (1995). Davis gives the following examples of words

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9 The existence of the phenomenon in Maltese as well as in Palestinian Arabic might seem to have implications from an Arabic dialectological perspective. Palestinian is situated within the Levantine dialect cluster. The existence of this process in Maltese at first seems to provide another piece of evidence, if slight, for the thesis of Borg (1977) and others that substantial cross-influences occurred between Levantine and Maltese Arabic occurred, in addition to the more well-known and obvious ones between Maltese and North African Arabic (for a short discussion of the issue and references see Prevaes 1993:4). Makki’s (1983) claim that the same happens in the Southern Lebanese Arabic of Bint Jbail to an emphatic in front of the uvulars /θ/, /Ξ/, or glottal stop deriving from historical uvular stop, seems to point to the same conclusion.
in which a consonant lost its underlyingly emphatic quality when followed by a guttural (1995:480):

(9)

a. [sadaga] ‘charity’ Classical Arabic root: S d q
b. ['aðyag] ‘narrowest’ Classical Arabic root: Z y q
c. [sarax] ‘he screamed’ Classical Arabic root: S r ℹ
d. [sabagh] ‘he dyed’ Classical Arabic root: S b ®

Note that in all of the above instances, the underlyingly emphatic consonant precedes the guttural. When an emphatic follows a guttural it spreads emphasis leftward to the rest of the word, so that any delinking of RTR from the guttural (in Davis’ model) is reinstated. The examples g/addab ‘to anger’ and kasab ‘reed’ from Maltese shows that the same is true in that language, since the second /a/ would have raised to /e/ if the historically emphatic /d/ or /s/ had been de-emphasized. The two dissimilation processes differ in that the South Palestinian dissimilation documented by Davis is restricted to the subset of (historical and underlying) uvulars. Dissimilation in Maltese, on the other hand, involves the full complement of gutturals, including the pharyngeals, as example (8c) demonstrates.

3. Feature Geometric Representations

Dissimilation processes, of course, invite the question of what features exactly are dissimilating. This question is of particular interest concerning the emphatics and gutturals, since their representation is still a matter of some dispute. As the Palestinian process involves only uvulars, while Maltese involves both uvulars and pharyngeals, some way of distinguishing these two classes and the emphatics is necessary. Let us first examine Davis’ explanation for emphasis spread and dissimilation with respect to Palestinian. We will then determine whether it extends to Maltese, and compare more recently proposed feature geometries to evaluate their descriptive and explanatory adequacy.

3.1 The RTR/CP Model

Davis (1995) assigns a pharyngeal node (labeled Phar below) to the three classes uvular, pharyngeal, and emphatic, depending from the node Lower Vocal Tract (LVT below, in contrast to Upper Vocal Tract or UVT). Below it the uvulars are characterized

However, at least one other dialect also has such a process – Saharan Arabic, which is spoken in an area that includes southern Morocco, Western Sahara, Mauritania, and Mali. In this dialect a consonant can lose its original pharyngealization in proximity to a neighboring pharyngealized or uvular consonant, yielding for example sghir ‘small,’ with non-emphatic /s/ (Heath 1987:211). Because Saharan is a North African dialect, it may be that Maltese inherited such a dissimilation process from a North African parent. Alternatively, Maltese, North African and Levantine dialects could have developed the process concurrently and independently. In any case, the presence of guttural dissimilation cannot be viewed as an isogloss indicating affiliation of Maltese with Levantine Arabic.
by RTR (Retracted Tongue Root), while the pharyngeals and emphatics have CP (Constricted Pharynx), as follows:\(^\text{10}\)

\[
\begin{array}{ccc}
\text{Emphatics} & \text{Uvulars} & \text{Pharyngeals} \\
1\text{place} & 2\text{place} & 1\text{place} \\
\text{UVT} & \text{LVT} & \text{UVT} \\
\text{Coronal} & \text{Ph\textbackslash{}ar/PC} & \text{Dorsal} \\
\text{[RTR/RTBack]} & \text{[RTR/B]} & \text{[CP/RTRoot]}
\end{array}
\]

On this analysis, the guttural dissimilation is due to the presence of the privative feature [RTR] (or RTBack). Pharyngeals do not participate as they lack this feature altogether. (The significance of the relevant feature occupying secondary place for emphatics, but sharing primary position for uvulars, remains unclear. This formulation runs into problems when taken in conjunction with Shahin’s and our thesis regarding the distinction between primary and secondary place in spreading processes.)

But as we have seen, the pharyngeals do participate in the almost identical process operative in Maltese. The phenomenon in Maltese is readily explicable in this model if we posit dissimilation of the pharyngeal node that dominates RTR, or assume a high-ranking constraint that bans the presence of more than one pharyngeal node in the word.

However, more recent feature geometric proposals reject altogether both the feature CP and the node Pharyngeal. Pharyngeal is replaced with Tongue Root, which dominates the features [ATR] and [RTR] (Advanced Tongue Root and Retracted Tongue Root, respectively, with plus or minus specifications). This results in the following representations for the relevant segment classes:

\[\text{[RTR/RTBack]} \quad \text{[RTR/B]} \quad \text{[CP/RTRoot]}\]

In later work done by Zawaydeh (1999), the nodes are renamed such that Pharyngeal = Pharyngeal Constriction, while RTR corresponds to Retracted Tongue Back and CP to Retracted Tongue Root. The diagrams given above conflate these two terminologies, and in this way do not correspond precisely to the representations used by either author.

Note that this terminology attributes a phonetic, featural property to a node in the feature geometry. That is, the term implies an articulatory action (that of constriction), not simply a place, as do Coronal, Pharyngeal, Tongue Root, etc. This implication runs counter to Feature Class Theory, a recent formulation of features as governed by classes, not nodes, since class nodes have generally been only “a means of capturing feature class behavior” to begin with (Padgett 1995:386).

\(^{10}\) In later work done by Zawaydeh (1999), the nodes are renamed such that Pharyngeal = Pharyngeal Constriction, while RTR corresponds to Retracted Tongue Back and CP to Retracted Tongue Root. The diagrams given above conflate these two terminologies, and in this way do not correspond precisely to the representations used by either author.

\(^{11}\) Primary place of articulation.

\(^{12}\) Secondary place of articulation.
Unlike CP, both features are motivated independently of the behaviors involving emphatics (Vaux 1996, 1999). Dominating ATR as it does, having a Tongue Root node must be a property of many segments besides those we classify as guttural/emphatic. Thus its mere presence, as in a [+ATR] vowel or voiced obstruent, should not be able to trigger the observed dissimilation. Another way must be found to capture the classes of dissimilating segments.

3.2 The Dorsal/RTR Model

Shahin (1997) proposes the following representations (in which TR abbreviates Tongue Root):

Shahin holds that Tongue Root dominates both RTR and ATR, but believes that ATR is irrelevant to pharyngealization spread and thus does not give assumptions about ATR specifications. What distinguishes this geometry from that of Vaux (1999) and Halle, Vaux and Wolfe (2000), presented below, is the inclusion of [dorsal] as a secondary articulation for emphatics, following Herzallah (1990). Herzallah argues that this is necessary in order to obtain a verb stem /u/ variant in the environment of emphatics and sometimes uvulars through spreading of [dorsal], but a back /A/ variant adjacent to the pharyngeals proper (Herzallah 1990:180-186). However, as Halle, Vaux and Wolfe (2000) demonstrate, this is unnecessary when emphatics and uvulars share the features [+back, -low] (and pharyngeals are [+back, +low]). Thus attributing the feature [+dorsal] to the emphatics is an unnecessary complication.
3.3 *The ATR/RTR Model*

Having rejected these feature geometrical representations for various reasons, it remains to be seen how the one I adopt handles Palestinian and Maltese guttural/emphatic dissimilation. I argue in favor of the following feature specifications as dependents of the Tongue Root node (introduced in Vaux 1999, Halle, Vaux & Wolfe 2000; geometrical structure representations as shown in (11)):

\[
\begin{align*}
\text{[+ATR, +RTR]} & \quad \text{Does not exist} \\
\text{[+ATR, -RTR]} & \quad \text{Voiced obstruents}^{13} \\
\text{[-ATR, +RTR]} & \quad \text{Pharyngeals; emphatics when secondary} \\
\text{[-ATR, -RTR]} & \quad \text{Epiglottals; uvulars when secondary}
\end{align*}
\]

The above featural assumptions can unproblematically account for the Maltese dissimilation process, in which emphatics dissiplate from both uvulars and pharyngeals. However, the Maltese dissimilation must be accounted for not by reference to the pharyngeal node, as Davis’ representation requires, but through the feature specification [-ATR]. As the specifications given in (13) make clear, this feature is shared by all three classes of segments – pharyngeals, emphatics, and uvulars. Reference to the dominating node (in this framework, Tongue Root) is inadequate, as it would also involve voiced obstruents.

Slightly more difficult is distinguishing the pharyngeals from the uvulars and emphatics, as occurs in the Palestinian process. The only means available to do so in the proposed feature geometry is to stipulate that the [-ATR] dissimilation process applies only to secondary articulations. This adequately constrasts the emphatics and uvulars with the pharyngeals, whose sole place of articulation is the primary one. Moreover, this type of distinction is by no means rare among the world’s languages. In fact, such a distinction has been documented for at least two languages with respect to the feature RTR itself – namely, in St’at’imcets’ Salish (Shahin 1997:57) and Chilcotin (Ananian and Nevins 2001:8-9). Alternatively, if pharyngeal is characterized as a glide, a plus versus minus consonantal feature specification too could account for the difference in behavior.\(^{14}\)

Thus in Maltese a [-ATR] specification prompts dissimilation of pharyngeals and uvulars from emphatics, while in Palestinian the same applies, but only to secondary (or consonantal) articulations. This excludes the primary pharyngeals as triggers, which is the desired result.

As for the regular emphasis-spreading process, I take the view that the spreading element is a [+RTR] specification, situated in the feature geometry as depicted above. This view is not incompatible with that of Davis (1995), once it is taken into consideration that I assume a positive feature specification rather than a privative feature.\(^{15}\)

\(^{13}\) The necessity of attributing a [+ATR] specification to voiced obstruents is convincingly documented in Vaux (1996, 1999).

\(^{14}\) My thanks to Morris Halle (personal communication) for pointing out this alternative.

\(^{15}\) The Maltese vowel effects, at whatever stage of the language in which they apply, can then be obtained with contextual rules based on the changes given in (7). The same output results may be obtained via the following constraint ranking:
4. Conclusion

The Maltese dialect of Arabic, which has lost the consonantal contrast between emphatic and non-emphatic (pharyngealized) segments, has been shown to synchronically demonstrate the effects of these consonants via its vowel inventory. An RTR-spreading process extends leftward to the word boundary with no blocking segments, and rightward to the word boundary unless blocked by a geminate high front glide. This process exhibits the cross-linguistic tendency of RTR-spread to 1) extend further leftward than rightward and 2) be blocked by segments with antagonistic (rather than contradicting) feature specifications, thus conforming to typological predictions made by Davis (1995), McCarthy (1997), and Watson (1999).

Maltese also exhibits a guttural dissimilation process similar to one previously documented carefully only in South Palestinian Arabic. A re-examination of feature geometry proposals in the light of this complication suggests that one which makes reference to an independently motivated Tongue Root node captures the data as completely as earlier accounts. Moreover, the existence of the process intimates that such dissimilation is more common than has heretofore been observed, and suggests a fruitful area for future research, given its obvious relevance to the phonology of the lower vocal tract.

REFERENCES


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RTR-LEFT >> *RTR/HI >> IDENT:HI, RTR-RT >> RTR-CONTIG, IDENT:-LO >> *RTR/-LO

The constraints RTR-LEFT and RTR-RT align [+RTR] feature specifications with the respective word edges. *RTR/HI accounts for both the inventory of blockers (with a geminate qualification), and the lowering of the short vowel /i/ to /e/. RTR-CONTIG ensures that the blockers induce opacity rather than transparency by requiring that [+RTR] specifications in a word be adjacent. Finally, IDENT:-LO guarantees that /i/ does not lower any further from /e/ ([+low]) to /a/ ([+low]), and *RTR/-LOW keeps the Maltese low vowels in emphatic environments (with a [+RTR] specification) from raising to become mid vowels, which otherwise happens across the board.


