Doubled verbs and syncope resistance in Iraqi Arabic: not antigemination
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1. Introduction
Antigemination is defined as the failure of a rule to apply if the output would violate the OCP by creating a sequence of two identical consonants (McCarthy 1986). For example, in Afar, a Cushitic language, syncope applies to unstressed vowels in two-sided open syllables as shown in (1e,f). It is resisted in (1g,h) if the output would produce a sequence of two identical consonants, a violation of the OCP:

(1) Afar (Bliese 1981)
   a. digib-t-é she married        e. digb-é he married
   b. wager-t-é she reconciled    f. wagr-é he reconciled
   c. xarar-t-é she burned        g. xarar-é *xarré he burned
   d. danan-t-é she was hurt      h. danan-é *danné he was hurt

Rose (2000) argues that resistance to syncope is not in fact avoidance of an OCP violation, but avoidance of creating geminate consonants. A geminate automatically results from the juxtaposition of two identical consonants. A similar assumption is found in Keer (1999) who assumes automatic ‘fusion’ of the consonants.

Iraqi Arabic also displays ‘antigemination’, according to McCarthy (1986), based on verbs such as ˝aajij-at ‘she argued with’ compared to xaabr-at ‘she telephoned’. Nevertheless, I argue in this article that Iraqi only superficially resembles Afar in this respect. In general, Iraqi appears to prefer gemination to a CVVC sequence with identical consonants. The antigemination cases only arise when the preceding syllable is heavy. Failure of syncope is not wholesale avoidance of geminates, but avoidance of geminates in a specific context - when terminating a syllable containing a long vowel, or when syncope would result in homophony with another form.

This article is organized as follows. First, I introduce syncope in Iraqi Arabic and compare it with Classical Arabic. I propose an account of syncope in the two languages which relies on a preference for geminates over OCP consonant violations across an intervening vowel. In section 3, I argue that syncope resistance in Iraqi Form III and Form VI doubled verbs is in fact avoidance of a long vowel-geminate sequence, which poses problems for constraints pertaining to moraic realization. I then show how Form II and Form V doubled verbs resist syncope for an alternate reason - to avoid homophony with other patterns. In section 4 I show how the preference for geminates over OCP violations extends to broken plurals and adjectives.

2. Syncope and Iraqi vs. Classical Arabic
Regular Form I verbs in Iraqi undergo syncope between the two final consonants of the verb stem (2e-f) when vowel-initial suffixes are added. In Iraqi all short unstressed...
vowels in this position are subject to syncope. The doubled verbs (assumed to arise from a biliteral root) have the CVCC shape (all data from Erwin 1963):

(2)

<table>
<thead>
<tr>
<th></th>
<th>Regular verb</th>
<th>Doubled verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kitab  'he wrote'</td>
<td>kitb-at  'she wrote'</td>
</tr>
<tr>
<td>b.</td>
<td>ṭakal  'he ate'</td>
<td>ṭakl-at  'she ate'</td>
</tr>
<tr>
<td>c.</td>
<td>dazz  'he sent'</td>
<td>dazz-at  'she sent'</td>
</tr>
<tr>
<td>d.</td>
<td>sadd  'he closed'</td>
<td>sadd-at  'she closed'</td>
</tr>
</tbody>
</table>

Like most of the modern Arabic dialects, in Iraqi Arabic there is no vowel between identical final consonants in many verb forms throughout the inflectional paradigm, no matter the nature of the following suffix (see Hoberman 1989). This is true of Form I (CVCaC) as seen above in (2), but also for Forms IV (?a-CCVC), VII (nCVCVC), VIII (CtVCVC), IX (CCVC) and X (staCCVC). Form IX always has a doubled final consonant and is derived from a triliteral root: i.e. ṭall. The regular verbs on the left in (3) are contrasted with the doubled verbs on the right. The second stem vowel is either absent in the doubled verbs (Forms I, VII, VIII), or the position of the only stem vowel is shifted (Form IV and Form X), so that the doubled verbs have the shape CVCC at right stem edge, whereas the regular verbs have the shape CCVC. When word-final with no following vowel-initial word, a geminate is pronounced as a singleton, but still attracts stress to that syllable.

(3)  

<table>
<thead>
<tr>
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<th>Regular verbs</th>
<th>Doubled verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Form I ṭakal  'he ate'</td>
<td>sadd  'he closed'</td>
</tr>
<tr>
<td>b.</td>
<td>Form IV ṭanjaz  'he accomplished' ṭašarr  'he insisted'</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Form VII nkumaš  'he was caught' nýašš  'he was cheated'</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>Form VIII xtilaf  'he differed' ṭṭarr  'he was forced'</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>Form X stajwab  'he interrogated' staṭadd  'he got ready'</td>
<td></td>
</tr>
</tbody>
</table>

With consonant-initial subject suffixes (/t/- 1s, 2sm; /-tū/ 2sf; /-tu/ 2p; /-na/ 1p), the doubled verbs with final gemination have a special long [ee] not found in the regular verbs (note that the /-t/ suffix for 2ms and 1s is realized as [-it] with epenthesis in (4a,d) as Iraqi Arabic does not allow final clusters).

(4)  

<table>
<thead>
<tr>
<th></th>
<th>Regular verb</th>
<th>Doubled verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>ṭakál-it  'you (ms.) ate'</td>
<td>dazz-eet  'you (ms.) sent'</td>
</tr>
<tr>
<td>b.</td>
<td>ṭakal-ti  'you (fs.) ate'</td>
<td>dazz-eeti  'you (fs.) sent'</td>
</tr>
<tr>
<td>c.</td>
<td>ṭakal-tu  'you (pl.) ate'</td>
<td>dazz-etu  'you (pl.) sent'</td>
</tr>
<tr>
<td>d.</td>
<td>ṭakál-it  'I ate'</td>
<td>dazz-eet  'I sent'</td>
</tr>
<tr>
<td>e.</td>
<td>ṭakal-na  'we ate'</td>
<td>dazz-eena  'we sent'</td>
</tr>
</tbody>
</table>

The doubled verbs therefore have generalized to the CVCC shape, i.e. ṭazz-. In Iraqi Arabic, there are no alternations between a stem like ṭazz and a form like ṭazzz within a
given verb measure (i.e. Form I or Form IV). We can provisionally conclude from these data that Iraqi Arabic displays a preference for geminates in the final doubling verb forms.

The doubled verbs reflect the Classical Arabic pattern generalized across the inflectional paradigm. In Classical Arabic there is a process referred to as 'Identical Consonant Metathesis' in Brame (1970), which either syncopates or metathesizes a vowel in an open syllable between two identical consonants in the verb stem. Although Brame analyzes syncope as metathesis followed by vowel shortening (/madada/ \[\rightarrow\] [maadda] \[\rightarrow\] [madda]), the surface result is loss of the vowel between two identical consonants¹. A regular Form I perfective stem has the shape CVCVC throughout the paradigm, i.e. *katab-tu* 'I wrote' and *katab-a* 'he wrote' (5a,d). A verb with final doubling has the shape CVCC when followed by vowel-initial affixes as in (5e-f) (examples from McCarthy 1986a and Brame 1970):

```
(5) a. katab-tu  I wrote  d. katab-a  'he wrote'
b. samam-tu  I poisoned  e. samm-a  'he poisoned'
c. madad-tu  I stretched  f. madd-a  'he stretched'
```

In Classical Arabic, syncope only applies between identical consonants, whereas in Iraqi, syncope applies between non-identical consonants, and the syncopated doubled form with a geminate, *samm-* occurs throughout the paradigm.

Previous analyses of Classical Arabic syncope in doubled verbs focused on the shared 'long-distance geminate' structure of the identical consonants (McCarthy 1986, Moore 1990), encoding this directly into the syncope rule or representation. This is illustrated with a slightly modified form of the rule given in McCarthy (1986):

```
(6) \[\alpha\]
\[\begin{array}{c|c|c|c|c|c}
V & C & V & C & V & V\\
1 & 2 & 3 & 4 & 5 & 1
\end{array}\]
```

Long-distance geminates are rejected in Gafos (1998) and Rose (1997), and are instead analyzed as reduplication. In Rose (2000) I argue that the driving force behind Classical Arabic syncope in doubled verbs is to avoid an OCP violation caused by the two identical consonants. The OCP is violated by identical consonants across an intervening vowel in verb forms such as *samam-tu*. A geminate structure, even one arising from syncope, does not violate the OCP. Striking evidence for the preference for geminates over a C₁VC₁ sequence comes from Syriac (Hoberman 1989). Biliteral roots are positioned to avoid vowels occurring between identical consonants (7c-d), even if this violates the normal left-to-right distribution of root consonants in Semitic (7a-b), and results in discrepancies in stem shape between the members of the paradigm:

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(7)
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¹ Metathesis occurs in imperfect forms: *ya-ktub-u* 'he writes vs. *ya-mudd-u* 'he stretches'.
(7) Root pk 'smash' ktb 'write'
   a. pekk-et ketb-et Class 1 Perfect 1sg
   b. paakk-aa kaatb-aa Class 1 Act. Participle 2sg fem.
   c. te-ppok *te-pkok te-ktob Class 1 Imperfect 2sg masc.
   d. appek *apkek akteb Class IV Perfect 3sg masc.

Hoberman also notes the parallel with the Classical Arabic case and suggests that long-distance geminates are more marked than regular geminates.

A similar preference is found in Nukuoro (Caroll & Soulak 1973). Intensive reduplication takes the prefixal shape CVCV (8a-c) unless the first two consonants are identical, in which case the shape is CVC (8d-f). Maximal reduplication is not achieved to reduce the number of OCP violations.

(8) Base Intensive
   a. balavini bala-balavini 'awkward'
   b. badai bada-badai 'meddle in others' affairs'
   c. gili gili-gili 'coral rubble; skin in an unhealthy condition'
   d. bobo bob-bobo 'rotten'
   e. lili lil-lili 'easily angered'
   f. nanu nan-nanu 'complain repeatedly'

These cases illustrate that within and outside Semitic, a C_{1}VC_{1} structure is dispreferred.

Syncope in Classical Arabic also occurs to avoid an OCP violation. It is better to have a geminate consonant than an OCP violation. Three constraints are utilized in Optimality Theory to achieve this result:

(9)
OCP A sequence of adjacent identical segments is disallowed (under consonant adjacency)
*GEM Long consonants are disallowed
MAX_{1O} Every element of the input has a correspondent in the output (no deletion)

In Classical Arabic, if the OCP is ranked above *GEM and the constraint preventing deletion, MAX_{1O}, syncope results, as shown in the following tableau:

(10) Classical Arabic

<table>
<thead>
<tr>
<th></th>
<th>OCP</th>
<th>MAX_{1O}</th>
<th>*GEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>madad-a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. madda</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. madada</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In contrast, a regular verb would not undergo syncope since there are no violations of the OCP:
In the modern Arabic dialects, syncope has become a more widespread deletion process, applying generally to unstressed short vowels in two-sided open syllables. In most dialects, only high vowels are deleted, but in Iraqi and Syrian all vowels may be deleted, including /a/ (Farwaneh 1995:102). I formulate the deletion imperative as follows (see Kager 1997 for an alternate formulation of syncope):

\[(12) \quad *\text{UNSTRESSED V} (\ast \tilde{V}) \]
\[\ast\text{Unstressed short vowel in two-sided open syllable}\]

Unlike Classical Arabic, \(\ast\tilde{V}\) is ranked over \(\text{MAX}_{1-O}\) in Iraqi.

Turning now to the doubled verbs that have a consistent final geminate, such as Form I \textit{dazz}, there are two possible analyses. One analysis assumes that there is an underlying shape which matches the regular verb forms, /CvCvC/ in the case of the perfective. Deletion occurs to satisfy the syncope requirement, and to avoid violating the OCP. This entails that the OCP must be ranked over \(\ast\text{GEM}\), as in Classical Arabic. This is shown in (14):

\[(14) \quad \text{dazaz-at} \quad \text{OCP} \quad \ast \tilde{V} \quad \text{MAX}_{1-O} \quad \ast\text{GEM}\]

The other alternative is to assume that biliteral verbs have lexicalized to the CVCC shape and never alternate. Therefore Lexicon Optimization (Prince & Smolensky 1993, Inkelas 1994, Yip 1996) dictates positing CVCC as the input form. The constant for the perfective template would then be bimoraicity (CVCVC or CVCC), not bisyllabicity. Epenthesis will not occur to match the bisyllabic Form I shape of regular verbs (CVCVC) due to the high-ranking OCP constraint:

\[(15) \quad \text{dazz-at} \quad \text{OCP} \quad \ast \tilde{V} \quad \text{MAX}_{1-O} \quad \ast\text{GEM}\]

Each of these analyses works to select the correct output candidate, and each requires the ranking of OCP > *GEM. The second analysis is further supported by the behavior of consonant initial suffixes, which are of the shape *dazz-ee* rather than *dazaz-. The difference between Iraqi and Classical Arabic is the ranking of the syncope constraint, which is high-ranked in Iraqi, but not in Classical Arabic. In Classical Arabic, the only syncope witnessed is driven by a desire to avoid violating the OCP rather than explicitly to satisfy syncope requirements. This concludes the discussion of regular syncope in Iraqi Arabic. I now turn to the cases of syncope resistance, the purported cases of 'antigemination'.

3. Resistance to syncope

The verb forms which do not have final geminate consonants are Forms II, III, V and VI, which all share the property that the initial syllable of a regular stem is heavy, either CVC or CVV. The doubled verbs match the shape of the regular verbs, as shown below in (16). Since Form V and VI are derived from Forms II and III respectively, I will only be discussing the behavior of Forms II and III.

(16)  

<table>
<thead>
<tr>
<th>Regular</th>
<th>Doubled</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>baddal 'change'</td>
</tr>
<tr>
<td>III</td>
<td>qaaran 'compare'</td>
</tr>
<tr>
<td>V</td>
<td>t-baddal 'be exchanged'</td>
</tr>
<tr>
<td>VI</td>
<td>t-xaabar 'talk on the telephone'</td>
</tr>
</tbody>
</table>

Syncope optionally applies to regular Form II verbs, which have a medial geminate (17d-e). If syncope occurs, the geminate is reduced to a singleton. Syncope does not apply if the final consonant is identical to the geminate (17g). Instead, the vowel is raised from /a/ to [i] (or [u]).

(17)  

<table>
<thead>
<tr>
<th>Form II</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. sajjal 'he registered'</td>
</tr>
<tr>
<td>b. baddal 'he changed'</td>
</tr>
<tr>
<td>c. baddad 'he wasted'</td>
</tr>
</tbody>
</table>

Syncope applies to regular Form III verbs, producing a medial CVVC syllable (18d-e). Syncope is resisted with doubled verbs (18f), and vowel raising occurs.

(18)  

<table>
<thead>
<tr>
<th>Form III</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. xaabar 'he telephoned'</td>
</tr>
<tr>
<td>b. saafar 'he went on a trip'</td>
</tr>
<tr>
<td>c. ḥaajaj 'he argued with'</td>
</tr>
</tbody>
</table>
Derived adjectives illustrate the same basic pattern (Majdi & Winston 1993):

(19)

a. mitkarrir-a 'being repeated'
b. mitsammim-a 'being poisoned'
c. mitfaakik-a 'being untied'
d. mitlaaziz-a 'being crowded'

Classical Arabic also shows no syncope in these Forms. In the case of Form III, this could be attributed to ban on medial CVVC syllables in Classical Arabic. Such an analysis is not available for Iraqi, which allows syncope to produce such syllables in non-doubled verbs. I now examine past solutions to this problem.

3.1 Former analyses of antigemination

Odden (1978) proposes one of the earliest treatments of Iraqi Arabic resistance to syncope. He encodes the relationship between the final consonant and the medial geminate directly into the rule description, as shown in (20):

(20) \[ V \rightarrow \emptyset / V (C_i) C_i \ldots C_j V \text{ where } i \neq j \ 
\text{[-stress]} \]

Syncope only applies when the surrounding consonants are non-identical.

McCarthy (1986) proposes that the distinction between Classical Arabic and Iraqi Arabic syncope patterns is the ordering of the syncope rule with respect to the operation of Tier Conflation. In an autosegmental analysis, with vowels and consonants arrayed on separate tiers, Tier Conflation is the mechanism which collapses tiers into a single linearized form. Classical Arabic syncope applies before Tier Conflation, as shown in (21):

(21) \[
\begin{array}{c}
\text{s} \\
\text{m}
\end{array}  \hspace{1cm}  \begin{array}{c}
\text{s} \\
\text{m}
\end{array}  
\begin{array}{c}
\text{C} \ v \ C \ v \ C \\
\downarrow \ \\
\text{a}
\end{array} \rightarrow \begin{array}{c}
\text{C} \ v \ C \ v \ C \\
\downarrow \ \\
\text{a}
\end{array} \]

No OCP violation results as the identical consonants are still doubly linked as a long-distance geminate.

Iraqi Arabic syncope, on the other hand, applies after Tier Conflation. Tier Conflation aligns the consonantal and vocalic tiers, producing a linearized structure, and splitting apart the long-distance geminate into two separate consonants. If syncope occurred after Tier Conflation, the two identical consonants would be adjacent and constitute an OCP violation, as shown below in (22).
McCarthy does not assume that two sequences of identical consonants are automatically fused into a geminate. Note that under this analysis, one must assume that other forms of doubled verbs with consistent final geminates, such as *dazz*, must have an underlying geminate consonant.

Finally, Majdi (1988) and Majdi & Winston (1993) propose that the difference between verbs like /baddalat/ --> *badlat* that allow syncope and verbs such as *badlidat* that do not is an underlying difference in the specification of the vocalic slot, as shown in (23):

\[(23) \quad \text{baddVdat} \quad V = [+\text{seg}] \]
\[\text{baddVlat} \quad V = [-\text{seg}] \]

In (23a), a V position specified as [+seg] will be realized as the unmarked vowel [i] producing [baddidat]. A V position specified as [-seg] will be unrealized, giving the effect of syncope: [badlat]. In this manner, they are also able to capture the presence of the vowel [i] in the final position of the verb stem, claiming in essence that it is an epenthetic vowel.

All of these analyses invoke specification of representation. Either the identical consonants are invoked in the rule formulation or the underlying vowels are encoded directly into the representation. Or specific ordering between syncope and other rules is invoked. All analyses miss an important generalization: Iraqi syncope is resisted in doubled verbs only when the preceding syllable is heavy. Thus, it is not simply reference to identical consonants that prevents syncope. Iraqi tolerates CVVC medial syllables, except when the coda is the first half of a geminate consonant. The licensing of the geminate consonant following a long vowel leads to syncope resistance.

### 3.2 Forms III and VI: Geminates avoided following long vowels

Broselow (1992), Broselow, Huffman, Chen & Hsieh (1995) and Broselow, Huffman & Chen (1997) analyze medial CVVC syllables in Levantine (Jordanian, Syrian, Lebanese) Arabic as bimoraic, with the coda consonant adjoined to the vocalic mora as follows:

\[(24) \quad \sigma \\
\mu \quad \mu \\
| / | \\
V C \]

Supporting evidence for the shared structure come from measurements of long vowels in open syllables versus closed syllables. The former are significantly longer than the latter (a ratio of 1.9 to 1.6, with a short vowel open syllable measuring approximately 1).
Sharing of the mora between vowel and coda consonant shortens the length of the vowel (see Hubbard 1994 for arguments on the connection between phonetic duration and moraic structure). This compares to Egyptian Arabic, which neutralizes the distinction between long and short vowels in closed syllables. Broselow, Huffman & Chen (1997) take this to be an argument for mora loss rather than mora sharing.

The shared mora structure in (24) (or an equivalent in which the C is linked directly to the syllable node) avoids violating a general ban on trimoraic syllables, which are rare in comparison to mono- and bimoraic syllables in the languages of the world. This is expressed by the following constraint:

(25) SYLLBIN Syllable weight should not exceed two moras
(Broselow, Huffman & Chen 1997)

A problem arises if the coda consonant of a syllable in (24) were the first half of a geminate. This would cause a violation of the universal requirement that geminate consonants be minimally monomoraic (Hayes 1989), i.e. bear a mora which is unshared with the preceding vowel:

(26) MORAIC GEMINATES

µ  Geminates must bear their own mora
| /  
C  

Broselow, Huffman, Chen & Hsieh (1995) report that coda consonants closing long vowel syllables are significantly shorter than those closing short vowel syllables in Levantine Arabic. Mora sharing affects both vowel and consonant durations, rendering a shared moraic consonant shorter than a normal moraic consonant. The constraint NO SHARED MORA, proposed in Broselow, Huffman & Chen (1997) captures the same effect as MORAIC GEM, but pertains to all segments that share moras, not just geminates, so is inappropriate here. A geminate consonant could not occur as the coda of a CVVC syllable without violating one of these requirements. If the geminate coda bears its own mora, the result is a trimoraic syllable, violating SYLLBIN. But if it shares a mora with the preceding vowel, it violates the requirement that all geminates bear their own mora (MORAIC GEM). Iraqi Arabic has a syllable structure similar to other Levantine dialects, particularly Syrian, and the same structure is applicable to Iraqi. The solution that Iraqi Arabic adopts to this dilemma is to block deletion of the vowel which would create such a syllable, even if blocking would result in an OCP violation. This entails that the OCP is ranked lower than SYLLBIN and MORAIC GEM. The constraint requiring syncope is also ranked lower than these constraints:
This example shows that syncope is resisted in doubled verbs when the initial syllable is CVV. One benefit of this analysis is that the same ranking of OCP > *GEM used to explain Classical Arabic syncope as well as the shape of Form I doubled verbs (dazz) is still in place.

The change of the vowel from /a/ to [i] (or [u]) is often termed vowel raising. Broselow (1992) argues that the reason the vowel changes to [i] in a form like [haajijat] is that syncope occurs, but is then repaired by epenthesis; the epenthetic vowel is [i]. This also occurs with quadriliteral forms: /xarmaš-at/ --> [xarmišat] 'she scratched'. In other words, syncope applies blindly to unstressed open syllables with no regard for the fact that the output would violate the syllable structure constraints of the language. The violation is then repaired. This is akin to a Duke-of-York derivation, with the exception of the quality of the vowel.

In an OT framework, such multi-step derivations are not allowed. Instead, we must examine the reasons behind the vowel raising. The syncope context, an unstressed short vowel in an open syllable, is a common cross-linguistic weak position that favors reduction (see Farwaneh 1995 on weak Ci syllables in Arabic). If deletion is not possible, the next best option is for the vowel to raise to a less-sonorous vowel, either [i] or [u], a common form of reduction (Crosswhite 1999b). The choice of high vowel is roughly dependent on surrounding consonants, with labial consonants conditioning [u]. Crosswhite proposes the following universal ranking of the markedness of unstressed vowels. This predicts a typology of vowel reduction processes

\[(28) \quad *\text{Unstressed } a > * \text{Unstressed } e, o > * \text{Unstressed } i, u, \emptyset\]

In Iraqi Arabic, /a/ is raised to [i] or [u]. This is modeled in the following tableau, whereby *\(\hat{V}\) is split up into *Unstressed a and *Unstressed i,u.

\[(29)\]

In Iraqi Arabic, /a/ is raised to [i] or [u]. This is modeled in the following tableau, whereby *\(\hat{V}\) is split up into *Unstressed a and *Unstressed i,u.

\[\begin{array}{|c|c|c|c|}
\hline
\text{haajaj-at} & \text{SYLLBIN} & \text{MORAIC} & \text{OCP} & *\hat{V} & \text{MAX}_{1,0} \\
\hline
\mu\mu\mu \quad \text{a. haaj.jat} & *! & & & & \\
\mu\mu \quad \text{b. haaj.jat} & *! & & & \ast \ast \\
\mu\mu\mu \quad \text{c. haa.ji.jat} & & & & & \\
\hline
\end{array}\]

Majdi & Winston (1993:175) note that raising is not as widespread as former analyses have suggested. They cite the following examples in which no syncope or raising occurs:

\[\begin{array}{|c|c|}
\hline
\text{haajaj-at} & \text{*Unstressed a} & \text{*Unstressed i,u} \\
\hline
\text{a. haajajat} & *! & \ast \\
\hline
\text{b. haajijat} & & \ast \\
\hline
\end{array}\]

\[\text{In Syrian Arabic (Cowell 1964), which has very similar patterns to Iraqi, } /a/ \text{ raises to } [\emptyset].\]
The lack of syncope is not a result of level ordering or of syncope being restricted not to apply when object pronoun suffixes are added. Syncope does apply in the following forms:

(31)  
a. dirásit  'I studied'  dirasta  'I studied it (m.)'
b. ybaddil  'he changes'  ybadla  'he changes it (m.)'
c. ?axaabur  'I phone'  ?axabra  'I phoned him'

Syncope is subject to a number of restrictions, particularly as pertains to the vowel [a]. For example, [a] is dropped in nouns if preceded by a guttural: bahar 'sea' → bahreen 'two seas', but not when preceded by another consonant: nafar 'person' → nafareen 'two persons'. It is also not dropped if the preceding syllable contains a long vowel in nouns: qaalab 'mold' → qaalabeen 'two molds'. However, syncope does apply in a comparable construction in verbs: xaabar-at → xaabrat 'she telephoned'. As for the first verb in (30a), it differs in stress pattern from comparable forms given in Erwin (1963). For example Form I verbs of this shape are reported to have penultimate stress: dirába 'he hit him'. Syncope should not apply to stressed vowels. Raising only occurs in medial open syllables, the weakest syllables in Arabic. In summary, the facts concerning syncope are complicated and a complete analysis is beyond the scope of this paper. It is important for our purposes to remember that syncope does not occur with doubled verbs, no matter the morphological structure or lexical class.

Finally, it should be pointed out that the VVC_C sequence is not completely banned in Iraqi Arabic. It is attested in the CVVCC template of Form I active participles and adjectives: daazza 'having sent it (m.)' (cf. laabsa 'wearing it (m.)') or xaasxa 'special (f.)' haadda 'sharp (f.)'. In these cases, the templatic shape requirement overrides the ban on trimoraic syllables and moraic geminates. Furthermore, the sequence VVC_C may also arise across morpheme boundaries, as in masjuun-na 'our prisoner'. The benefit of the OT analysis is that it allows for the avoidance of this structure in one area of the grammar but not in another, depending on the constraint ranking. A phonetic study investigating the duration of these long vowels would be beneficial in testing whether they exhibit mora sharing with the following geminate consonant.

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3 Metathesis may also occur in addition to vowel raising in imperfect and imperative forms of Class I verbs and in feminine nouns ending in -a, ex. yilbas 'he wears' vs. yilibsun 'they wear' (*yilbasun or *yilbusun) or sitratha 'her jacket' vs. sitirta (*sitirta or *sitrta) 'his jacket'. A complete analysis of these forms goes beyond the scope of the paper, but in most cases, the vowel would be unstressed, perhaps conditioning the raising. See Broselow (1992) for an analysis of these forms as syncope followed by epenthesis.
3.3 Forms II and V

Forms II and V also have a heavy initial syllable due to gemination of the medial consonant.

<table>
<thead>
<tr>
<th>Regular verbs</th>
<th>Doubled verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form II</td>
<td></td>
</tr>
<tr>
<td>a. baddal</td>
<td>e. baddad</td>
</tr>
<tr>
<td>b. wannas</td>
<td>f. marrar</td>
</tr>
<tr>
<td>Form V</td>
<td></td>
</tr>
<tr>
<td>c. t-baddal</td>
<td>g. t-xaşşaş</td>
</tr>
<tr>
<td>d. t-wannas</td>
<td>h. t-maddad</td>
</tr>
</tbody>
</table>

Syncope occurs optionally with non-doubled verbs, but if it occurs, the geminate is reduced to a singleton: baddilat / baddat 'she changed'. Doubled verbs do not reduce: baddidat 'she wasted' *baddat (Erwin 1963:91). Avoidance of a form such as baddat is attributed to homophony avoidance. A syncopated form has the same shape as a doubled Form I verb. Verbs that have both Form I and Form II face a significant neutralization problem if syncope were to apply. For example, the doubled verb marrat 'she passed' has a Form II marrirat 'she helped to pass' (Majdi & Winston 1993:176), as shown in (33a,b) If syncope were to apply to the latter Form II, the two forms would be identical: *marrat. This problem does not occur with regular Form I verbs because the initial vowel is always high, either [i] or [u], except with two exceptional verbs akal 'eat' and axađ 'take'. Thus, even if the vowel is dropped and the geminate reduced to a singleton, the initial vowel indicates Form I or Form II membership, as shown in (33c,d) for the verb diras 'study'.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. marr-at</td>
<td></td>
<td>'she passed'</td>
</tr>
<tr>
<td>b. marrar-at → marrirat *marrat</td>
<td></td>
<td>'she helped to pass'</td>
</tr>
<tr>
<td>c. diras-at → dirstat</td>
<td></td>
<td>'she studied'</td>
</tr>
<tr>
<td>d. darras-at → darsat</td>
<td></td>
<td>'she taught'</td>
</tr>
</tbody>
</table>

Homophony avoidance is formalized in Crosswhite (1999a) as ANTI-IDENT and pertains to complete identity of all segments in two forms: For two forms $S_1$ and $S_2$ where $S_1 \neq S_2$, $\exists \alpha, \alpha \in S_1$ such that $\alpha \neq \overline{\alpha}$. A segment in one word cannot be identical to its correspondent in another form. In contrast, homophony avoidance in Arabic pertains to avoidance of identical templatic shapes, which convey morphological information. It is better captured by the constraint MORPHEMIC DISJOINTEDNESS (McCarthy & Prince 1995): Distinct instances of morphemes have distinct contents, tokenwise. Form I and Form II must be distinguished by their templatic shape. Any reduction which renders them identical in shape will be avoided.  

4 Since Form V is derived from Form II, I assume that it maintains the output shape of Form II. An alternate, less tenable analysis might rely on the fact that Form V doubled verbs would have the same shape as final weak verbs if syncope applied. For example, Form V verbs that have a weak final glide take the
In conclusion, I have argued that syncope resistance in Iraqi Arabic is not simply avoidance of deletion of a vowel between identical consonants, but rather it references the nature of the preceding syllable. A long vowel-geminate sequence is avoided in the language. In addition, reduction is avoided if it would cause homophony problems with other verb forms, something that arises in Form II and Form V verbs. In the final section, I will demonstrate the preference for geminates over the CiVCi structure in other areas of the grammar.

4. Geminates vs. OCP in other forms

Independent evidence that Iraqi Arabic favors geminates over OCP violations in a CiVCi sequence comes from broken plurals and comparative adjectives.

Broken plurals formed with the prefix ?a- from singular CVCVVC nouns do not adopt a uniform shape in either Classical or Iraqi Arabic (Brame 1970, Erwin 1963). A plural formed from a regular noun takes the shape ?a-CCI? or ?a-CCI, ex. jihaaz 'appliance' --> ?ajhiza 'appliances'. But, if the final two consonants are identical in the singular, the broken plural has the shape ?a-CiCCaa or ?a-CiCCa with the 2nd consonant appearing to the right of the vowel [i] and not to the left, ex. janin 'fetus' and ?ajinna (not *?ajnina) 'fetuses'. The two identical consonants occur adjacent to one another as a geminate rather than separated by a vowel, as seen in (34c-d, g-h):

<table>
<thead>
<tr>
<th>Regular nouns</th>
<th>?a-CCI? or ?a-CCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doubled nouns</td>
<td>?a-CiCCaa or ?a-CiCCa</td>
</tr>
</tbody>
</table>

(34)

<table>
<thead>
<tr>
<th>singular</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. şadiiq</td>
<td>'friend'</td>
</tr>
<tr>
<td>b. qariib</td>
<td>'relative'</td>
</tr>
<tr>
<td>c. ṭabiib</td>
<td>'doctor'</td>
</tr>
<tr>
<td>d. daliil</td>
<td>'guide'</td>
</tr>
<tr>
<td>e. jihaaz</td>
<td>'appliance'</td>
</tr>
<tr>
<td>f. miθaal</td>
<td>'example'</td>
</tr>
<tr>
<td>g. janin</td>
<td>'fetus'</td>
</tr>
<tr>
<td>h. daliil</td>
<td>'evidence'</td>
</tr>
</tbody>
</table>

This pattern would be difficult to explain if OCP violations were preferred to gemination. It would also be problematic under a Tier Conflation analysis, which would have to resort to a different ordering between syncope/metathesis and Tier Conflation for nouns versus verbs.

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shape tCaCCa, ex. thadda 'he challenged'. The 3rd person feminine form is thaddat 'she challenged'. If Form V doubled verbs underwent syncope, they would neutralize with this shape: /traddad-at/ → *traddat 'she decided'. The source of the resulting geminate consonant is indeterminate. It is not clear if it corresponds to the medial geminate of Form V verbs or to a geminate derived from deletion of the vowel by fusing the final consonant with the medial geminate. Regular Form V verbs have no homophony problem, and syncope applies freely: txarraj-at --> txarj-at 'she graduated'.

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13
The same pattern is found with comparative adjectives (Erwin 1963:238). The normal pattern is \(a\)-CCVC unless the final two consonants of the adjective form are identical, either separated by a vowel (35d-e) or forming a geminate in the base form (35f-g). In either case, the shape is \(a\)-CVCC, ensuring a final geminate consonant in the comparative form (note that when a geminate is word-final in Iraqi it is pronounced as a singleton; if a vowel follows, it can be pronounced as a geminate).

(35)  
<table>
<thead>
<tr>
<th>adjective</th>
<th>comparative</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ?amiin 'trustworthy'</td>
<td>?a?man 'more trustworthy'</td>
</tr>
<tr>
<td>b. yaabis 'dry'</td>
<td>?aybas 'drier'</td>
</tr>
<tr>
<td>c. kaslaan 'lazy'</td>
<td>?aksal 'lazier'</td>
</tr>
<tr>
<td>d. jidiid 'new'</td>
<td>?ajadd 'newer'</td>
</tr>
<tr>
<td>e. qaliil 'few'</td>
<td>?aqall 'fewer'</td>
</tr>
<tr>
<td>f. haarr 'hot'</td>
<td>?aharr 'hotter'</td>
</tr>
<tr>
<td>g. murr 'bitter'</td>
<td>?amarr 'bitterer'</td>
</tr>
</tbody>
</table>

The data from broken plurals and comparative adjectives suggest that some templatic shapes may be undermined in order to avoid the sequence of identical consonants separated only by a vowel, a violation of the OCP. Instead, a geminate consonant is preferred, in line with the ranking of OCP > *GEM proposed for Arabic in general.

5. Conclusion

In this article, I have shown how Iraqi Arabic shares the ranking of \(\ast \bar{V} > \text{MAX}_{1,0}\) with Afar, but shares the ranking of OCP > *GEM with Classical Arabic. The resistance to syncope in Form III is not so much a resistance to gemination, but a resistance to creating non-moraic geminates or trimoraic syllables, which would be required to license CVVC syllables terminated by a geminate. The OT analysis presented here relies on general, well-motivated constraints as well as the violability of constraints, a crucial element missing from previous analyses of these data. Syncope resistance in Form II was analyzed as a general case of homphony avoidance which arises with doubled verbs, but not with regular verbs. Finally, the preference for geminates over OCP violations in Iraqi Arabic is supported from data from nouns and adjectives.
References


