Syllable structure and syllabification in Maaloula Aramaic

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1. INTRODUCTION

One of the intricate topics in the phonology of the Semitic languages is their syllabification and epenthesis processes. Much attention has been given to this topic in the different Arabic dialects (e.g. Broselow, 2017, 1992; Ito, 1989; Kiparsky, 2003; Selkirk, 1981; Watson, 2007, 2002). This topic, however, has received significantly less attention in the neighboring Neo-Aramaic dialects although they present similarly intricate problems.

Neo-Aramaic is the name given to all the varieties of Aramaic still spoken today. These varieties fall into four distinct groups: Western Neo-Aramaic, Central Neo-Aramaic, Eastern Neo-Aramaic (also called Northeastern Neo-Aramaic) and Neo-Mandaic (Heinrichs, 1990: x–xv). Western Neo-Aramaic, which is the variety described in this paper, is spoken in three Syrian villages located in the Qalamoun Mountains, namely Maaloula, Bakhaa (officially known as al-Sarkha) and Jubbaadin. Since our work primarily focuses on the dialect of Maaloula, the term ‘Maaloula Aramaic’ will be used throughout the paper to denote the Western Neo-Aramaic dialect of Maaloula. The geographical location of Maaloula with respect to the capital city, Damascus, is displayed in Map 1, and its location with respect to the other Aramaic-speaking villages, Jubbaadin and Bakhaa, is shown in Map 2.

Syllable structure and syllabification in Maaloula Aramaic are described in two reference grammars: Spitaler (1938) and Arnold (1990). Spitaler’s (1938: 44–46) treatment of the subject will not be reviewed because it is diachronic in nature. Arnold’s (1990: 37–40) synchronic account provides a good starting point and will therefore be reviewed in detail in the next section. As can be seen, the sources on the phonology of Maaloula Aramaic are scarce and language-specific, and the language itself is now considered endangered. Therefore, the need to understand these phonological processes from a broader comparative perspective has become increasingly important. The present study attempts to describe and analyze these processes from a cross-linguistic perspective which compares Maaloula Aramaic to the surrounding Arabic varieties.

We present the analysis in a rule-based format without commitment to potential theoretical underpinnings of a rule-based approach. An alternative approach is possible and feasible, using the stratal Optimality Theory model proposed and applied to Arabic by Kiparsky (2003). We will not engage in a comparison between the two approaches, as none of our main points hinges on the choice of framework.

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1 See Ethnologue’s entry for Western Neo-Aramaic (Eberhard et al., 2023) (accessed July 16, 2023, at https://www.ethnologue.com/language/amw/). According to Ethnologue, a language is considered endangered when “it is no longer the norm that children learn and use this language”.

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2. PREVIOUS ACCOUNTS

2.1. Syllable structure and syllabification

According to Arnold (1990: 37–38), the syllable inventory of Maaloula Aramaic contains the following syllable types which are presented here in three lines in order of decreasing frequency:

(1) Syllable inventory

<table>
<thead>
<tr>
<th>CV</th>
<th>CVC</th>
<th>CVCC</th>
<th>CVV</th>
<th>CVVC</th>
<th>CVVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCV</td>
<td>CCVC</td>
<td>CCVCC</td>
<td>CCVV</td>
<td>CCVVC</td>
<td>CCVVCC</td>
</tr>
<tr>
<td>CCCV</td>
<td>CCCVC</td>
<td>CCCVCC</td>
<td>CCCVV</td>
<td>CCCVVC</td>
<td>CCCVVCC</td>
</tr>
</tbody>
</table>

Arnold (1990: 39) proposes the following rule for the syllabification of word-medial consonant clusters in disyllabic and polysyllabic words.

(2) Syllabification of word-medial consonant clusters

The syllable boundary is placed between the two consonants in a two-consonant cluster (i.e. -C.C-), and after the second consonant in a three-consonant cluster (i.e. -CC.C-).

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All of these shapes will be illustrated in different examples in the paper, except for CCCVVCC which seems to be restricted to words which start with CCVVCC and are preceded by a one-consonant clitic (e.g., la-frisišxun `for your (masc pl.) right' (Arnold, 1990: 39)).
The following examples illustrate this rule\(^3\):

\[
\begin{array}{c|c|c}
\text{-C.C-} & \text{-CC.C-} \\
\hline
\text{tel.ka} & \text{‘snow’} & V.37^4 \\
\text{gbeč.ča} & \text{‘cheese’} & V.38 \\
\hline
\text{nošak.ča} & \text{‘kiss’} & V.37 \\
\text{frisč.xun} & \text{‘your (MASC PL) right’} & V.38 \\
\end{array}
\]

\(^3\) Throughout the paper, we adopt the transcription system used by Arnold (1991a, 1991b, 1990). Although this adopted system is meant to represent surface forms, the outputs of a few phonological processes are consistently absent from it. For example, the glottal stops that are inserted at the beginning of word-initial onsetless syllables are not represented (e.g. \(\text{iência ‘they arrived} \) rather than \(\text{imante}, \) and \(\text{išen} \) rather than \(\text{išen} \)), and the geminate consonants which undergo degemination in preconsonantal position are transcribed as geminates rather than singletons (e.g. \(\text{ašrūšen ‘you (FEM SG) left me} \) rather than \(\text{ašrūšan} \)). In this paper, we have adopted the original transcription system without modifying it, but we have provided the actual surface representations in square brackets whenever a more accurate representation is needed.

\(^4\) In order to cite the sources of the Aramaic examples, we use the Roman numbers (III, IV, V, and VI) to refer respectively to Arnold’s volumes (1991a, 1991b, 1990, and 2019). We have chosen these numbers following his original numbering (see references). The Arabic numbers refer to the page number. For example, V.132 refers to Arnold (1990: 132). The examples marked ‘FW’ (as, e.g., in (13)) are from our native language consultant. For the Arabic examples, we use normal citation because they are taken from different sources.
Arnold (1990: 39) also shows that syllabification applies not only within word boundaries, as in (3), but also across word boundaries, as in (4).

\[(4) \text{loğatla mšihā} \quad [\text{loğat-La:m.ši:ha}] \quad \text{‘the language of Christ’ \ V.39}\]

The principles which determine this syllabification, however, are not given. These principles would have to explain the tendency to have more consonants in the syllable coda than in the onset of the following syllable as the examples in (3) under -CC.C- show. In the absence of these principles, one can argue that an alternative syllabification, such as -CCC- or -C.CC- (e.g. frīs.čxun or frīs.čxun instead of frīsč.xun), is also plausible. This alternative syllabification might also have consequences for the syllable inventory shown in (1).

In section 3, we will propose a different syllabification approach which will significantly reduce the syllable types listed in (1).

2.2. Vowel epenthesis

In Maaloula Aramaic, an epenthetic vowel is inserted to break up a consonant cluster. Arnold's (2011: 686, 1990: 20, 40) main points on this topic can be summarized as follows:

- The epenthetic vowel does not have a phonemic status.
- The epenthetic vowel does not play any role in the syllabification process (i.e. it cannot be a syllable nucleus). For example, Arnold syllabifies the word nošɑ̄ktɑ̄ ‘kiss’ V.37 which contains the epenthetic vowel [a] as nošɑ̄ktɑ.
- In terms of vowel quality, Arnold (1990: 40) states rather vaguely that its realization can range between [e] and [i]. With regard to transcription, it is predominantly transcribed as [ə]. However, there are instances where it is variably transcribed as [ə] and [i] in Arnold's (1991a, 1991b) transcripts. This variable transcription is illustrated in (5). The epenthetic vowel is transcribed as [ə] in (5a) and as [i] in (5b). In these examples, the epenthetic vowel is inserted before the suffix -l which connects two nouns in the genitive construction (see Arnold, 1990: 301–302; Correll, 1978: 6).

\[(5) \quad \begin{align*}
(a) \quad mɔrɛl ɡamla & \quad \text{‘the owner of the camel’} & \quad \text{IV.230} \\
makɔmɛl berɑktɑ & \quad \text{‘the shrine of Saint Thecla’} & \quad \text{IV.222} \\
bnoṭl bɔnax & \quad \text{‘the daughters of your brother’} & \quad \text{IV.68} \\
mɔrɔyal ɡemsk & \quad \text{‘the people of Damascus’} & \quad \text{IV.228} \\
fɔyɛl ɛfɛl & \quad \text{‘the child’s face’} & \quad \text{III.198} \\
(b) \quad pɑytɑ ɡɑbɾɔnɑ & \quad \text{‘the man’s house’} & \quad \text{IV.8} \\
yarhli iyyar & \quad \text{‘the month of May’} & \quad \text{III.162} \\
bercǐl malka & \quad \text{‘the king’s daughter’} & \quad \text{IV.184} \\
aξɛɾcǐl yarhɑ & \quad \text{‘the end of the month’} & \quad \text{III.162} \\
rayʃl ʃarkǔbɑ & \quad \text{‘the top of the mountain’} & \quad \text{IV.10} 
\end{align*}\]

Arnold (1990: 40) presents an algorithm which indicates the place of vowel epenthesis in Maaloula Aramaic:

\[(6) \quad \begin{align*}
(a) \quad \text{Count the consonants in a consonant cluster from right to left.} \\
(b) \quad \text{Insert an epenthetic vowel after every second consonant.} \\
(c) \quad \text{In the case of two word-final consonants, the right word boundary is counted as a consonant.}
\end{align*}\]

\[\text{5 However, we do not know whether this variation reflects the actual pronunciation of these vowels, or whether it is based on transcription conventions rather than auditory facts. In any case, this variation does not fall within the scope of our paper. Future research can investigate the acoustic quality of the epenthetic vowel and verify whether this variation truly exists.} \]
This algorithm works word-internally and across word boundaries as can be seen from the examples in (7). For the sake of clarity, we underline the epenthetic vowels throughout the paper.

(7) (a) -CgC# itar 'two (MASC)' V.40
    xutap 'write (2 MASC SG) me!' III.374
(b) -CgCC- taxalta 'a passageway' V.40
    šabakta 'net' IV.58
(c) -CgCC- sōblā blōta 'the mayor of the village' V.40
(d) -CgCCgCC- logalta mšīha 'the language of Christ' V.40

This algorithm can be expressed as a phonological rule:

(8) **Vowel epenthesis in Maaloula Aramaic**

    \[ \emptyset \rightarrow a /C...C\{\# \}C \]

Although this rule predicts accurately where the epenthetic vowel is expected to occur, it leaves a number of unanswered questions which we will deal with individually in the next section.

2.3. Open questions

First, what do the two environments CCC and CC# have in common where epenthesis occurs? A number of phonologists (e.g. Blevins, 1995: 209; Hayes, 2009: 259, 264; Kahn, 1976: 23) have expressed their dissatisfaction with environments such as /C__C{#, C} because word boundaries (#) do not form a natural class with consonants (C).

Second, how can this rule be explained from a perspective which takes syllable structure into account? According to the epenthesis algorithm in (6), the insertion of the epenthetic vowel does not seem to be governed or affected by syllable structure. The following examples show that epenthesis can occur in onsets (9a) as well as codas (9b) if Arnold’s syllabification scheme (explained in (2)) is applied.

(9) (a) be-spāč.ta 'with a finger' V.39
    nošāk.ta 'kiss' V.37

Third, in Arnold’s words, this epenthetic vowel is “functionally non-syllabic” (2011: 686), which can be interpreted as not being able to form a syllable nucleus. For example, this can be seen in the word nošākta ‘kiss’ in (9b), which Arnold considers disyllabic [nošāk.ta], rather than trisyllabic [no.Šāk.ta], although it has the three potential nuclei [o], [ə], and [a]. This tendency to disregard the epenthetic schwa in syllabification is most probably due to the problem of syllable-stress interaction.

In Maaloula Aramaic, word stress falls on the final CVVC(C₀) or CVCC syllable. Otherwise, it falls on the penultimate syllable (Arnold, 1990: 40; Bergsträsser, 1915: xxi; Spitaler, 1938: 46). The epenthetic schwa seems to be considered non-syllabic because it is not visible to stress (see Bergsträsser, 1915: xix). For example, if, contrary to Arnold’s syllabification, the epenthetic vowel in nošākta were considered syllabic (i.e. [no.Šāk.ta]), then the penultimate syllable [Šāk], would receive stress (see (10a)). Since in nošākta the first syllable receives stress, this would not be the right analysis. Arnold’s syllabification avoids the problem posed by this opaque interaction between the epenthetic vowel and stress. By disregarding the epenthetic vowel, [nošāk] would be considered the penultimate syllable that duly receives stress (see (10b)). However, such a solution which considers a sequence like [nošēk] as monosyllabic, rather than disyllabic, is not fully convincing either. An account is needed which can generate a syllabification such as ['no.Šāk.ta] where [Šēk], is a syllable that does not interact with stress (see (10c)):
Fourth, why does Maaloula Aramaic seem to tolerate certain word-initial and word-medial CCC clusters where epenthesis is surprisingly ruled out? In the following examples, vowel epenthesis is not possible, contra Arnold’s algorithm:

(11) (a) word-initial CCC clusters (i.e. #CCC-)
    sōfī.tīᶜ (and not *sōfī.tīᶜ) ‘you (MASC SG) benefitted’ V.39
    sōfet (and not *sōfet) ‘benefit!’ V.39
(b) word-medial CCC clusters (i.e. -CCC-)
    sūsā.xen (and not *sūsā.xen) ‘your (FEM PL) horse’ V.38
    frīsā.xun (and not *frīsā.xun) ‘your (MASC PL) right’ V.38

If the epenthesis algorithm presented in (6) applies to all CCC clusters, then why does it not apply to these cases? If these are exceptional cases, are there other exceptions, and is there anything in common among them? In order to answer these questions, we will present an alternative syllabification scheme which accounts for epenthesis from a syllable-based perspective.

Before doing so, a word on the variation in the application of vowel epenthesis and on the phonological status of this vowel is in order. It seems that vowel epenthesis is obligatory in some environments and optional in other environments. For example, the same words in (12) are attested with and without the epenthetic vowel although in all these words the conditions for vowel epenthesis are met.

(12) variant with no epenthetic vowel variant with an epenthetic vowel
    berkʹta III.182 ~ berakʹta III.180 ‘Saint Thecla’
    aktriṭ III.48 ~ akgrīṭ III.56 ‘I was able (to)’
    lofṭa III.164 ~ lofāṭa IV.16 ‘game; toy’
    mofčha7 IV.56 ~ mofāṭa IV.70 ‘key’
    tārīc IV.64 ~ tārīẓ III.104 ‘two (FEM)’
    imt III.172 ~ mofčha IV.116 ‘he/they arrived’

In addition to the words above, which can appear with and without the epenthetic vowel, there are words that are always attested with an epenthetic vowel. For example, there are a total of 58 tokens of the word type išan ‘years (ENUM PL)’ in III and IV. In all these instances, išan appears epenthesized. We are using the term ‘optionality’ to refer to all these cases where epenthesis can apply. Optionality does not refer to the cases in which epenthesis cannot apply, such as in the words sōfītić (*sgōfītić) and frīsāxun (*frīsāxun) in (11).

We do not know the reasons for the optionality in the application of epenthesis. The literature on Maaloula Aramaic makes no reference to it. However, a number of studies on the surrounding Arabic dialects have shown that optionality may be dependent on sonority. Hall (2011: 1576), for example, generalizes that “epenthesis [in Lebanese Arabic] is more or less obligatory in coda clusters of an obstruent followed by a sonorant […], and optional in most other clusters”. Optionality might also be attributed to other factors. For example, Watson (2007: 345) argues that the epenthesized and non-epenthesized word forms in Libyan Tripoli Arabic “may well be stylistic variants”.

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7 It appears as mufčha rather than mofčha in the original text, but our language consultant dismisses mufčha as incorrect.
Throughout the paper, whenever we refer to vowel epenthesis, we mean the cases where epenthesis can (or, in some cases, must) apply. The cases where epenthesis cannot apply, even if there is a consonant cluster, are dealt with in section 4.2.

With regard to the phonological status of this vowel, we have considered it to be an epenthetic vowel although two alternative analyses may seem plausible at first sight. The first analysis would be to consider this vowel a lexical (or underlying) vowel that undergoes deletion in a set of words. In order to compare the deletion analysis with the epenthesis analysis, we present two data sets, one in (13) and one in (14). In each data set, the surface forms are accounted for first by the epenthesis analysis and then by the deletion analysis.

The first data set, shown in (13), presents $\emptyset \sim a$ alternations in pairs of words. Each pair represents the singular and plural forms of the same lexeme. This is why they have the same base. Analysis (13a) represents the epenthesis option, and analysis (13b) represents the deletion option. Analysis (13a) is more plausible because it assumes that a vowel is inserted to break up a CCC cluster, which is a marked structure cross-linguistically. In the word forms which do not have consonant clusters, epenthesis does not apply. By contrast, analysis (13b) is less convincing because the application of vowel deletion to some word forms (but not to other word forms) does not seem to be phonologically motivated (i.e., it does not repair an illicit structure of any type).

(13) First data set: Two competing analyses to account for the same surface forms

(a) [a] Epenthesis analysis
/samk-T-a/ $^8$ $\rightarrow$ [sam$k\partial$] ‘fish (sg)’ III.278 (epenthesis applies)
/samk-ő-T-a/ $^9$ $\rightarrow$ [sam$k\partial$] ‘fish (pl)’ IV.140
/šabk-T-a/ $\rightarrow$ [šab$k\partial$] ‘net’ IV.58 (epenthesis applies)
/šabk-ő-T-a/ $^{10}$ $\rightarrow$ [šap$k\partial$] ‘nets’ FW

(b) /a/ Deletion analysis
/samk-T-a/ $\rightarrow$ [sam$k\partial$] ‘fish (sg)’ III.278
/samk-ő-T-a/ $\rightarrow$ [sam$k\partial$] ‘fish (pl)’ IV.140 (deletion applies)
/šabk-T-a/ $\rightarrow$ [šab$k\partial$] ‘net’ IV.58
/šabk-ő-T-a/ $\rightarrow$ [šap$k\partial$] ‘nets’ FW (deletion applies)

The second data set, shown in (14), presents variation in the position of [a] with respect to the suffix -$l$. The vowel [a] occurs before-$l$ in some examples and after it in other examples. In each of the examples presented in (14), two nouns are connected in the genitive construction by the suffix -$l$ (for the genitive construction in Maaloula Aramaic, see Arnold, 1990: 301–302; Correll, 1978: 6). Analysis (14a) proposes that in each example there is an underlying consonant cluster across word boundaries (i.e., CCC and CCC), and [a] is epenthized to break up that cluster. The noticeable variation in the position of the epenthetic vowel is dependent on the cluster (i.e., CC$C$CC and C$C$CC), regardless of the position of the suffix -$l$. This is why the same underlying structure /mòr-l/ ‘owner of’ surfaces as [mòra] if the cluster is CCC and as [mòrel] if the cluster is CCC (the same can be said about /ṣêl-l/ ‘feast of’).

Analysis (14b) proposes that there are two underlying schwas, one before and one after the suffix -$l$, and that one of them is deleted. This analysis has to be ruled out because it does not explain why only one schwa is deleted and one is left, and why the first schwa is deleted in some examples and the second is deleted in other examples.

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$^8$ /T/ indicates the {FEMININE MARKER} morpheme that we intend to leave unspecified in underlying representations. At the surface level, this morpheme has the two allomorphs [t] and [j].

$^9$ Many of the presented examples which have /a/ in their underlying representations should actually be transcribed with /i/ instead of /a/ (e.g., /sam-k-a-T-a/). This /a/ is realized as [o] through a process which is not related to syllabification or vowel epenthesis. To avoid this irrelevant complication, we transcribed the underlying forms with /o/ rather than /a/ in these examples.

$^{10}$ The underlying /b/ undergoes devoicing and surfaces as [p] because it occurs before a voiceless consonant.
intrusive vowels and it is inserted optionally. However, it di
sive vowels. The Maaloula Aramaic vowel in question has two of the properties of intrusive vowels. Its quality is schwa, (Hall, 2006: 387). To determine whether this vowel is intrusive or not, we will useHall’s (2006: 391) diagnostics for intru-

Based on the discussion above, the deletion analysis has to be rejected.

The second alternative analysis would be to consider the Maaloula Aramaic schwa an intrusive (or excrecent) vowel, rather than an epenthetic vowel. Intrusive vowels “are actually phonetic transitions between consonants” (Hall, 2006: 387). To determine whether this vowel is intrusive or not, we will use Hall’s (2006: 391) diagnostics for intrusive vowels. The Maaloula Aramaic vowel in question has two of the properties of intrusive vowels. Its quality is schwa, and it is inserted optionally. However, it differs from intrusive vowels in two important aspects.

First, whereas an intrusive vowel “generally occurs in heterorganic clusters” (Hall, 2006: 391), the Maaloula Aramaic schwa occurs freely in homorganic clusters. In the examples in (16), the vowel [a] occurs between alveolar consonants.

Second, whereas the intrusive vowel “does not seem to have the function of repairing illicit structures” (Hall, 2006: 391), the Maaloula Aramaic schwa clearly has the function of repairing illicit or marked structures, such as consonant clusters. Notice that in the examples in (13) and (14) above, the schwa is inserted only when a consonant cluster is formed. This ability to repair a marked structure is a property of epenthetic (rather than intrusive) vowels, according to Hall (2006: 391). Based on these diagnostics, the intrusive (or excrecent) vowel analysis has to be ruled out.

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11 It is transcribed as kamsyọta in the original text.
3. SYLLABLE-BASED ANALYSIS

In this section, we put forward an alternative syllable inventory that differs completely from the one presented by Arnold (in section 2.1). We propose that Maaloula Aramaic allows only three syllable types: CV, CVV, and CVC. This proposal is inspired by the classification of syllable types in the Arabic dialects (Kiparsky, 2003; Watson, 2002).

The various Arabic dialects can be said to fall into three major groups primarily based on the position of the epenthetic vowel in a word-medial C1C2C3 cluster. Adopting Kiparsky’s (2003) terminology, we can refer to these groups as VC-dialects, CV-dialects, and C-dialects.12 We use the oft-cited example ‘I/you (MASC SG) said to him’ to show the position of the epenthetic vowel in each of these groups (see, e.g., Broselow, 1992: 23–24; Itô, 1989: 241–251; Kiparsky, 2003: 150; Selkirk, 1981: 228–231). VC-dialects, such as Iraqi Arabic, epenthesize the vowel to the left of C2 (i.e. C1VC2C3) (e.g. gīltīlā). CV-dialects, such as Cairene Arabic, epenthesize the vowel to the right of C2 (i.e. C1C2VC3) (e.g. ㄕulīlu). C-dialects, such as Moroccan Arabic, tolerate CCC sequences (e.g. qəltlu). The difference between these dialect groups is schematized in (17).

(17) Vowel epenthesis in a CCC cluster in different Arabic dialect groups

<table>
<thead>
<tr>
<th>VC-dialects</th>
<th>CV-dialects</th>
<th>C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(e.g. Iraqi)</td>
<td>(e.g. Cairene)</td>
<td>(e.g. Moroccan)</td>
</tr>
<tr>
<td>/gīl-t-ī-l-a/</td>
<td>/qul-t-ī-l-u/</td>
<td>/qol-t-ī-l-u/</td>
</tr>
<tr>
<td>C1VC2C3</td>
<td>C1C2VC3</td>
<td>C1C2C3</td>
</tr>
<tr>
<td>[gīl ∥ t ∥ ī ∥ lā]</td>
<td>[qul ∥ t ∥ ī ∥ lu]</td>
<td>[qol ∥ t ∥ lu]</td>
</tr>
</tbody>
</table>

In addition to the difference in the position of the epenthetic vowel in a CCC cluster, these three Arabic dialect groups differ in a number of other properties pointed out in Kiparsky (2003: 149–150) (see also Watson, 2007). These properties include (among other things not directly related to our research questions) the tolerance of phrase-final CC clusters, phrase-initial onset CC clusters, word-initial geminates, and non-final CVVC syllables as well as the interaction between epenthesis and stress. These properties are summarized in (18).

(18) Some properties of the Arabic dialect groups (based on Kiparsky, 2003: 149–150)

<table>
<thead>
<tr>
<th>Phrase-final CC</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>not permitted/</td>
<td>permitted</td>
<td>permitted</td>
</tr>
<tr>
<td></td>
<td>permitted (only with falling sonority)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phrase-initial CC</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>permitted (but may be broken up by a prosthetic vowel)</td>
<td>not permitted</td>
<td>permitted</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial geminates</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>permitted (but may be broken up by a prosthetic vowel)</td>
<td>not permitted</td>
<td>permitted</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-final CVVC</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>permitted</td>
<td>shortened</td>
<td>permitted</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Epenthesis/stress interaction</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>opaque</td>
<td>not opaque</td>
<td>no epenthesis</td>
<td></td>
</tr>
</tbody>
</table>

The model of classification of Arabic dialects can be applied to other Semitic languages, such as Aramaic. The analysis presented in this paper will reveal that Maaloula Aramaic shows features of both VC- and C-dialects (see section 3.7).

Following Kiparsky (2003, 1982), we argue that the phonological processes apply on two distinct levels: the lexical level and the postlexical level. We assume that, like in other languages such as Greek or Latin (e.g. Nespor and Vogel, 1980),

12 However, this is not the only available typology. Watson (2007) identified a fourth group which displays mixed epenthesis patterns (e.g. Central Urban Sudanese). She named this group CV-dialects. Lindsay-Smith (2021) presented a different phonological typology, incorporating the variation across the Arabic dialects into two axes, namely TOLERANCE and REPAIR. TOLERANCE refers to the type of syllables that these dialects tolerate, and REPAIR refers to how these dialects deal with violations of syllable structure.
Arnold’s (2019) Aramaic-German dictionary. This aim was achieved with the help of a native language consultant.\textsuperscript{14} Due to these reasons, we decided to supply each word form with its lemma and root as they appear in a dictionary. However, these types are word forms rather than lexemes. Many of them are the result of inflection, derivation, and affixation. Sometimes the same word form appears in different orthographic representations. This is usually due to a phonological process that can be used to illustrate the different behavior of words versus clitic groups. Words starting with a CCC cluster (#CCC) differ from clitic groups which start with the same cluster (C#CC), as shown in (18c). While we see epenthesis within the CCC cluster in the clitic group, epenthesis is ruled out within the word. This will be discussed in more detail in section 4.2.1.

\[
\begin{array}{lll}
(a) & \text{tareq} & \text{‘two (FEM)’} \\
(b) & \text{tabakta} & \text{‘dabke (a folk dance)’} \\
(c) & \text{gabar} & \text{‘men’} \\
(d) & \text{masapha} & \text{‘she looks like you (FEM)’} \\
(e) & \text{ba-spaf} & \text{‘with a finger’} \\
(f) & \text{gagro} & \text{‘until the evening’} \\
\end{array}
\]

The postlexical level is where processes apply across word boundaries, within the phonological phrase. We argue that in Maaloula Aramaic, syllabification and stress assignment take place at the lexical level, whereas vowel epenthesis and resyllabification apply at the postlexical level. Put differently, we show that syllabification applies cyclically, and that epenthesis takes place between two syllabification cycles.

3.1. Data and method

In order to test our syllabification scheme empirically on as many words as possible, we compiled a word list from two sources (Arnold, 1991a, 1991b) which contain the transcriptions of tape-recorded narratives that Werner Arnold collected during his field research in Maaloula between 1985 and 1987.\textsuperscript{13} The word list consists of more than 12,000 types. However, these types are word forms rather than lexemes. Many of them are the result of inflectional and derivational affixation. Sometimes the same word form appears in different orthographic representations. This is usually due to affix allomorphy. Due to these reasons, we decided to supply each word form with its lemma and root as they appear in Arnold’s (2019) Aramaic-German dictionary. This aim was achieved with the help of a native language consultant.\textsuperscript{14}

Using a spreadsheet (like the one shown in (20)), we syllabified all the word list types according to the predefined syllables: CV, CVC and CVV. The syllabification column represents syllabification at the lexical level, so if a word contains a schwa in its surface representation, this epenthetic vowel is ignored and not represented by a V.

\[
\begin{array}{llll}
\text{Root} & \text{Lemma} & \text{Word form} & \text{Syllabification} \\
\hline
\text{gwd} & \text{goda} & \text{gad} & \text{#CV.CVV#} \\
\text{gwd} & \text{goda} & \text{gadye} & \text{#CV.CVV.CV#} \\
\text{gth} & \text{gahkon} & \text{gahkon} & \text{#CV.CV.CV.CV#} \\
\text{ghb} & \text{gabha} & \text{gabha} & \text{#CVC.CV#} \\
\text{ghb} & \text{gahba} & \text{gahbo} & \text{#CVC.CVV#} \\
\end{array}
\]

\textsuperscript{13} A digitized version of Arnold’s transcriptions and the word list (“MASC_dataframe.csv”) are available as part of the Maaloula Aramaic Speech Corpus (MASC) (Eid et al., 2022b) at https://doi.org/10.5281/zenodo.6496714. For more details, see Eid et al. (2022a).

\textsuperscript{14} Our native language consultant is a 37-year-old male who is bilingual in Maaloula Aramaic and Arabic, and also speaks English. He lived in Syria until 2018 and in Lebanon between 2018 and 2020, and has lived in Canada since 2020. He has a bachelor’s degree in biology from Damascus University, and he worked as a biology teacher in Maaloula’s High School before leaving his homeland. He also taught Maaloula Aramaic at the Aramaic Language Center in Maaloula and at the Higher Language Institute at Damascus University. He designed and published a textbook (Rihan, 2017) for the courses which he taught.
In addition to this word list, we conducted several elicitation sessions with the native speaker consultant.\(^{15}\)

### 3.2. Syllable weight

Like in Arabic, the weight of a syllable in Maaloula Aramaic plays an important role in determining the position of stress. The unit of syllable weight that we use is the mora (represented by \(\mu\)). We adopt Hayes’s (1989) version of moraic theory, according to which CV is considered a light syllable: its short vowel receives one mora (21a). CVV is heavy: its long vowel receives two moras (21b). CVC is heavy in a non-final position: its vowel receives one mora, and its coda consonant receives one mora through Weight-by-Position (21c). The Weight-by-Position rule is language-specific whereby CVC syllables are heavy in some languages and light in other languages (Hayes, 1989: 258). In word-final position, however, we follow Hayes (1995: 125) in assuming that CVC is light (21d). The reason for this assumption is that word-final CVC syllables would attract stress if phonologically heavy, which they don’t (see section 3.5 for details on stress assignment).\(^{16}\)

(21) (a) (b) (c) (d)

These three syllable types are shown in the two disyllabic words in (22). The word in (22b) consists of two CVC syllables, the first of which is heavy through Weight-by-Position while the second syllable is light because it is word-final. Throughout this paper, we mark morpheme boundaries with hyphens in the underlying representations.

(22) (a) (b)

\[/\text{núr-\text{a}/}\rightarrow ['\text{nú}\text{.ra}] \text{‘fire’ III.80} \quad /\text{pay\text{-a}/h/}\rightarrow ['\text{pay.\text{a}/h}] \text{‘our home’ III.60}\]

\(^{15}\) These elicitation sessions were held online because the authors are based in Germany and the native speaker consultant lives in Canada. In addition to these sessions, the first author and the native speaker consultant exchanged different forms of messages such as text, picture, and voice messages. These sessions and messages had the aim of generating inflectional forms which were not attested in Arnold’s texts (see, e.g., the inflectional forms in Section 4.2.2) and of verifying whether the consultant will consider the variant with an epenthetic vowel to be acceptable or not.

\(^{16}\) Hayes (1995: 125–129) assumes that word-final consonants are extrametrical in Palestinian Arabic. As a result of this consonant extrametricality, the coda consonant in a word-final CVC syllable is not assigned a mora. This renders word-final CVC syllables monomoraic or light.
3.3. Syllabification

Syllables in Maaloula Aramaic are formed according to the syllabification scheme in (23) which borrows elements from a number of interrelated analyses including Kahn (1976: 37–38), Clements (1990: 299), and Watson (2002: 63).

(23) Syllabification scheme
(a) Nucleus formation: Associate each [+syllabic] segment to a syllable node.
(b) Onset formation: Given P (an unsyllabified segment) preceding Q (a nucleus), adjoin P to the syllable containing Q.
(c) Coda formation: Given Q (a nucleus) followed by R (an unsyllabified segment), adjoin R to the syllable containing Q if Q is monomoraic.

The coda formation process (23c) is conditional in order to allow the formation of CVC syllables but block the formation of CVVC syllables.

These three steps are illustrated in the syllabification of the two words *nūra* and *payṭah* already introduced in (22):

(24) Syllabification scheme exemplified
/nūr-a/ → [nū.ra] ‘fire’ III.80
/payṭ-aḥ/ → [payṭ.aḥ] ‘our home’ III.60

(a) Nucleus formation

(b) Onset formation

(c) Coda formation

3.4. Stray consonants

When the syllabification scheme applies, some consonants remain unsyllabified. As they are not part of syllables, they are called ‘stray consonants’ (e.g. Archangeli, 1991; Broselow, 1992; Itô, 1989; Selkirk, 1981). In Maaloula Aramaic, individual stray consonants are tolerated at the lexical level. Our data shows that these stray consonants can occur word-initially, word-medially, and word-finally as can be seen in (25). The stray consonants are given in angled brackets:
(25) **Stray consonants resulting from the application of the syllabification scheme**

(a) **Word-initial stray consonants**
underlying forms | lexical level | IV.36
---|---|---
/s̞t̞œb-a/ → [s̞.t̞.o.b.a] | ‘book’ | IV.36
/s̞s̞or-fr-a/ → [s̞.s̞.o.f.r.a] | ‘morning’ | IV.256
/blo̞t-a/ → [b.l.o.t.a] | ‘village’ | IV.12
/mš̞i̞-a/ → [mš̞i̞.ha] | ‘Christ’ | III.154
/xš̞ur-a/ → [xš̞.u.ra] | ‘wood’ | IV.334

(b) **Word-medial stray consonants**
underlying forms | lexical level | V.37
---|---|---
/noš̞-T-a/ → [nो.s̞.h].t.a | ‘kiss’ | V.37
/berk-T-a/ → [bɛrk.h].t.a | ‘Saint Thecla’ | III.180
/ɡabm-o/ → [ɡab.h].nɔ | ‘men’ | III.364
/ho̞l-T-a/ → [ho̞l.l].č.a | ‘maternal aunt; stepmother’ | IV.166
/kö̞dy-a/ → [kö̞.d].ya | ‘judge’ | IV.146

(c) **Word-final stray consonants**
underlying forms | lexical level | III.274
---|---|---
/tarč/ → [t.ar.č] | ‘two (FEM)’ | III.274
/lsir/ → [l.ʃs.l].ɾ | ‘twenty’ | III.304
/yarh/ → [yar.h] | ‘months (ENUM PL)’ | IV.142
/mon/ → [m.ɔn] | ‘who’ | IV.296
/loid/ → [loid] | ‘if’ | III.120

(d) **Stray consonants in more than one position**
underlying forms | lexical level | IV.214
---|---|---
/s̞c̞afkte/ → [s̞c̞af.č.te] | ‘he checked up on him’ | IV.214
/klesi-ya/ → [k.ʃe.ʃ.ya] | ‘church’ | III.166
/tl̞et/ → [tl̞.ɛ.ʃ] | ‘thirty’ | IV.262

In terms of moraic analysis, we follow Kiparsky (2003) in assuming that a stray consonant is associated with one mora which is adjoined not to a syllable node but to the node of a higher phonological domain (usually the phonological word). This assumption is exemplified in the syllabification of four words (taken from (25)) in which the stray consonants occur in word-initial, word-medial, and word-final positions:

---

17 Kiparsky refers to the consonants directly adjoined to the word node as *semisyllables*. However, we will keep referring to them as *stray consonants* throughout the paper.
Syllabification scheme: stray consonants involved

(a) Nucleus formation

(b) Onset formation

(c) Coda formation: the remaining segments are stray consonants

(d) Association of stray consonants to word nodes

3.5. Vowel epenthesis and resyllabification

Inspired by Kiparsky's (2003: 156–157) analysis, we propose the following account of vowel epenthesis in Maaloula Aramaic. Vowel epenthesis

(a) occurs between a syllabified consonant and a following stray consonant,
(b) is a postlexical process,
(c) and occurs within and across word boundaries.

(a) Vowel epenthesis occurs between a syllabified consonant and a following stray consonant. We saw in section 3.4 that some consonants remain extrasyllabic or stray. At the postlexical level, an epenthetic [ə] is inserted between a syllabified consonant (represented by $C_r$) and a following stray consonant (represented by $C'$). In (27), we show the difference between the rule based on consonant counting ((27a) originally introduced in (8)) and the alternative rule based on syllable structure (27b) (for a similar evaluation of Yawelmani epenthesis rules see Hayes, 2009: 264–266).
(27) Vowel epenthesis in Maaloula Aramaic

(a) Consonant-based rule: $\emptyset \rightarrow \text{o} / \text{C} / \text{C}^{\#}$

(b) Syllable-based rule: $\emptyset \rightarrow \text{o} / \text{C} _{\text{sc}} / \text{C}'$

Rule (27b) has many advantages over (27a), one of which is that it answers the question of what the two environments CCC and CC# have in common (the first question in section 2.3). Rule (27b) does not consider word-boundaries and focuses instead on the syllable boundary and the stray consonants remaining outside it. This also means that (27b) provides an adequate answer to the second question, which problematized the role of the syllable in the epenthesis process.

Vowel epenthesis triggers a resyllabification process in which the coda of the previous syllable becomes the onset of a new syllable whose nucleus is the epenthetic vowel and whose coda is the stray consonant. In (28), we show how epenthesis and resyllabification apply, using the same examples from (25). It can be noticed that in many words in (28) (e.g. (28a)) epenthesis does not apply even when there is a stray consonant in the word. This is because the existence of a stray consonant is not the only component of the environment $\text{C}_{\text{sc}} / \text{C}'$. For epenthesis to take place, the stray consonant has to be preceded by a syllabified consonant.

(28) Epenthesis and resyllabification in the environment $\text{C}_{\text{sc}} / \text{C}'$

(a) Word-initial stray consonants

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical level</th>
<th>postlexical level</th>
</tr>
</thead>
<tbody>
<tr>
<td>/\text{xṭōb-a}/</td>
<td>[\text{x}.\text{ṭ}.\text{b}a]</td>
<td>[\text{x}.\text{ṭ}.\text{b}a]</td>
</tr>
<tr>
<td>/\text{ṣōf-ra}/</td>
<td>[\text{ṣ}.\text{ṣōf-ra}]</td>
<td>[\text{ṣ}.\text{ṣōf-ra}]</td>
</tr>
<tr>
<td>/\text{blō-ta}/</td>
<td>[\text{b}.\text{lō.ta}]</td>
<td>[\text{b}.\text{lō.ta}]</td>
</tr>
<tr>
<td>/\text{mṣīh-ya}/</td>
<td>[\text{m}.\text{ṣī.ha}]</td>
<td>[\text{m}.\text{ṣī.ha}]</td>
</tr>
<tr>
<td>/\text{xṣūr-ya}/</td>
<td>[\text{x}.\text{ṣū.ra}]</td>
<td>[\text{x}.\text{ṣū.ra}]</td>
</tr>
</tbody>
</table>

(b) Word-medial stray consonants

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical level</th>
<th>postlexical level</th>
</tr>
</thead>
<tbody>
<tr>
<td>/\text{nōšk-T-a}/</td>
<td>[\text{ṇoşk}_.\text{t}a]</td>
<td>[\text{ṇoşk}_.\text{t}a]</td>
</tr>
<tr>
<td>/\text{berk-T-a}/</td>
<td>[\text{bèrk}_.\text{t}a]</td>
<td>[\text{bèrk}_.\text{t}a]</td>
</tr>
<tr>
<td>/\text{gābrn-ō}/</td>
<td>[\text{gābrn}_.\text{n}o]</td>
<td>[\text{gābrn}_.\text{n}o]</td>
</tr>
<tr>
<td>/\text{hōl-T-ā}/</td>
<td>[\text{hōl}_.\text{ṭ}a]</td>
<td>[\text{hōl}_.\text{ṭ}a]</td>
</tr>
<tr>
<td>/\text{kōdy-ā}/</td>
<td>[\text{kōd}_.\text{ṭ}a]</td>
<td>[\text{kōd}_.\text{ṭ}a]</td>
</tr>
</tbody>
</table>

(c) Word-final stray consonants

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical level</th>
<th>postlexical level</th>
</tr>
</thead>
<tbody>
<tr>
<td>/\text{ṭar-č}/</td>
<td>[\text{ṭar}_.\text{č}]</td>
<td>[\text{ṭar}_.\text{č}]</td>
</tr>
<tr>
<td>/\text{ṣīs-/}/</td>
<td>[\text{ṣīs}_.\text{r}i]</td>
<td>[\text{ṣīs}_.\text{r}i]</td>
</tr>
<tr>
<td>/\text{yar-ḥ}/</td>
<td>[\text{yar}_.\text{ḥ}i]</td>
<td>[\text{yar}_.\text{ḥ}i]</td>
</tr>
<tr>
<td>/\text{mō/}/</td>
<td>[\text{mō}_.\text{n}i]</td>
<td>[\text{mō}_.\text{n}i]</td>
</tr>
<tr>
<td>/\text{lō/}/</td>
<td>[\text{lō}_.\text{n}i]</td>
<td>[\text{lō}_.\text{n}i]</td>
</tr>
</tbody>
</table>

(d) Stray consonants in more than one position

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical level</th>
<th>postlexical level</th>
</tr>
</thead>
<tbody>
<tr>
<td>/\text{sṣaft-s/}/</td>
<td>[\text{s}.\text{ṣaf}_.\text{ṭ}a]</td>
<td>[\text{s}.\text{ṣaf}_.\text{ṭ}a]</td>
</tr>
<tr>
<td>/\text{kūs-s/}/</td>
<td>[\text{k}.\text{ūs}_.\text{s}a]</td>
<td>[\text{k}.\text{ūs}_.\text{s}a]</td>
</tr>
<tr>
<td>/\text{lēt/}/</td>
<td>[\text{ḷ}.\text{ṭe}_.\text{t}]</td>
<td>[\text{ḷ}.\text{ṭe}_.\text{t}]</td>
</tr>
</tbody>
</table>
The account of epenthesis we propose is illustrated in (29) by showing the resyllabification of the same four words whose lexical syllabification has been shown in (26). In these words, the stray consonants occur in word-initial, word-medial, and word-final positions:

(29) Epenthesis and resyllabification illustrated

(a) Input (lexical level)

(b) Vowel epenthesis

(c) Resyllabification

(d) Output (postlexical level)
(b) Vowel epenthesis is a postlexical process.

The assumption that syllabification and stress assignment are lexical processes while epenthesis and resyllabification are postlexical processes solves the problem posed by the opaque relation between epenthesis and stress (the third question in section 2.3). The postlexically formed syllables, whose nuclei are the epenthetic vowel [ə], are not visible to stress because stress assignment applies earlier, taking only the available lexical syllables into account. In (30), for example, the postlexical syllable [šək], is formed too late to interact with stress.

(30) /noš-T-a/ 'kiss' V.37

<table>
<thead>
<tr>
<th>Syllabification: [noš.(k).ta]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress Assignment: [noš.(k).ta]</td>
</tr>
<tr>
<td>Lexical Output: [noša.(k).ta]</td>
</tr>
<tr>
<td>Epenthesis: [no.šək.ta]</td>
</tr>
<tr>
<td>Resyllabification: [no.šək.ta]</td>
</tr>
<tr>
<td>Postlexical Output: [no.šək.ta]</td>
</tr>
</tbody>
</table>

If epenthesis and resyllabification were to apply lexically (as in (31)), then the penultimate syllable [šək], would be eligible for stress, and the resulting word would be *[no.šək.ta].

(31) /noš-T-a/ 'kiss' V.37

<table>
<thead>
<tr>
<th>Syllabification: [noš.(k).ta]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epenthesis: [no.šək.ta]</td>
</tr>
<tr>
<td>Resyllabification: [no.šək.ta]</td>
</tr>
<tr>
<td>Stress Assignment: [no.šək.ta]</td>
</tr>
<tr>
<td>Surface Form: [no.šək.ta]</td>
</tr>
</tbody>
</table>

This syllable-based analysis provides deeper insight into word stress in Maaloula Aramaic. On the one hand, it comprehensively explains the interaction between stress and syllabification, and on the other hand, it is capable of providing a stress algorithm for the language in moraic terms.18

(32) Maaloula Aramaic stress algorithm (moraic version)

(a) Stress the final syllable if it is bimoraic:

\[
/\text{gabrm-}o/ \rightarrow \left[ \begin{array}{c}
\mu \\
\text{gab. (r). no}
\end{array} \right] \quad \text{‘men’} \quad \text{III.364}
\]

\[
/\text{rayš-ay-n}/ \rightarrow \left[ \begin{array}{c}
\mu \\
\text{ray. šay. (n)}
\end{array} \right] \quad \text{‘their heads’} \quad \text{III.350}
\]

(b) Otherwise stress the penultimate syllable if it is bimoraic:

\[
/\text{tarČ-}a/ \rightarrow \left[ \begin{array}{c}
\mu \\
\text{tar. ta}
\end{array} \right] \quad \text{‘door’} \quad \text{IV.68}
\]

\[
/\text{bisni-T-}a/ \rightarrow \left[ \begin{array}{c}
\mu \\
\text{bis. ňi. ta}
\end{array} \right] \quad \text{‘girl’} \quad \text{IV.32}
\]

\[
/\text{tinaŋel-T-}a/ \rightarrow \left[ \begin{array}{c}
\mu \\
\text{ti. na. ņel. ča}
\end{array} \right] \quad \text{‘hen’} \quad \text{IV.124}
\]

---

18 We added (c) to the original algorithm to accommodate the polysyllabic words treated in the literature as exceptions to the stress rule (see Arnold, 1990: 41). We do not consider them exceptions since they systematically adhere to (c).
(c) If neither the final nor the penultimate syllable is bimoraic, stress the penultimate syllable in disyllabic words and stress the antepenultimate syllable in polysyllabic words:

Penultimate stress in disyllabic words:

/baḥar/ → [ɪˈba. ḍar] ‘a lot; very’ III.146

Antepenultimate stress in polysyllabic words:

/ʕarabeṭ/ → [ɪˈʕa.ra. beṭ] ‘Arabic’ III.184

/ʕaly-T-a/ → [ɪˈʕa.li. ˈa] ‘leaf’ III.154

/mi-č-rattit-in/ → [mɪ ˈrɛtɪt. tin] ‘they visit frequently’ III.260

(c) Vowel epenthesis occurs within as well as across word boundaries.

The domain of postlexical resyllabification is the phonological phrase, rather than the phonological word. Therefore, epenthesis applies whenever a stray consonant is preceded by a coda consonant even when they are separated by a word boundary, as the examples below show.

(33) underlying form lexical level postlexical level

/ex ḥmīr-a/ → [ˈɛxʃ. ˈmɪ.ra] → [ˈɛ.xe. ˈmɪ.ra] ‘like dough’ III.28

/kalles ḡlūk-a/ → [ˈkæl.les#(j).ˈlʊ.ka] → [ˈkæl.le.ˈʌs.ˈlʊ.ka] ‘some firewood’ IV.108

/balleš ṣyūh-a/ → [ˈbæl.les#(s).ˈyʊ.ha] → [ˈbæl.le.ˈʌs.ˈyʊ.ha] ‘he started shouting’ III.354

This assumption is also in line with the available literature on both Maaloula Aramaic and Arabic which clearly shows that word boundaries and syllable boundaries do not necessarily match (see Arnold, 1990: 39 for Maaloula Aramaic and Broselow, 2017: 36 for Arabic).

3.6. Vowel epenthesis and gemination

Maaloula Aramaic geminates occur in word-initial, word-medial, and word-final position (Arnold, 1990: 17). One important property of geminates is that they cannot be split by an epenthetic vowel. This property is called “integrity” by Hayes (1986) (see also Davis, 2011). When an underlying geminate is followed by a consonant, the sequence /GGC/ does not undergo vowel epenthesis (i.e., *[G ə GC]), in contrast to the sequence /CCC/ which surfaces as [C ə C]. What happens instead, in Maaloula Aramaic, is that the geminate consonant /GG/ is degeminated (i.e., is realized as [C]) when it occurs in preconsonantal position (Arnold, 1990: 17), as in (34). This phenomenon is also known in other Semitic languages (see, e.g., Cowell, 1964: 27 for Damascus Arabic; Jastrow, 1993: 17 for Turoyo; Watson, 2002: 210 for Sanʿani Arabic).

(34) Preconsonantal degemination

/ḍo̱kk-T-a/ → [ˈdɔk.ˈta] ‘place’ IV.306

/mʕarr-T-a/ → [ˈmʕar.ˈta] ‘cave’ III.368

/ʃattr-e/ → [ʃˈat.ɾe] ‘he sent him’ IV.104

/ɡarrb-ičč-un/ → [ɡər.ˈbič.ɾun] ‘I tried them (MASC)’ III.80
When geminates are at word edges (i.e., in word-initial or word-final position), the outer part of the geminate behaves as a stray consonant with regard to vowel epenthesis and resyllabification, as the examples in (35) show.

(35)  
\[ \begin{align*}
&\text{Maaloula Aramaic} && \text{Damascus Arabic} \\
&t\text{ar} + pp\text{\ddot{o}}b\text{an} & [t\text{ar}.\ddot{\text{c}}\# pp\text{\ddot{o}}.b\text{an}] & [t\text{ar}.\ddot{\text{c}}. p\text{\ddot{o}}.b\text{an}] & \text{‘two loaves’} & \text{Ill.128} \\
xull + bl\text{\ddot{\text{a}}}t\text{o} & [x\text{\ddot{u}}l\# (b).l\text{\ddot{a}}.t\text{o}] & [x\text{\ddot{u}}l.l\text{\ddot{a}}.t\text{\ddot{o}}] & \text{‘all villages’} & \text{Ill.172}
\end{align*} \]

3.7. A cross-linguistic perspective

Although Maaloula Aramaic is not a variety of Arabic, it bears similarities with the surrounding Arabic dialects. This should come as no surprise, given the fact that they are all Semitic varieties, and given that Aramaic has been in contact with Arabic over many centuries. Maaloula Aramaic is more similar to VC-dialects than to CV-dialects. For example, in both Maaloula Aramaic and Damascus Arabic, the epenthetic vowel is inserted before the stray consonant (see (36)). Moreover, the relation between stress and epenthesis is opaque in both varieties because epenthesis applies postlexically (see Kiparsky, 2003: 150, 156–157).

(36) underlying lexical postlexical
\[ \begin{align*}
\text{Maaloula Aramaic} & /t\text{ar}/ & ['t\text{ar}].\ddot{c} \rightarrow ['t\text{a}r\dot{c}] & \text{‘two (FEM)’} & \text{Ill.274} \\
\text{Damascus Arabic} & /d\text{aras-t}/ & [\text{da}.r\dot{a}.s.t] & \text{‘I studied’} & \text{(Cowell, 1964: 19)}
\end{align*} \]

However, in Cairene Arabic, according to Kiparsky (2003: 157) and as example (37) shows, the epenthetic vowel [i] is inserted at the lexical level immediately after the consonant that would otherwise be left unsyllabified. This is because stray consonants are not allowed to surface either lexically or postlexically. That epenthesis applies lexically makes all syllables, including the one which contains the epenthetic vowel, equally visible to stress.

(37)  
\[ \text{Epenthesis and syllabification in Cairene Arabic (a CV-dialect)} \]
\[ \begin{align*}
\text{underlying form} & \rightarrow \text{surface form (lexical and postlexical)} \\
/b\text{int-na}/ & \rightarrow [\text{bin}.\text{t}i.na] & \text{‘our daughter’} & \text{(Kiparsky, 2003: 150)}
\end{align*} \]

On the other hand, the ability of Maaloula Aramaic to tolerate CCC sequences word-medially and word-initially (as seen in (11) above) makes it similar to the C-dialects of Arabic (see Hellmuth, 2013: 56). Since Maaloula Aramaic shows features of both VC- and C-dialects (as illustrated in (38)), we propose to call it a vC-dialect to distinguish it from VC- and C-dialects. Future research will have to determine whether further Semitic varieties belong to this category.

(38)  
\[ \text{Maaloula Aramaic compared to the different Arabic dialect groups} \]

<table>
<thead>
<tr>
<th></th>
<th>Maaloula Aramaic</th>
<th>Arabic VC-dialects</th>
<th>Arabic CV-dialects</th>
<th>Arabic C-dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medial CCC</td>
<td>surfaces as CVCC / CCC</td>
<td>surfaces as CVCC</td>
<td>surfaces as CCVC</td>
<td>surface as CCC</td>
</tr>
<tr>
<td>Phrase-final CC</td>
<td>variation in the application of vowel epenthesis</td>
<td>not permitted/ permitted (only with falling sonority)</td>
<td>permitted</td>
<td>permitted</td>
</tr>
<tr>
<td>Phrase-initial CC</td>
<td>permitted</td>
<td>permitted (but may be broken up by a prosthetic vowel)</td>
<td>not permitted</td>
<td>permitted</td>
</tr>
<tr>
<td>Initial geminates</td>
<td>permitted</td>
<td>permitted (but may be broken up by a prosthetic vowel)</td>
<td>not permitted</td>
<td>permitted</td>
</tr>
<tr>
<td>Non-final CVVC</td>
<td>permitted</td>
<td>permitted</td>
<td>shortened</td>
<td>permitted</td>
</tr>
<tr>
<td>Epenthesis/stress interaction</td>
<td>permitted</td>
<td>opaque</td>
<td>not opaque</td>
<td>no epenthesis</td>
</tr>
</tbody>
</table>
4. TWO ADJACENT STRAY CONSONANTS

So far, we have investigated the words which contain single stray consonants. In this section, we turn to the words which contain two adjacent stray consonants (hereafter C'C').

Most of the words containing C'C' in our word list are the result of morphosyntactic processes. Nearly all of the attested words are word-forms (or morphosyntactic words) rather than lexemes that can be listed as dictionary entries. This can be easily verified by checking Arnold's (2019) dictionary, in which only three of the attested words appear as lemmas. These three words are shown in (39).

(39) underlying forms surface forms (lexical and postlexical)
\[ /bôyk-T-a/ \rightarrow [\text{bô.}(y)/(k)\{ta\}] \quad \text{‘stable (for animals)’} \quad \text{III.366} \\
\[ /tôyf-T-a/ \rightarrow [\text{tô.}(y)/(f)\{ta\}] \quad \text{‘religious denomination’} \quad \text{III.260} \\
\[ /môyt-T-a/ \rightarrow [\text{mô.}(y)/(l)\{ta\}] \quad \text{‘altar table; dining table’} \quad \text{III.234} \\

Apart from these three words, all the other attested words are word-forms that result from morphosyntactic processes, such as suffixation (40a-b), formation of the enumerative plural (40c), root-and-pattern morphology (e.g. inflected verbs which belong to specific verb forms, such as form I8 (see Arnold, 1990: 93) and form I10 (see Arnold, 1990: 96)) (40d), and the concatenation of words in connected speech (40e).

(40) Morphosyntactic processes leading to C'C'

(a) C'C' resulting from the suffixation of -\(l\)
\[ /môr-l/ \rightarrow \text{[mô.}(r)/(l)# } \text{‘owner of the field’} \quad \text{III.94} \\
\[ /bawwøp-ô-xun/ \rightarrow \text{[baw.}wô.\{p\}/(ô)xun] \quad \text{‘gate’} \quad \text{III.306} \\

(b) C'C' resulting from enumerative plural formation
\[ /sôh-ô/ \rightarrow \text{[sô.}(h)/(ô)] \quad \text{‘witnesses’} \quad \text{III.372} \\

(c) C'C' resulting from root-and-pattern morphology
\[ /nôk-ô/ \rightarrow \text{[nô.}(ô)/(ê)] \quad \text{‘she met him’} \quad \text{IV.154} \\

(d) C'C' resulting from the concatenation of words in connected speech
\[ /fôr-ô/ \rightarrow \text{[fô.}(ô)/(ê)] \quad \text{‘two cubits’} \quad \text{III.110} \\

19 In the original reference, it is spelled as tôyfå.
20 This word appears as môytå in Arnold's transcription of the narrative (III.234) but as mayfå in Arnold's (2019: 582) dictionary. In the example above, we cite the former. The underlying \(l\) assimilates to the following \(l\).
21 The suffix -\(l\) can be attached to nouns, verbs, and prepositions, connecting them to a following noun (Arnold, 1990: 19).
22 The enumerative plural is the plural form used after numerals (Arnold, 1990: 289).
23 Arnold (1990: 53–54) classifies Maaloula Aramaic verbs into eleven forms: I, II, III, IV, I2, II2, III2, IV2, I7, I8, and I10. In the verbal form I8, the infix -ô- is inserted after the first radical (Arnold, 1990: 65). In certain inflectional forms, however, such as nôkalå ‘she met him’ (whose root is nky (Arnold, 2019: 617)), the infix -ô- is inserted after the first radical n and immediately before the second radical k, resulting in a #CCC sequence. From a cross-linguistic perspective, the Maaloula Aramaic verbal form I8 corresponds to the Arabic verbal form VIII, and the Maaloula Aramaic infix -ô- corresponds to the Arabic infix -\(l\)- (see, e.g., Watson, 2002: 134).
4.1. Epenthesis in the case of C'C'

As can be seen from examples (40a, c, e) above, these C'C' clusters rarely surface because an epenthetic vowel is usually inserted between them. This generalization can be expressed as a phonological rule:

(41) Vowel epenthesis in case of C'C'
\[ \emptyset \rightarrow a \mid C'\_\_C' \]

The following words provide further examples of this rule:

(42) Epenthesis in the environment C'\_\_C'
\[ t\text{ašš}-r\text{iš}-n-\emptyset \rightarrow [\text{t}a\text{š}.\text{r}i\text{š}(.\text{n})] \rightarrow [\text{t}a\text{š}.\text{r}i\text{š}en]^{24} \]
leave.PRET-2F.SG-LM-1SG
\[ 'y\text{ou (FEM SG) l}e\text{ft me}' \rightarrow I\text{V.320} \]
\[ zx-i\text{c}-n-\emptyset \rightarrow [\text{z}i\text{x}(.\text{c})(\text{n})] \rightarrow [\text{z}i\text{x}en] \]
defeat.PRET-2M.SG-LM-1SG
\[ 'y\text{ou (MASC SG) d}e\text{feated me'} \rightarrow I\text{V.138} \]
\[ l\text{īṭ}-\emptyset^{25} \rightarrow [\text{l}i\text{ṭ}(.\text{l})] \rightarrow [\text{l}i\text{ṭ}\text{r}] \]
rotl-EPL
\[ 'r\text{otto (ENUM PL)}' \rightarrow I\text{I.274} \]
\[ h\text{ōl}-\text{č}-\emptyset \rightarrow [\text{h}ō\text{l}(.\text{c})] \rightarrow [\text{h}ō\text{lač}] \]
uncle-F-1SG
\[ 'm\text{y m}a\text{ternal aunt}' \rightarrow I\text{V.130} \]

Epenthesis in the environment C'\_\_C' can also apply across word-boundaries. This can be seen in example (40e) which is repeated below for convenience:

(43) t\text{arč} d\text{grōf}-\emptyset \rightarrow [\text{t}ar\text{.c}#(\text{d}).\text{rō}(.\text{č})] \rightarrow [\text{t}ar\text{.čad}\text{.rō}(.\text{č})] \]
two,F cubit-EPL
\[ 't\text{wo cubits}' \rightarrow I\text{I.110} \]

Example (43) reveals another similarity between Maaloula Aramaic and Damascus Arabic. In both varieties, if the C'C' sequence results from the concatenation of two words in connected speech, an epenthetic vowel is inserted between them, and the two stray consonants are resyllabified around the epenthetic vowel at the postlexical level (see (44) for a Damascus Arabic example).

(44) b\text{ant} z\text{gīr}-e \rightarrow [\text{b}an(.\text{t})#(\text{z}).\text{gīr}\text{re}] \rightarrow [\text{b}an\text{.taż}\.\text{gīr}\text{re}] \]
girl little-F
\[ 'a l\text{ittle girl}' \quad (\text{Cowell, 1964: 29}) \]

Not only is the phrase t\text{arč} d\text{grōf}, given in (43), an example of epenthesis that applies across word-boundaries, but it is also an interesting case that would meet the conditions of both epenthesis rules which have been introduced in (27b)

---

24 The underlying geminate /šš/ surfaces as [š] because geminates are realized as singletons in preconsonantal position (see Arnold, 1990: 17).
25 l\text{tar} in the original text.
(i.e., $\emptyset \rightarrow a / C\_\_C'$) and (41) (i.e., $\emptyset \rightarrow a / C\_\_C'$). This raises the question of why (41) is applied, and not (27b). We propose that directionality is responsible for this. According to Itô’s (1989) notion of directionality, syllabification can go either from left to right in some languages (e.g. Cairene Arabic) or from right to left in other languages (e.g. Iraqi Arabic).

In Maaloula Aramaic, we clearly distinguish between lexical syllabification and postlexical resyllabification. In section 3.3, we showed that in lexical syllabification, the nucleus is formed first, then the onset, and then the coda. In other words, lexical syllabification seems to spread from the center (the nucleus) to the left (the onset) and then to the right (the coda). This means that it goes neither exclusively from left to right, nor exclusively from right to left.

In contrast, postlexical epenthesis and resyllabification have a clear direction: right-to-left. As can be seen in (45b), the epenthetic vowel is inserted before the right stray consonant $[\text{ḏ}]$, and not before the left stray consonant $[\text{č}]$. The resyllabification, shown in (45c), preempts (or bleeds) the epenthesis rule in the $C\_\_C'$ environment because $[\text{č}]$ is no longer a stray consonant. Thus, (41) bleeds (27b).

4.2. $C\_\_C'$ yet no epenthesis

The rule $\emptyset \rightarrow a / C\_\_C'$ applies to many words in Maaloula Aramaic, as the examples in the previous section show. However, this rule is blocked in certain words in which $C\_\_C'$ are immediately followed by an onset consonant within the same word (i.e. #..$C\_\_C$..#). It is this specific environment that the four attested words in (11), repeated here as (46), have in common. These data had prompted the question as to why epenthesis is not permissible even though there is a consonant cluster (the fourth question in section 2.3):

(46) (a) word-initial CCC clusters (i.e. #CCC-)

$s\text{čfītīč}$ (and not *$s\text{čfītīč}$) ‘you (MASC SG) benefited’ V.39

$s\text{čfēt}$ (and not *$s\text{čfēt}$) ‘benefit!’ V.39

(b) word-medial CCC clusters (i.e. -CCC-)

$s\text{uščxen}$ (and not *$s\text{uščxen}$) ‘your (FEM PL) horse’ V.38

$f\text{rīsčxun}$ (and not *$f\text{rīsčxun}$) ‘your (MASC PL) right’ V.38
By applying the syllabification scheme presented in this paper to the words in (46), one can notice the presence of the #..C'C...# environment (see (47)). In these CCC clusters, C₁ and C₂ are two adjacent stray consonants, and C₃ is an onset consonant of the following syllable:

(47) Syllabification of the words in (46)

(a) word-initial CCC clusters (i.e. #CCC-)

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical and postlexical forms</th>
<th>ungrammatical forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sčfīt-ič/</td>
<td>[(s)č.fi.č]</td>
<td>*[sčč. f.tič]</td>
</tr>
<tr>
<td>/sčfēt/</td>
<td>[(s)č.fet]</td>
<td>*[sčč. f.et]</td>
</tr>
</tbody>
</table>

(b) word-medial CCC clusters (i.e. -CCC-)

<table>
<thead>
<tr>
<th>underlying forms</th>
<th>lexical and postlexical forms</th>
<th>ungrammatical forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sūs-T-xen/</td>
<td>['sū.(s)č.xen]</td>
<td>*['sū.sčč.xen]</td>
</tr>
</tbody>
</table>

These four examples are not the only words with the environment #..C'C...# in Maaloula Aramaic. Our word list provides further examples of this epenthesis-blocking environment. A careful examination of these examples shows that they are not random exceptions as they share interesting structural properties. To lay out these properties, we will classify these words into two groups according to the position of C'C inside them (i.e. words with initial C'C' and words with medial C'C').

4.2.1. Words with initial C'C'

Our dataset includes 24 words with initial C'C', in all of which C'₂ = ['č]. These words are inflected forms of only seven different verbs. The words in (48) represent one example from each verb.
(48) Structural analysis of the words with initial C’C’

(a) **nčk-al-le**  
meet.PRET-3F.SG-OM-3M.SG  
‘she met him’  IV.154

(b) **ščfet**  
benefit.IMP-2M.SG  
‘benefit!’  V.39

(c) **ščlik-Ø-n-e**  
catch.PRET-3M.SG-LM-3M.SG  
‘he caught it/him’  IV.240

(d) **ščh-ačč-e**  
find.PRET-3F.SG-3M.SG  
‘she found him’  IV.252

(e) **ščgel-l-ax**  
work.IMP-OM-2M.SG  
‘work!’  IV.108

(f) **xčff-in**  
argue.PRF-M.PL  
‘they [were/have been] arguing’  IV.86

(g) **žčmč-in**  
gather.PRF-M.PL  
‘gathered together’  III.252

The templates in (49) represent the syllable structure of these words.

(49) Templates of words with initial C’C’

If this generalization is compared with what the literature says about Damascus Arabic, another similarity can be drawn. Cowell (1964: 25) indicates that word-initial CCC clusters are attested in Damascus Arabic but only in few words beginning with [st] (see (50)).

(50) underlying forms       surface forms (lexical and postlexical)


26 Incorrectly written as ščlkle in the original text.
It seems that the words that begin in #C'C' are not many in either variety, and that the segments filling the C₂ slot are strictly limited to one specific consonant in each variety ([ğ] in Maaloula Aramaic and [t] in Damascus Arabic). With regard to the segments filling the C₁ slot, they are more varied in Maaloula Aramaic than in Damascus Arabic.

4.2.2. Words with medial C'C'

The attested words with medial C'C' are more numerous and can be further divided into two groups. The first group is the result of a productive suffixation process whereby the suffixes -xun ‘your (MASC PL)’ and -xen ‘your (FEM PL)’ are attached to base words of a specific structure. These base words are feminine nouns marked by the feminine morpheme /TI/ and they have a long vowel (e.g. [i], [o], [u]) in the last syllable of the base. The suffixation process concatenates C'C' between the long vowel of the base and the consonant-initial suffix -xun or -xen. The C₂ position is always occupied by an allomorph of the feminine morpheme /TI/ (either [ţ] or [ţ]). The words in (51) exemplify this group.²⁷

(51) underlying forms | surface forms (lexical and postlexical)
---|---
/sus-T-xen/ | [ˈsū.(s)ˈč.xen] ‘your (FEM PL) horse’ V.38
/fris-T-xun/ | [(f)ˈrī.(s)ˈč.xun] ‘your (MASC PL) right’ V.38
/bawwob-T-xun/ | [baw.ˈwō.(p)ˈč.xun]²⁸ ‘your (MASC PL) gate’ III.306
/ḥöl-T-xen/ | [ˈḥō.(l)ˈč.xen] ‘your (FEM PL) aunt’ FW
/ɡmōf-T-xun/ | [ˈɡm.ˈmō.(l)ˈč.xun] ‘your (MASC PL) group’ FW
/ɡor-T-xun/ | [(d).ˈrī.(l)ˈč.xun] ‘your (MASC PL) house’ FW
/mḏin-T-xun/ | [(m)ˈdī.(n)ˈč.xun] ‘your (MASC PL) city’ FW
/mrōy-T-xen/ | [(m)ˈrō.(y)ˈč.xen] ‘your (FEM PL) mirror’ FW
/šuṭṭay-T-xun/ | [ˈšuṭ.ˈṭī.ˈč.xun] ‘your (FEM PL) mirror’ FW
/šayfay-T-xun/ | [ˈšay.ˈfō.(y)ˈč.xun] ‘your (MASC PL) summer’ FW

The reason why one only finds inflectional forms with the suffixes -xun and -xen, and not with other suffixes, is that -xun and -xen are the only pronominal suffixes which begin with a consonant (see Arnold, 1990: 43 for a complete list of the pronominal suffixes). The suffixation to any other personal pronouns would not concatenate word-medial C'C' as is shown in (52).

(52) underlying forms | surface forms (lexical and postlexical)
---|---
/fris-T-e/ | [(f)ˈrī.(s)ˈče] ‘his right’ FW
/fris-T-a/ | [(f)ˈrī.(s)ˈča] ‘her right’ FW
/fris-T-un/ | [(f)ˈrī.(s)ˈčun] ‘their (MASC) right’ FW
/fris-T-en/ | [(f)ˈrī.(s)ˈčen] ‘their (FEM) right’ FW
/fris-T-ax/ | [(f)ˈrī.(s)ˈčax] ‘your (MASC SG) right’ FW
/fris-T-iš/ | [(f)ˈrī.(s)ˈčiš] ‘your (FEM SG) right’ FW
/fris-T-i/ | [(f)ˈrī.(s)ˈči] ‘my right’ FW
/fris-T-ah/ | [(f)ˈrī.(s)ˈčah] ‘our right’ FW
but /fris-T-xun/ | [(f)ˈrī.(s)ˈč.xun] ‘your (MASC PL) right’ V.38
/fris-T-xen/ | [(f)ˈrī.(s)ˈč.xen] ‘your (FEM PL) right’ FW

The second group of words with medial C'C' includes three feminine nouns that were originally introduced in (39) and are repeated here as (53). Unlike the words in the first group, these words are lexemes (i.e. no inflectional processes are...

²⁷ Only three examples were found in the word list. The rest were elicited from our language consultant. Since this is a productive suffixation process, more word forms can still be generated.
²⁸ /b/ is realized as [p] because it occurs before a voiceless consonant.
involved in their formation). All three words are structurally similar in that they have the long vowel [o], C'₁ = [y], and the feminine marker occupies the position of the onset consonant following C'₂.

(53) underlying forms surface forms (lexical and postlexical)
/bŏyk-T-a/ → ['bo.₃(y)(k).ta] ‘stable (for animals)’ III.366
/tŏyf-T-a/ → ['t.o.₃(y)(f).ta] ‘(religious) denomination’ III.260
/mŏyf-T-a/ → ['mŏ.₃(y)(f).ta] ‘altar table; dining table’ III.234

The structure of these two groups can be summarized by the template shown in (54).

(54) Template of words with medial C'C'

From a comparative perspective, this is where Maaloula Aramaic differs completely from Damascus Arabic (see the examples in (55)). In Damascus Arabic, an epenthetic vowel is inserted between two potential word-medial stray consonants (e.g. between [t] and [l] in [ka.tab.₃tel.ha] and in [(f).di.₃tel.kon]). The first example (i.e. [ka.tab.₃tel.ha]) is from Broselow (1992: 41) and Kiparsky (2003: 164), and the second example (i.e. [(f).di.₃tel.kon]) is from the authors. As Kiparsky (2003: 163) explains, this epenthesis must apply lexically, which explains why in these examples the syllable [tel₃] receives primary stress. If epenthesis applied postlexically (as it does in the case of single stray consonants), then this syllable would be invisible to stress, but this is obviously not the case. Maaloula Aramaic, however, does not seem to allow lexical epenthesis, which also means that it does not allow any interaction between epenthesis and stress. Nor does it allow postlexical epenthesis in the #..C₀C₀# environment. Therefore, /frīs-T-xun/ surfaces as [(f).ri.₃(s)(j).xun] at the lexical and postlexical levels.

(55) underlying forms surface forms (lexical and postlexical)
Damascus Arabic /katab-t-l-ha/ → [ka.tab.₃tel.ha] "[ka.tab.₃(l).ha] ‘I wrote to her"

5. SUMMARY AND DISCUSSION

The main goal of this paper was to examine syllable structure and syllabification in Maaloula Aramaic from a cross-linguistic perspective. We have proposed a syllable-based analysis that draws on previous analyses of similar phonological processes in Arabic. Our analysis successfully addresses most of the gaps and shortcomings of previous anal-

²⁹ Literally: ‘I’ve become free (of my obligations) to deal with you / attend to you.’
yses. It highlights the role of the syllable and syllabic structure, rather than that of the segment or of the word boundary, in the vowel epenthesis process and also accounts for the opaque relation between epenthesis and stress.

The proposed approach can be summarized as follows. Maaloula Aramaic allows only three syllable types: CV, CVV, and CVC. These three syllable types are the result of a syllabification process which takes place at the lexical level. The unsyllabified consonants, called ‘stray consonants’, are tolerated at the lexical level. At the postlexical level, an epenthetic vowel [ə ~ i] is inserted between a stray consonant (C') and the preceding coda consonant. Epenthesis triggers a resyllabification process in which the coda of the preceding syllable becomes the onset of a new syllable, the epenthetic vowel becomes the nucleus, and the stray consonant becomes the coda. These postlexically formed syllables are not visible to stress because stress rules are lexical.

If a morphosyntactic process leads to the concatenation of two stray consonants (C'C), an epenthetic vowel is usually inserted between them. This epenthesis is blocked, however, in words with specific structural properties in which C'C are followed by an onset consonant within the same word (i.e., when the C'C sequence is in non-final position).

In summary, vowel epenthesis in Maaloula Aramaic applies according to the following rules:

\[
\begin{align*}
\emptyset & \rightarrow \text{a / C}_{\text{n..C}}' \\
\emptyset & \rightarrow \text{a / C}_{\text{C..C}}' \quad \text{(exceptions are attested, but they are not random)}
\end{align*}
\]

Insert an epenthetic vowel between a stray consonant and a preceding coda consonant, or between two stray consonants, except in words with specific structural properties in which the C'C sequence is in non-final position.

These rules are exemplified in (56):

<table>
<thead>
<tr>
<th>(56)</th>
<th>Syllabification, epenthesis, and resyllabification exemplified</th>
</tr>
</thead>
<tbody>
<tr>
<td>/nūr-al/</td>
<td>/noš-T-al/</td>
</tr>
<tr>
<td>‘fire’ III.80</td>
<td>‘kiss’ V.37</td>
</tr>
<tr>
<td>–</td>
<td>[nošg.(k).ta]</td>
</tr>
<tr>
<td>–</td>
<td>[no šag.ta]</td>
</tr>
<tr>
<td>[‘nū.ra]</td>
<td>[no šag.ta]</td>
</tr>
</tbody>
</table>

This derivation shows that a word-medial CCC sequence can either show epenthesis, or not. For instance, in the word /noš-T-al/ ‘kiss’ epenthesis applies, while in /fris-T-xun/ ‘your right’ epenthesis is blocked. What is responsible for this variation? In both words, C3 is syllabified as an onset and C2 remains unsyllabified (i.e., a stray consonant). However, the two words differ in the syllabification of C1, which is a coda in [noš.(k).ta] and a stray consonant in [(f).rī.(s).(č).xun]. In [noš.(k).ta], since C2 is a stray consonants preceded by a coda consonant, epenthesis can apply. In [(f).rī.(s).(č).xun], C1 and C2 are stray consonants, but since both of them are in non-final position, epenthesis is blocked.

There is another interesting problem concerning the status of [č] as C2. The examples presented so far in which epenthesis is blocked may suggest that it is enough to have a C'C sequence in which C'2 is [č] to block epenthesis. But this is not true. Rather, even if C'2 is [č], epenthesis is blocked only in the #..C'1C'2..# environment. In other words, for epenthesis to be blocked, neither C'1 nor C'2 may occur in word-final position. For example, epenthesis is not blocked in the examples in (57) although they have the sequence C'1C'2 and C'2 is [č]. It is not blocked because C'1 is in word-final position in (57a), and because C'2 is in word-final position in (57b). Note that clitic groups (i.e. clitics and their hosts, such as the first example) are treated as two separate words in this work (see the rationale in the introduction of section 3).
Vowel epenthesis although $C_2$ is $[\ddot{c}]$

(a) $C_1$ in word-final position

$b=\ddot{c}b\ddot{r}-t$  
$\ddot{t}ar\ddot{c}-a$  

(with=breaking-CST  
‘by breaking the door’ (Arnold, 2002: 32)

$y-ib-\ddot{O}$  
$\ddot{c}-n\ddot{a}h\ddot{h}e\ddot{c}-\ddot{O}$  

$3$-be.SBJV-M.SG  
‘then you (MASC SG) must be going down’ IV.250

(b) $C_2$ in word-final position

$\ddot{h}ol-\ddot{c}-\ddot{O}$  

‘my maternal aunt’ IV.130

$fr\ddot{i}-\ddot{c}-\ddot{O}$  

‘my right’ FW

6. IMPLICATIONS

From a typological perspective, we can say that Maaloula Aramaic and Damascus Arabic (a VC-dialect of Arabic) are similar in their treatment of single $C$’s, of two adjacent $C’C’$ resulting from the concatenation of words in connected speech, and (to some extent) of word-initial $C’C’$. They are also similar with respect to the relation between epenthesis and stress. However, in the words containing word-medial $C’C’$, Maaloula Aramaic and Damascus Arabic exhibit major dissimilarities in terms of epenthesis and epenthesis-stress interaction.

This study has implications for the areas of syllable structure and vowel epenthesis in phonological theory. Our results support syllable-based accounts of epenthesis (e.g. Broselow, 1992; Itô, 1989; Kiparsky, 2003; Selkirk, 1981; Watson, 2007, 2002), and they challenge accounts which claim that epenthesis can be accounted for purely by sequential constraints (e.g. Côté, 2000) or by segmental constraints. For example, vowel epenthesis, in Maaloula Aramaic, does not apply to prohibit two identical or similar segments from being adjacent, which would be expected according to the Obligatory Contour Principle (OCP) (see Goldsmith, 1976; Leben, 1973; McCarthy, 1986, 1979). If this were the case, then the epenthetic vowel would be inserted whenever any two similar segments are adjacent (regardless of their position in the syllable) and not strictly in the $C\ddot{c}C’C$ and $C’C’C$ environments. For instance, the epenthetic vowel would be inserted in the $C’\ddot{c}C$ environment if the conditions were met, but this is clearly not the case. Having said that, we are not arguing that segmental effects do not exist or do not play any role in vowel epenthesis. Their effect has been shown on two occasions in this paper. First, we have noted in section 2.3 that segmental constraints (especially sonority) may be responsible for the optionality in the application of vowel epenthesis. Second, we have shown that the words which resist epenthesis share structural and segmental properties.

Our study also calls into question two cross-linguistic assumptions about stray (or extrasyllabic) consonants by Kiparsky (2003: 156). Kiparsky claimed that stray consonants (or “semisyllables” in his terms) have a “restricted segmental inventory” (Kiparsky, 2003: 156). Although this may be true for a number of languages, such as English (see, e.g., Giegerich, 1992, chap. 6) and German (see, e.g., Wiese, 1992), this is not a property of Maaloula Aramaic stray
consonants. In Maaloula Aramaic, the segments that may occur as stray consonants do not belong to a specific subset of consonants, as the examples in (58) illustrate.

(58) Some of the segments that may occur as stray consonants in Maaloula Aramaic

(a) Labials:
loʕptə `game; toy’ IV.16
səlfə ‘story’ IV.140
zalemə ‘man’ IV.142

(b) Coronals:
akətərit ‘I was able (to)’ III.56
imət ‘he arrived’ IV.116
iros ‘he accepted’ IV.226
moŋəča ‘key’ IV.70
bisanyọtə ‘girls’ III.376
ﬁsər ‘twenty’ III.304

(c) Dorsals:
šabəkta ‘net’ IV.58
scəfəkte ‘he checked up on him’ IV.214

(d) Pharyngeals:
yarəḥ ‘months (ENUM PL)’ IV.142
acoṭbat ‘she felt tired’32 IV.24

(e) Glottals:
işəḥ ‘he felt thirsty’ III.360
ʒawəhrọtə ‘gems; jewels’ IV.126

The other cross-linguistic assumption made by Kiparsky states that stray consonants are “sometimes restricted to peripheral position (typically word edges)” (Kiparsky, 2003: 156). Although many of the stray consonants in our data can be analyzed as domain-peripheral (i.e., word-peripheral or morpheme-peripheral), there are many other examples of words with word-internal or even morpheme-internal stray consonants, as the ones shown in (59). We believe that stray consonants in Maaloula Aramaic are the result of syllabification and not the result of any alignment constraint which would align stray consonants with word or morpheme edges (for such constraints see, e.g., Cho and King, 2003).

(59) Words with morpheme-internal stray consonants

y-aḥš-m-un [yaḥ.⟨$⟩.mun] → [yaḥaḥ.⟨$⟩.mun]
3-have dinner.SBJV-M.PL ‘(that) they (MASC) have dinner’ III.258

Ø-m-ašph-o-š [maš.(p).ho.⟨$⟩] → [maš.⟨p⟩.ho.⟨$⟩]
3-PRS-resemble-F.SG-2F.SG ‘she looks like you (FEM SG)’ IV.176

In addition to these typological and theoretical aspects, the present study represents a detailed case study of an under-researched language using corpus data, empirical methodology, and universal frameworks, such as moraic phonology. Such theoretically informed case studies involving large amounts of data are necessary to enhance our typological and theoretical understanding of vowel epenthesis cross-linguistically.

31 It is transcribed as səlfə in the original text.
32 This is the literal meaning. In the narrative, the intended (figurative) meaning was that the situation ‘has become bad’.
7. ABBREVIATIONS

ENUM PL enumerative plural
FEM feminine
MASC masculine

8. GLOSS LABELS

1 first person
2 second person
3 third person
Ø zero morpheme
CST construct state
EPL enumerative plural
F feminine
IMP imperative
LM linking morpheme
M masculine
NE nominal ending
OM object marking
PL plural
PRET preterit
PRF perfect
PRS present
SBJV subjunctive
SG singular

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Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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