

Superheavy syllables and the concept *iltiqā? as-sākinayn* in traditional Arabic linguistics

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Abstract: Understanding the Arabic phonological concept *iltiqā? as-sākinayn* is crucial to comprehend traditional studies on Classical Arabic phonology, particularly, aspects related to the syllabic structure of the language. For instance, there is no distinction in traditional sources of Arabic linguistics between CVVC and CVCC syllables; they are identical in being composed of *mutaharrik + sākin + sākin* and not because they are both super-heavy. Hence, the Arabic term *iltiqā? as-sākinayn*, the conjunction of two *sākin* letters, refers to the final two segments of super-heavy syllables, CVVC and CVCC. Traditionally, the account for avoiding syllabic structures such as CVVC and CVCC is to prevent the phenomenon of *iltiqā? as-sākinayn*.

Early Arab linguists touched upon the permissibility of sequences such as VVCC and CCC and how ungrammatical sequences are repaired. But it appears that they were describing the phonology of Arabic from a linear point of view, with no reference to units above the level of segments, e.g. the syllable. This article investigates certain syllabic aspects of Classical Arabic as described in ancient works on Arabic grammar and discusses the analyses that are presented in these works.

Introduction:

Early Arab linguists provided a detailed phonetic study of Arabic. It is amazing how these scholars more than 10 centuries ago touched upon some of the basics of sound study that have come to light in modern phonetics only around two centuries ago. For example, early Arab scholars provided invaluable descriptions of speech organs and sound productions covering the two fundamental parts of articulatory phonetics, i.e. place and manner of articulation. However, the earliest works exclusively devoted to the study of Arabic phonetics and phonology were in the field of *tajwīd* 'orthoepy', i.e., rules of Quran recitation. They appeared three centuries after the early sketches of the sound system of Arabic were published

in the second century A.H.¹ Before that, the study of Arabic sounds used to appear only as a chapter or a section of a large work.

Although ancient studies on Arabic sounds were sophisticated especially in describing the articulatory aspects of the sounds of the language, the phonological studies were less comprehensive. For instance, traditional sources on Arabic phonology assigned certain features to each phoneme and described the combination of phonemes that were permissible accordingly. In addition, they listed what interactions occur between the sounds, the environments in which they occur, and the outcomes of such

¹ The first year A.H. corresponds to the year 622 A.D.

interactions. Moreover, early Arab scholars discussed what sequences of consonants and vowels are allowed in Classical Arabic (henceforth, CA) word formation; for instance, if sequences such as VVCC and CCC are acceptable or not. They explained how ungrammatical sequences are prevented from surfacing through vowel epenthesis and vowel shortening. They were in essence discussing the syllable structure of CA but not in terms of the notion “syllable”. It appears that early Arab linguists described the phonology of Arabic from a linear point of view, without reference to any unit above the level of segments, which explains the absence of any reference to the phenomenon of stress.

The study of CA phonology did not gain as much attention as the syntax of the language (or the *naḥw*) gained or even other Islamic studies such as *tafsīr* ‘Quran interpretation’ or *fiqh* ‘jurisprudence’ during the Islamic intellectual evolution around 12 centuries ago. Numerous works have been written in the fields of *naḥw*, *tafsīr*, and *fiqh*. But more importantly, there were works devoted to establishing the fundamentals for each of these three fields of research; such works were called *ʔuṣūl* ‘foundations’. As far as phonology is concerned, no work concentrated exclusively on this field let alone a work to lay down its basics. Even the “Chapter on assimilation”, the final chapter in Sibawayhi’s *Al-Kitāb*, focused only on assimilation across word boundaries. All other phonological remarks, for example, word-internal assimilation, are scattered in various parts of a variety of works on Arabic. This may be a main reason for traditional phonological studies not to

improve over the years as other traditional studies did.

This article provides a description and analysis of certain syllabic aspects of CA based on how the language was described in ancient works on Arabic grammar and later works commentating on them.

The syllabic structure of Classical Arabic

In CA, each syllable must contain a consonant onset and consonant clusters are permitted syllable-finally but only in utterance-final syllables. Thus, the basic syllables from which words are composed are CV, CVC and CVV, all of which occur freely in CA. On the other hand, the two syllables CVVC and CVCC may surface but only utterance-finally. For example, in pre-pause position,² CVCC and CVVC syllables are allowed as a result of the deletion of word-final short vowels or nunation³ and the short vowel preceding it, as given in (1).

(1) Utterance-final CVVC and CVCC syllables in CA:

- a. /ward+un/ [ward]## ‘rose’
/katab+tu/ [ka.tabt]## ‘I wrote’
- b. /ya+na:m+u/ [ya.na:m]## ‘he sleeps’
/maktu:b+un/ [mak.tu:b]## ‘written’

However, CVVC syllables may occur exceptionally under a certain condition; if their final consonant is the first part of a geminate. The surfacing non-final CVVC syllable is not present in the underlying structure. Rather, it results from a syncope process in CA by which the first vowel in a partial underlying structure $-C_rVC_rV(V)$,

² The terms pre-pause, in pause, and utterance-final will be interchangeably used.

³ Nunation refers to the inflectional suffixes known as *tanwīn* in Arabic linguistics.

whose two identical consonants (marked with the subscript r) are radicals of a doubled root, are deleted.⁴ If this structure follows a long vowel, the outcome is a CVVC syllable, as illustrated in (2).

(2) Non-final (CVVC_r).C_r syllables in CA:

a. root: s-r-r: active participle
C₁aaC₂iC₃un
/sa:rir+un/ [sa:r.run]## ‘pleasing’

b. root: h-ǰ- ǰ: form IV C₁aaC₂aC₃a

/ħa:ǰaǰ+a/ [ħa:ǰ.ǰa]## ‘he argued with’

Moreover, the deletion of the final vowel or vowel+nunation (italicized) from forms such as those in (2) in pre-pausal position produces the extra super-heavy syllable CVVC_rC_r.

(3) Extra super-heavy syllables in CA:

a. [sa:rr]##
b. [ħa:ǰǰ]##

Finally, Shahin (1977) argues that very rarely, geminate-final CVCC, or CVCCG_r syllables, occur word-medially in CA.⁵ In particular, when an active participle is derived for feminine from a doubled root and turned into the diminutive, it surfaces with a non-final CVCC syllable. As shown in (4), the underlying base of the active participle is /ʃa:bib/. The diminutive template for all adjectives and nouns in the form C₁VVC₂VC₃ is C₁uwayC₂iC₃. We would expect the diminutive of (4a) to

surface as in (4b). But because in CA the inter-consonantal short vowel deletes from -C_rVC_rV structures, the diminutive surfaces as given in (4c), as an output with a non-final CVCC syllable.

(4) Non-final (CVCC_r).C_r syllables in CA:

a. /ʃa:bib+at+un/
[ʃa:b.ba.tun] ‘a young woman’
b. *[ʃu.way.bi.ba.tun]
c. [ʃu.wayb.ba.tun] ‘a young woman’
DIMINUTIVE

Having dealt with the syllabic structure in CA, we shall present in the following section certain processes by which potential ungrammatical structures are prevented from surfacing in the language and the traditional analyses of them.

The traditional analysis

A key element in a discussion of any phonological analyses in early Arabic sources is the comprehension of the terms *sākin* and *mutaḥarrrik*. These terms refer to two categories into which early Arab linguists divided the syllabic structures of CA. They are basic units scholars used in describing and analyzing the formation of words and the processes that affected them.

The short vowel diacritical marks of the Arabic script were based on the Arabic metric system. Al-Khalil ibn Ahmed Al-Farahidi who elucidated the prosody of Arabic poetry also invented the current Arabic vowel marks. In this system, the language orthography is composed of letters that are either *sākin* ‘quiescent’ or *mutaḥarrrik* ‘moving’. The latter refers to a consonant followed by a vowel. All other consonants and the second part of a long vowel, all of which are not followed by a

⁴ For reasons of simplicity, doubled roots will be represented with three consonants, even though they are regarded as bilateral not trilateral in modern studies (see, for example, McCarthy, 1982).

⁵ It is rare because it involves doubled roots which are less than 1% (90 out of 9273 roots) in a large Arabic-Arabic dictionary such as *Lisānu l-ʿArab* by Ibn Manzur (Abdel Rahman, 1991).

vowel, are regarded as *sākin* (Ibn Jinni, 1993, v. 1, p. 28). In this phonological system, as well as in Arabic poetic meters, CVV and CVC syllables are equal in their weight, both being heavy (or bimoraic), because from the early Arab grammarians' point of view, these two heavy syllables consist of two letters *mutaḥarrrik* + *sākin*. Presumably to ensure the equivalence of CVV and CVC syllables prosodically, a consonant followed by a long vowel was marked with a short vowel diacritic just like the first consonant in CVC syllables. Since the final consonant of CVC syllables is unvocalized, i.e., not marked with any vowel diacritics, as is the case with the Arabic letters indicating lengthened vowels, the final elements of CVC and CVV syllables are considered prosodically equal.

In traditional sources of Arabic, there is no distinction between CVVC and CVCC syllables not because they are both super-heavy syllables but because they are identical in being composed of *mutaḥarrrik* + *sākin* + *sākin*. Thus, the Arabic term *iltiqāʿ as-sākinayn*, the conjunction of two *sākin* letters, refers to the final two segments of super-heavy syllables, CVVC and CVCC. Traditionally, the reason for avoiding syllabic structures such as CVVC and CVCC is to prevent the phenomenon of *iltiqāʿ as-sākinayn*.

Early Arab grammarians have relied in their phonological analyses on the written aspect of the language more than the phonemic values of its sound system. This resulted in treating all *sākin* sounds equally, whether they are consonants in the coda position, long vowels, or the second part of long vowels. This traditional approach is still the most common in modern works on Arabic phonology,

especially those written in Arabic, maybe for pedagogical reasons. Nevertheless, there are several phonologists who pointed to the inaccuracy of including the underlined sequence in CVVC under the term *iltiqāʿ as-sākinayn*. Khalil (1993), Jeng Huey Tsyr (2002), and Al-Shayib (2004), to name a few, have indicated that the term *iltiqāʿ as-sākinayn* accurately describes the status of the first two consonants in a CCC sequence. However, due to the influence of orthography on early Arab grammarians, they imprecisely included VVC sequences that precede a consonant under this term. Early Arab linguists considered the Arabic symbol named *alif* a *sākin* sound, while phonetically it is a lengthened vowel; thus, it is vocalic and, unlike consonants, it cannot be characterized as being vocalized or unvocalized. The same is true for the two remaining high vowels in Arabic, *wāw* and *yāʾ*. Accordingly, what CA is avoiding, in the case of CVVC syllables, is a sequence of a long vowel and a *sākin* and not two *sākin*'s as is assumed traditionally. Understanding the meaning of the Arabic term *iltiqāʿ as-sākinayn* is crucial to comprehend the traditional descriptions and analyses of CA phonology. In particular, it will help us go over some aspects related to the syllabic structure of CA that are presented below.

As mentioned above, CA syllables do not begin with vowels or clusters of consonants. Therefore, words with initial syllables that might violate this restriction in utterance-initial position are repaired by adding material to the beginning of the word, namely, *hamzatu l-waṣl*, an open syllable composed of a glottal stop and a

*[tak.tu.bu:n] CVVC: b+u+u+n ن + و + ' + ب
 [tak.tu.bun] CVC: b+u+n ن + ' + ب
 d. /ta+ktub+u:+nna/ EMPHASIZED
 3rd/PL/MASC
 *[tak.tu.bu:n.na]
 CVVC: b+u+u+n ن + و + ' + ب
 [tak.tu.bun.na] CVC: b+u+n ن + ' + ب

Notice that the underlying long vowel of a CVVC sequence shortens to avoid any potential, undesired outcome. Early Arab grammarians have analyzed the vowel shortening of CVVC syllables as a case of avoiding *iltiqāʔ as-sākinayn*. When they apply their analysis to an example such as (7a), they say that two *sākin*'s, ʾ and the unvocalized م, are adjacent, which is prohibited in Arabic, thus the ʾ is deleted and the short vowel (or the diacritic َ called *fathah*) remains as an indication of the deleted ʾ.

Using the same concept of *iltiqāʔ as-sākinayn*, early Arab linguists explained why Arabic avoids CVCC syllables, i.e. to avoid a *sākin-sākin* sequence. In this case, the concept of *iltiqāʔ as-sākinayn* accurately fits the description of the first two consonants in a CCC sequence, both of which are unvocalized, as (8) shows, and are therefore labeled *sākin*. Traditional studies on Arabic report two ways by which non-utterance-final CVCC syllables are prevented from surfacing. First, in (8) a vowel is inserted between the final two consonants of CVCC syllables to create with them a new CVC syllable.

(8) /yaktub lwalad/ JUSSIVE
 3rd/SING/MASC
 *[yak.tub].wa.lad]
 CVCC: t+u+b+l ل + ب + ' + ت
 [yak.tu.bi].wa.lad]

CVCVC: t+u+b+i+n ن + + ب + ' + ت

The second strategy CA utilizes to avoid CVCC is metathesis. Consider the examples given in (9) from the doubled root *m-d-d*. Recall that C_rVC_rV structure are not preferred in CA.

(9) a. /ya+mdudu/ INDICATIVE
 3rd/SING/MASC
 [ya.mud.du]
 b. /mdud+u:/ IMPERATIVE
 3rd/PL/MASC
 [mud.du:]

In such examples, Arab grammarians say that the underlined vowel in (9) should delete to avoid a C_rVC_rV structure, but this in turn would yield the ungrammatical outputs *[yamddu] and *[mddu] in which *iltiqāʔ as-sākinayn*, the /m/ and the first /d/, may occur. Thus the language employs metathesis, traditionally called *al-qalb al-makāniyy*, a process by which the order of the undesired vowel and the preceding consonants is reversed, to avoid two unacceptable structures through a single process.

Interestingly, examples (10) and (11) below show a variation that is reported for the pronunciation of doubled verbs with an underlying C_rVC_r in the imperative and jussive moods of the example given in (9a) above.

(10) /ya+mdud/ JUSSIVE
 a. [yam.dud]
 b. [ya.mud.da] (in pre-pausal position
 [ya.mudd])
 (11) /mdud/ IMPERATIVE
 a. [ʔum.dud]

- b. [mud.da]⁷ (in pre-pausal position
[mudd])

According to early Arab grammarians (e.g., Sibawayhi, 1975, v. 3, p. 529) the first variants in (10a) and (11a), which are produced in the Hijazi dialect, are the standard outputs; however, the latter variants in (6b) and (7b), a Banu Tamim's 'the tribe of Tamim' variety, are the most common. Sibawayhi stated that Ahl Al-Hijaz speakers produced such utterances based on its *ʔaʃl* 'origin', or underlying representation, after the vowel deletes, i.e., the same underlying representations in (10) and (11) for example, whereas Banu Tamim's pronunciation seems to be according to existing outputs. It is possible that Sibawayhi is referring to outputs such as those in (9) in some sort of "Paradigm Uniformity".

There are two cases in which CA permits a super-heavy syllable to surface, namely, if its final consonant is part of a geminate or if it occurs utterance-finally. The examples that were presented earlier in (2) showed the conditions under which non-final CVVG_r syllables are permitted. Sibawayhi (1975), Al-Mubarrid (1965), and Ibn Jinni (1993) among others stated that other than utterance-finally, no *ḥarf madd* 'lengthened vowel' is permitted to precede a *sākin*, i.e., a syllable-final consonant in this case, unless the consonant is a geminate. According to these scholars, this is one reason for dual verbs not being emphasized using the suffix *-n*.

⁷ One can argue that metathesis took place to avoid the prosthesis /ʔa/. But this argument is not valid because of verbs such as /stamid/ [ʔis.ta.mid.da]SING/MASC 'derive from!'.

- (12) Imperfective mood for the verb /ktub/ 'to write' + emphasis suffix *-n*:
 a. [tak.tu.ban] 2nd/SING/MASC
 b. /ta+ktub+a:+n/ *[tak.tu.ban] 2nd/DUAL
 c. /ta+ktub+a:+n/ *[tak.tu.ba:n] 2nd/DUAL

As (12) illustrates, if the long vowel is shortened from the dual verb in (12b), it creates a homophony between the emphasized dual verb and its second person, singular, masculine counterpart in (12a); and if the vowel remains long as in (12c), a CVVC syllable in which the final consonant is not a geminate would surface. Since both of these outputs are unacceptable in CA (especially at the lexical level), the emphasis suffix *-n* is not allowed to attach to dual verbs.

Early Arab linguists attempted to explain the exceptional occurrence of CVVG_r syllables. Their explanations were based on two phonetic aspects of this syllabic structure. First, several scholars (e.g., Sibawayhi, 1975; Al-Mubarrid, 1965; and Ibn Jinni, 1993) pointed out that long vowels are longer before a geminate in a CVVG_r syllable than when preceding a singleton. This extra lengthening is equivalent to an insertion of a short vowel (or *ḥarakah*) to the super-heavy syllable. Thus, from a traditional perspective, a super-heavy syllable is composed of *mutaḥarrik* + *sākin* + *sākin* unless its final consonant is part of geminate, in which case it is composed of *mutaḥarrik* + *mutaḥarrik* + *sākin* because the extra lengthening adds an element (a *ḥarakah*) between the two *sākins*. Given this, there is no more *iltiqāʔ as-sākinayn* in a CVVG_r syllable. The second explanation Arab scholars provided regarding the peculiarity

of CVVG_r syllables is that their final consonant which is part of a geminate is shorter than a singleton consonant, the articulators produce two (or a lengthened) consonant(s) in a single movement as opposed to singletons. These final consonants are closer to being part of the following *mutaḥarrik* onset consonant than standing alone as codas, thus creating with the preceding vowel a special, accepted sort of *iltiqāʔ as-sākinayn*.

Although early Arab linguists considerably discussed CVVC_r.C_r structures, they hardly mentioned CVCG_r syllables. This may be due to the infrequency of the latter structure. Even when Sibawayhi gave an example of such a structure in the chapters on the derivation of the diminutive, he briefly mentioned that the unvocalized or *sākin yāʔ* is permitted to precede the geminate just as the *ʔlif* is allowed before it (v. 3, p. 418). Obviously, Sibawayhi is trying to explain the problem of *iltiqāʔ as-sākinayn* in CVVC_r.C_r structures. Ibn Yaʿish (1970) is one of the few Arab scholars who referred to the occurrence of CVVG_r syllables in CA (v. 9, p. 121). An example of a permitted non-final CVCG_r syllabic structure in CA is [ʃu.wayb.ba.tun] (the diminutive of [ʃa:b.ba.tun] ‘a young woman’), given earlier in (6). There is, however, controversy on the phonetic representation of words such as [ʃu.wayb.ba.tun]. Al-Shayib (2004) argued that there is an “extra” short /i/ phoneme between the glide /y/ and the first part of the following geminate in [ʃu.wayb.ba.tun] and similar words. He claims that there is no CCC sequence, or in his terms no *iltiqāʔ as-sākinayn*, because the /y/ is not directly followed by the /b/. The question here is would Al-Shayib transcribe the word as

[ʃu.wa.yib.ba.tun]? To support his position, Al-Shayib quotes Ibn Manzur (1955) who described the /y/ in [ʃuwaybbatun] as having *ishmām min al-kasr* ‘ishmām⁸ of the short vowel /i/’. But the phenomenon of *ishmām* is visually detected and has no phonetic value.

Super-heavy syllables are not preferred in CA. However, as seen above the language permits CVVC and arguably CVCC syllables whose final consonants are geminates. In addition, super-heavy syllables are allowed utterance-finally. According to Sibawayhi, there was variation among CA speakers as to how they treated word-final vowels in pre-pausal context. The majority of CA speakers deleted utterance-final vowels as well as nunnation, hence the widely spread Arabic expression “*lā tagifu al-‘Arabu illa ‘alā sākin*” ‘Arabs pause only on a *sākin*’. This deletion caused the occurrence of utterance-final super-heavy syllables. The reason for the occurrence of super-heavy syllables utterance-finally is that this environment is exceptional and post-lexical. CA generally avoids non-utterance-final CVVC and CVCC syllables (e.g., /yana:m/→[ya.nam] and /yaktublwalad/→[yak.tu.bil.wa.lad]) but permits such syllables in an utterance-final context. The distinction drawn by Ibn Jinni between the unpermitted non-utterance-final super-heavy syllables and the grammatical utterance-final ones is that the former is caused by a permanent deletion of word-final vowels or nunnation while such a deletion is temporary or “incidental” in the latter (Ibn Jinni, 1970, v. 1, p. 60).

⁸ *Ishmām*, according to Palmer (1874), is “insinuating (the sound of a vowel which is not written)” (p. 380).

There are significant remarks in traditional Arabic sources that can be related to several findings in modern linguistics. In what follows, more light is shed on certain characteristics of traditional studies on Arabic phonology.

Discussion

The effect of orthography on Arab grammarians in their phonological analysis of CA is undeniable. Early Arab grammarians relied in their analyses on the written aspect of the language more than the phonemic values of its sound system. This is mostly obvious in the exclusion of short vowels, which are represented by diacritics in the Arabic writing system, from the sound inventory of CA. A consequence of this approach is the identical treatment of the second elements in VC and CC sequences. For example, the super-heavy syllables in examples (13) and (14) below are avoided via vowel shortening and epenthesis, respectively. This is what we would expect based on the examples presented so far, vowel shortening prevents CVVC syllables whereas CVCC syllables are avoided through epenthesis.

(13) Word-final long vowels followed by word-initial clusters in CA:

a. *yarmi: lwaladu* ‘the boy throws’

[yar.mil.wa.la.du]

*[yar.mi:l.wa.la.du]

b. *yatlu: lwaladu* ‘the boy recites’

[yat.lul.wa.la.du]

*[yat.lu:l.wa.la.du]

(14) Word-final glides followed by word-initial clusters in CA:

a. /taxʃay lwalada/
‘you fear the boy’_{FEM/SING}
[tax.ʃa.yil.wa.la.da]

*[tax.ʃayl.wa.la.da]

b. /yaxʃaw lwalada/
‘they fear the boy’_{MASC}
[yax.ʃa.wul.wa.la.da]

*[yax.ʃawl.wa.la.da]

The word-final /i:/ and /u:/ in (13) are orthographically identical with the word-final /y/ and /w/ in (14), respectively; each pair has the same grapheme and all these sounds are unvocalized, as illustrated in (15). Consequently, Sibawayhi (1975) did not distinguish between /i:/ and /y/ or between /u:/ and /w/ in examples (13) and (14); they were each regarded as *sākin*.

(15) Orthographic representations of long high vowels and glides:

i:: ي + ◌ ay: ي + ◌

u:: و + ◌ aw: و + ◌

After vowels shorten in the examples given in (13) to avoid CVVC syllables, the graphemes that follow the diacritical marks are dropped, as (16) shows.

(16) Orthographic representations of short high vowels:

i: ◌

u: ◌

If we base our analysis on orthography, we would wonder why the same does not happen in (14) to prevent CVCC syllables from surfacing. Thus, Sibawayhi felt the need to explain why CA utilizes two different strategies to prevent the same

disfavored phenomenon, *iltiqāʔ as-sākinayn*, presumably because he was influenced by the visual aspect of the language (vol. 4, p. 157). Although Sibawayhi's account was brilliant and based on semantic reasoning, it was unnecessary, given that we are phonologically faced with two different, undesired structures; namely, CVVC and CVCC syllables.

Early Arab scholars were aware that CVVC and CVCC are prosodically heavier than other syllables, especially in their studies of Arabic metrics. Yet they did not refer to this distinction when they explained the avoidance of super-heavy syllables. Moreover, the expression *iltiqāʔ as-sākinayn* is confusing because, for instance, it also includes, in addition to the final two segments in each of the two super-heavy syllables, any sequence of two long vowels VV-VV. For example, Sibawayhi's (1975) explanation of the conjugation of the third person, dual, masculine verb from the verb *rama:* is based on the idea of avoiding *iltiqāʔ as-sākinayn*. Part of his analysis goes as follows: since the final vowel of the verb *rama:* is *sākin* and the subjective suffix for third person, dual, masculine, *-a:*, is also *sākin* they cannot follow each other due to the prohibition of *iltiqāʔ as-sākinayn*. (vol. 4, p. 156)

There is inconsistency in the treatment of CVVC_iC_i syllabic structures in CA. While such structures are avoided via vowel shortening in words such as [tak.tu.bun.na] (cf. *[tak.tu.bu.n.na]) they are allowed to surface in examples like [ma:d.dun]. One observable difference between these two examples is that the geminate in the former is present in the underlying structure while it is derived in

the latter and can only be a result of geminating two root consonants. Early Arab grammarians were aware of the fact that the first vowel deletes from C_iVC_iV only if the identical consonants were root consonants (i.e., C_rVC_rV); however, to my knowledge they did not explain the /ta+ktub+u:+nna/ [tak.tu.bun.na] vs. /ma:did+un/ [ma:d.dun] contradiction until the 13th century A.H. (the 19th A.D.). It was Al-Khudhari (1885) who addressed inconsistency in treating potential CVVC syllables in CA by raising the following question: why are long vowels shortened in examples such as [tak.tu.bun.na] but allowed in those similar to [ma:d.dun]? (v. 1, p. 34). Al-Khudhari's account for this problem was from a lexical point of view; the geminate in [ma:d.dun] is part of the word while that in [tak.tu.bun.na] is a suffix. This account is in line with the possible explanation mentioned above for the [tak.tu.bun.na] vs. [ma:d.dun] contradiction, i.e., that the geminate in [ma:d.dun] is derived through syncope (/ma:did+un/ [ma:d.dun]), while in the ungrammatical example (7d), the geminate is underlying. This may indicate that the vowel deletion in [ma:d.dun] applies after the grammar of CA has already checked that there are no CVVC syllables. In other words, from a rule-based phonology perspective, in CA there are two phonological processes that are crucially ordered; the vowel shortening of long vowels in potential CVVC syllables in examples such as /taktub+u:+nna/ must precede the deletion of the short vowel falling between the two identical consonants in /ma:did+un/. Thus, vowel shortening does not apply to /ma:did+un/, and therefore, it surfaces with a super-heavy syllable which happens to be ending

with a geminate. It would seem that in the same way, we can explain the rarely occurring CVCC_rC_r syllabic structure, e.g. [ʃu.wayb.ba.tun] in (4), in which the final geminate is also derived. In this case, we can say that the vowel epenthesis process must have taken place before the final geminate is derived by vowel deletion. Thus, the super-heavy syllable escapes the process that would break up its final cluster. But this analysis will not explain the metathesis process that happens in examples such as /yamdudu/ [ya.mud.du] (see (9a) above). If we applied the same phonological operations to this example, i.e., avoiding super-heavy syllables first, then deleting the first vowel of a -C_rVC_rV sequence, the output of /yamdudu/ would be *[yam.du] and not the grammatical output [ya.mud.du]. Therefore, we can assume that CA resorts to metathesis first as a means to prevent -C_rVC_rV structures, and if this is not possible, then syncope takes place.

This may support Al-Shayib's (2004) claim that the surface representation of /ʃuwaybibatun/ is [ʃu.wa.yib.ba.tun] and not [ʃu.wayb.ba.tun]. This means that [ʃu.wa.yib.ba.tun] has undergone metathesis just like [ya.mud.du]. It is still possible, however, that Al-Shayib (2004) is incorrect with regard to /ʃuwaybibatun/ and that the correct output is after all [ʃu.wayb.ba.tun] with a medial super-heavy syllable. We must, in this case, explain the distinction between the occurrence of a super-heavy syllable in [ʃu.wayb.ba.tun] but not in *[yam.du]. One explanation can be that in CA, CVCC syllables in which the second consonant is a semi-vowel are somehow less prohibited than those in which the same consonant is

an obstruent. A more salient account, however, is that /ʃuwaybibatun/ does in fact undergo metathesis (hence, ʃuwayibbatun), but because CA prefers neither a sequence of semi-vowel+vowel with both segments having identical features⁹ (in this case /y/ and /i/ are both high, unrounded sounds) nor diphthongs, the vowel /i/ deletes and the word surfaces with the super-heavy syllable.

The notion of abstract underlying and intermediate and phonetic representations is an essential element in the traditional analyses of CA phonology. We already encountered some instances in which early Arab scholars account for phonological aspects of CA with reference to different levels of representations. The term they use to refer to underlying representations is *al-ʔaʃl* 'the origin'. Al-Khalil, for example, stated that the *hamzatu l-waʃl* /ʔV/ is not part of the "original form" of words to which this syllable is phonetically prothesized (Al-Shayib, 2004, p. 105). In addition, Arab linguists regularly indicated that the CVVC_rC_r syllabic structure in some words is "originally" CVVC_rVC_rV. Moreover, Sibawayhi referred to an intermediate stage in the conjugation of the second person, plural, masculine imperative from the verb *rama*: /rmi:+u:/ [ʔir.mu:], in which the initial *hamzatu l-waʃl* is added before the deletion of the vowel /i:/. The following is a summary of Sibawayhi's analysis of this conjugation. To avoid *iltiqāʔ as-sākinayn* word initially, *hamzatu l-waʃl*, /ʔV/, is attached to the beginning of the word. In this case the short vowel of the prosthetic /ʔV/ must be

⁹ This is true except in one condition, namely, when the semi-vowel is part of a geminate, e.g., [say.yidun].

in correspondence with the first underlying vowel in /rmi:+u:/ in the feature [round], hence it is [i]. Afterward, the long vowel /i:/ is deleted to prevent the consecutive long vowels /i:+u:/ from surfacing and causing *iltiqāʔ as-sākinayn*, which yields [ʔir.mu:]. If we were to choose the prosthetic /ʔV/'s vowel quality based on the first vowel in the output we would have produced an incorrect verb, *[ʔur.mu:] (Sibawayhi, 1975, v. 4, p. 156).

Some basic concepts of lexical phonology can be found in traditional works on CA phonology. The lexicon plays a crucial role in this theory, a theory that is based on the interaction of morphology and phonology and assumes that phonological rules fall into two classes based on morphological information, lexical phonology (applies only within words) and post-lexical phonology (applies anywhere but after lexical phonology). In their explanation of several phenomena in CA, Arab grammarians referred to the morphological nature of components from which words are composed. For example, ancient Arab scholars clarified why in example (17) the long vowel of the indicative verb shortens in the jussive, while in the phrase in (18) it also shortens even though if it were to remain long it would not create a non-final CVVC syllable due to the epenthetic vowel.

(17) /yana:mu/ INDICATIVE
[ya.na:.mu]
/yana:m/ JUSSIVE [ya.nam]

(18) /yana:m lwaladu/ JUSSIVE
[ya.na.mil.wa.la.du]
*[ya.na:.mil.wa.la.du]

Sibawayhi stated that *iltiqāʔ as-sākinayn*, the vowel /a:/ followed by the consonant

/m/ in (18), is prevented from surfacing because it would take place within a word given that the vowel /i/ is epenthetic and is not part of the word [[yana:m]_w lwaladu] (Sibawayhi, 1975, v. 4, p. 158). In other words, the vowel shortening and the vowel epenthesis processes take place at two different morphological levels. A similar example of a traditional analysis that is in line with the theory of lexical phonology is Ibn Jinni's explanation of the distinction between examples (19) and (20) below. If the long vowel in (19) were to remain long, the outcome of (19) would be similar to that in (20) in which the utterance-final CVVC syllable is allowed to surface; but this is not the case. According to Ibn Jinni, the vowel is shortened at the word level in (19), a level at which no CVVC is allowed, whereas the super-heavy syllable CVVC surfaces without undergoing vowel shortening in (20) because it is created beyond the word level grammar; namely, when the word-final vowel deletes at the utterance level (Ibn Jinni, 1970, v. 1, p. 60).

(19) /yana:m/JUSSIVE [ya.nam]#

(cf. /yana:mu/INDICATIVE
[ya.na:.mu]#)

(20) /yana:mu/ ----- [ya.na:m]##
(cf. /yana:mu lwaladu /
[ya.na:.mul.wa.la.du])

The concept Sibawayhi exploits to explain the variation in producing /mdud/IMPERAT between Ahl Al-Hijaz [ʔum.dud] and Banu Tamim [mud.da] is parallel to the theory of output-to-output correspondence. The variant of Ahl Al-Hijaz, according to Sibawayhi, is the predicted output for /mdud/, whereas Banu Tamim's pronunciation resembles an

already existing output (Sibawayhi, 1975, v. 3, p. 529; and see 3.3 above).

Traditional sources on CA provide a precise description of its sound system including the distinction between long and short vowels and between vowels and semi-vowels. Nevertheless, this distinction is not reflected in the phonological accounts early Arab linguists gave for certain phonological aspects of CA. Rather, they relied on the orthographical aspect of the language presumably for pedagogical reasons. It is fair to excuse the pioneer Arab grammarians for any shortcomings in their phonological studies of CA. But the burden of improving these studies falls on scholars of subsequent generations who barely made any radical modifications to previous studies on CA phonology and often repeated the exact words of early Arab linguists. Some of the analyses by early Arab linguists such as Sibawayhi, Ibn Ya'ish, and Ibn Jinni would have been a perfect starting point for further improvement in Arabic phonological studies had subsequent scholars advanced early observations and remarks and composed works concentrating exclusively on phonology. But it is unfortunate that such advancements did not take place. It was not until the nineteenth and early twentieth century A.D. that orientalist and Western scholars started to analyze CA from a modern linguistic point of view and Arab scholars began adopting such views in the last 50 years.

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