ARTICLE

Vowel Shortening and Resyllabification in Quranic Arabic

Mohammed Nour Abu Guba [1] , *Abdallah Abu Qub'a* [2*]

[1] *English Language Institute, University of Sharjah, Sharjah University City, Sharjah 27272, United Arab Emirates*

[2] *English Language Center, King Faisal University, Hofuf, Al-Ahsa 31982, Saudi Arabia*

ABSTRACT

Vowel shortening and resyllabification are common phonological processes in Arabic dialects. However, these processes are less common in Standard Arabic, and they are expected to be the least common in Quranic Arabic, which represents Classical Arabic. This is because Quranic Arabic needs to be pronounced clearly and enunciatively as dictated by Quranic recitation rules. In this study, we shed new light on these processes by analyzing vowel shortening and resyllabification in Quranic Arabic. Data comes from four chapters in the Holy Quran, namely Chapter 38 (Sad), Chapter 44 (Al-Duxan), Chapter 50 (Qaf), and Chapter 68 (Al-Qalam). The analysis of 2427 words that are made up of 4549 syllables shows that the two processes of vowel shortening and resyllabification are common phonological processes even in Classical and Quranic Arabic. Results show that these processes are invoked to avoid CVVC syllables, which are marked phrase internally. Arabic here resorts to shortening the long vowel yielding a bimoraic syllable, which is unmarked. Moreover, results confirm that the definite article in Arabic is underlyingly /l/ only. The connecting hamza in the definite article and elsewhere is invoked to avoid CC complex onsets phrase internally and vowel epenthesis is induced to preclude complex onsets when a vowel is not present. It is concluded that these processes represent universal linguistic principles that are driven by economy of effort and markedness.

Keywords: Classical Arabic; Connecting Hamza; Quranic Arabic; Resyllabification; Vowel Shortening

1. Introduction

Quranic Arabic represents classical Arabic, which is the most elevated form of Arabic. Quranic Arabic represents the oral form of Classical Arabic that dates back to the seventh century A.D. It has been transmitted orally from one generation to another over the last fourteen centuries [1]. Quran recitation is governed by special rules to ensure it is clearly pronounced and enunciated where each phoneme is fully articulated with the articulators achieving the ideal articulatory position for each sound (Elhadj et al. [2]; Alagrami & Eljazzar 2020 [3]). This type of recitation is very crucial to maintain the Quran as it has been revealed to the prophet Mohammed via the angel Grabriel [4].

The careful and enunciative articulation of the Quran entails that common phonological processes that abide in connected speech in modern Arabic dialects such as vowel shortening and resyllabification (i.e., a consonant becomes attached to a syllable that is different from the one from which it originally came) are not expected to occur as these variations may affect the clarity of pronunciation—the ultimate target of any Quranic recitation. This paper seeks to demonstrate that these processes are very common in Quranic Arabic and therefore they represent universal phonetic principles. In other words, the existence of these processes lends support to their naturalness and universality, which is rooted in ease of articulation and economy of efforts.

The main objective of this study is to account for vowel shortening and resyllabification in Quranic Arabic. The study will analyze all cases in a sample of four chapters in the Holy Quran. By doing so, it aims to uncover the underlying linguistic factors that invoke these processes. Such an inquiry not only enhances our understanding of Quranic phonology but also contributes to the broader field of Arabic linguistics. Studying these processes is important as they play a critical role in the rhythm and prosody of the language. Such a study will also provide a deeper understanding of the phonological rules governing the recitation of the Quran, ensuring the preservation of its oral tradition, besides shedding light on how phonological processes in Classical Arabic differ from or align with those in modern Arabic dialects, which appear to be very different from Classical Arabic. More specifically, this study will attempt to answer the following questions: 1) How common are vowel shortening and resyllabification in the recitation of Quranic Arabic? 2) What phonological factors lie behind these processes?

By addressing these questions, this research aims to contribute to the understanding of phonological phenomena in Quranic Arabic, providing a framework for future studies in Arabic linguistics and Quranic studies. It will also establish the universality and unmarkedness of such phonological processes.

The rest of the paper is organized as follows. In Section 2, we review the literature on vowel shortening in Arabic dialects and Standard Arabic and identify the gap in the literature. In Section 3, we give information on the methodology used to collect the data from four chapters in the Holy Quran. We analyze and discuss the environments where vowel shortening, vowel deletion, and resyllabification apply in Section 4, demonstrating that these phonological processes are invoked to avoid trimoraic syllables and to eliminate complex onsets. Finally, in Section 5, we conclude with some implications that highlight the universality of these processes in world languages.

2. Background: Vowel Shortening in Arabic

Vowel shortening in Arabic dialects and to a lesser extent in Standard Arabic is a common linguistic phenomenon whereby long vowels or diphthongs are shortened for phonological, morphological, or prosodic reasons. Long vowel shortening affects unstressed long vowels internally and word-finally (e.g., Abu-Salim [5]; Abu Guba [6]). For example, In Jordanian and Palestinian Arabic /katab + u:/ (wrote - they) is realized as *katabu* 'they wrote', (the sign ː is used to stand for long vowels) while the same long vowel does not undergo shortening if it is not word final, as in /katab + uː + ha/ (wrote – they - it), which is realized as *katabuːha* 'they wrote it' (Abu-Salim [5]; Abu Guba [6]). Unstressed long vowels are also shortened word internally in pretonic position, i.e., when they precede stressed syllables, as in /kitab + eːn (book -dual morpheme), which is realized as *ktabeːn* 'two books' in Jordanian and Palestinian Arabic (Abu Guba [6]). In these two cases, vowel shortening can be linked to markedness in that long vowels tend not to occur in weak positions. That is, unstressed syllables represent weak positions and therefore long vowels undergo lenition (weakening) in this place yielding short vowels, an output that is less marked

(see Gordon[7]). Marked outputs are those that are less natural, less common, more complex. and harder to articulate (Rice,[8]). Moreover, long vowel shortening word internally can be related to stress and rhythm where shortening avoids a clash in adjacent syllables. To explain, long vowels in Arabic represent heavy syllables that receive stress and therefore the presence of two long vowels in two successive syllables will result in two stressed syllables in a row. Shortening the long vowel will render the syllable weak and therefore unstressed, hence avoiding a stress clash.

Another case of vowel shortening relates to syllable binarity. Binarity is determined by the type of vowel and the presence of coda consonants in the syllable. A short vowel contributes one mora, which is a phonological weight unit. A long vowel (diphthongs are also counted as long vowels) has two moras, and a coda consonant contributes to weight by adding another mora unless it is in word final position where it is extrametrical, i.e., it does not contribute to weight (Hayes[9]; Farwaneh[10]; Watson[11]). Therefore, a syllable with a short vowel is monomoraic, a syllable with a short vowel followed by a coda is bimoraic (i.e. it contributes two weight units), while a syllable with a long vowel or a diphthong is bimoraic. Arabic prefers syllables to be bimoraic, i.e., an optimal syllable in Arabic has a long vowel without a coda consonant, or it has a short vowel with a coda (Broselow[12]; Hayes[9]; Abu Guba[13, 14]). Arabic dialects try to avoid these trimoraic CVVC syllables by adopting different strategies. Some dialects resort to vowel epenthesis by rendering the final consonant as an onset, for example in Makkan Arabic, /kita:b + na/ (book -our) is realized as *kita:bana* 'our book', where the short vowel /a/ is inserted after the syllable with a long vowel rendering the coda /b/ in onset position of the new syllable.

Other dialects such as Egyptian Arabic and Jordanian Arabic (at the lexical level) apply vowel shortening which takes away one mora from the long vowel. To illustrate, in Jordanian Arabic /ʃa:f +na/ 'see -we' is realized as *ʃufna* 'we saw' where the long vowel is shortened (besides vowel raising) to avoid a trimoraic syllable. In Egyptian Arabic, /kita:b +na/ (book -our) surfaces as *kitabna* 'our book', where the long vowel in the second syllable shortens, which renders the syllable bimoraic (Broselow[15]). Still, other dialects (such as Levantine Arabic dialects) resort to mora sharing where the second leg of the vowel and the coda share one mora

(Broselow[15]). Broselow, Chen, Huffman, and Hsieh[16] and Watson[17] brought acoustic evidence for the bimoraicity of word internal CVVC syllables. They reported that long vowels and codas in CVVC syllables word internally were significantly shorter than their counterparts in other environments.

Another case of vowel shortening in Modern Standard Arabic denotes vowels in polysyllabic words. This is a case of phonetic, rather than phonological, shortening that represents a universal phonetic feature that applies in all languages in different degrees. Abu Guba, Mashaqba and Huneety[18] demonstrated that long vowels in polysyllabic words as in *xa:lak* 'your uncle' and *xa:lana* 'our uncle' are significantly shorter than the long vowel in the monosyllabic word *xa:l* 'uncle'. This phonetic vowel shortening is beyond the scope of this paper.

Turning to resyllabification in Arabic, this phenomenon refers to the process of reorganizing syllable boundaries within words or across word boundaries during speech. This phonological process, which is common in spoken Arabic dialects, is invoked to maintain optimal syllable structure or to facilitate articulation. It is common across word boundaries where one word ends with a consonant and the next word begins with a vowel. The final consonant attaches to the initial vowel of the following word in connected speech as in /min ismu/ 'from his name' which is realized as *minis mu* and in /ʔiʃtara: ʔal- ʕalam/ 'he bought the flag', which is realized in most Arabic dialects as *ʃtaral ʕalam* where the lateral consonant of the definite article /l/ is resyllabified as a coda of the previous syllable after the deletion of the glottal stop and the short vowel. This phenomenon will be thoroughly examined in Quranic Arabic, which is always expected to be pronounced clearly and enunciatively.

The definite article in Arabic has a special status: syntactically it is part of the following noun or adjective, while phonologically it is encliticized to the preceding prosodic word (Watson[19]). It also undergoes anticipatory assimilation where it assimilates completely to the following consonant if it is a coronal while it is realized as is if the following consonant is a non-coronal (Watson[19]). The underlying form of the definite article is still debated in Arabic linguistics (Daoud,[20]). Some researchers, e.g., Al Khalil[21] and Bishr[22] argue that it is *-ʔal*; others, e.g., Hassan[23] and Heselwood and Watson[24] postulate that it is *-al*, while oth-

ers, e.g., Sibawayh[25] and Ibn Jinni[26] think that it is only -*l* (see Daoud[20] for a summary). The findings of this study will contribute to solving this issue.

Hamzat al-Wasl (literally a connecting glottal stop) is a glottal stop with a vowel that is inserted to avoid complex onsets in Arabic as Standard Arabic does not allow complex onsets categorically, a marked output that is at odds with ease of production (cf. Ibn Jinni[26]; Bishr[22]; Al-Farahidi[27]; Baraka[28]; Watson[19]). To explain, if a word starts with a complex onset (due to concatenation resulting from morphological processes), vowel prothesis applies to break up the complex onset, yielding -iCC (C refers to a consonant). This form is still ill-formed in Arabic as onsetless syllables are not allowed. Therefore, the glottal stop is inserted to provide an onset to the new syllable (Watson[19]). For example, the imperative form of the root verb q, r, ʔ'to read' is /qraʔ/. This is ill-formed due to the complex onset; a vowel is inserted yielding /iqraʔ/, which is still unaccepted and therefore a glottal stop is inserted yielding *ʔiqraʔ* 'read' (see Younes[29]). This process is also attested with the definite article, whose citation form is -ʔal. It also occurs in a dozen of nouns such as *ʔɪbɪn* 'son, *ʔɪθnein* 'two', *ʔɪsɪm* 'name, noun'. It also appears in certain imperative verbs, e.g., those derived from forms I, IV, VII, VIII and IX, as in *ʔudrus* 'study', *ʔinsaħib* 'retreat', and *ʔirtad͡ʒil* 'improvise'. It also occurs in past tense verbs of forms VII, VIII, IX and X such as *ʔistaxrad͡ʒ* 'he extracted' and their corresponding verbal nouns, as in *ʔistixra:d͡ʒ* 'extraction' (Younes[29]; Wright & Caspari[30]).

When such words are preceded by other words phrase/utterance internally, the Hamzat al-Wasl drops. For example, when proclitics such as the conjunctions *wa* 'and' or *fa* 'then', or prepositions like *li* 'to/for' precede these words, the Hamzat al-Wasl drops, as in /wa -ʔudrus/ 'and study', which is realized as *wudrus* where the glottal stop and the vowel are elided as the word with the Hamzat al-Wasl is no longer in phrase/utterance initial position.

Another type of hamza in Arabic is called Hazmat al-Qatˤ, a non-connecting glottal stop that is always pronounced wherever it occurs in the word. This is a phonemic sound where the glottal stop constitutes one of the radicals in the word and therefore it is never elided. It appears in all positions of the word, at the beginning (e.g., *ʔakala* 'he ate'), in the middle (e.g., *saʔala* 'he asked'), or at the end of a word (e.g., *ʃayʔ* 'a thing').

No study has been devoted to the analysis of such phonological processes in Quranic Arabic. This paper aims to investigate these processes in Quranic Arabic that is assumed to pay extra attention to clarity and enunciation. The existence of these processes in Quranic Arabic would confirm that such processes are universal and natural.

3. Methodology

Data for this paper comes from four chapters in the Holy Quran, namely, Chapter 38 (Sad), Chapter 44 (Al-Duxan), Chapter 50 (Qaf), and Chapter 68 (Al-Qalam). These were selected based on convenience sampling, as they are part of a large study project. The first researcher went over all the words in the four chapters and identified all cases of vowel shortening and resyllabification. These were analyzed according to the reasons invoking them. This was verified by the second researcher, and no discrepancies were found. Chapter Sad consists of 88 verses and the total number of words is 1408 with 1902 syllables. Chapter Al-Duxan consists of 59 verses and the total number of words is 346 with 889 syllables. Chapter Qaf has 45 verses, with a total number of 373 words that are made up of 954 syllables, while Chapter Al-Qalam comprises 52 verses, corresponding to 300 words with 804 syllables (Abu Guba, Abu Qub'a & Daoud, forthcoming[31]).

4. Results and Discussion

The analysis of the 4549 syllables in the 2427 words in the four chapters shows that the two phonological processes (vowel shortening and resyllabification) are very common in Quranic Arabic. They appear 91 times in Chapter 38, 40 times in Chapter 44, 42 times in Chapter 50, and 20 times in Chapter 68. All these cases apply only when a connecting hamza (Hamzat al-Wasl) follows. Most cases relate to the definite article. For ease of exposition, we first present the cases involving the definite article and then present all other cases.

4.1. Phonological Processes Involving the Definite Article

Like Arabic dialects (e.g., Watson[19]; Salem[32]), Quranic Arabic deletes the glottal stop and the vowel in

the definite article across word boundaries. The definite article's citation form is -ʔal and this appears phrase/utterance initially. In connected speech where the definite article is not in phrase/utterance initial position, the glottal stop and the following vowel are elided and resyllabification applies, as shown in (1). This is accompanied with regressive assimilation of the lateral sound /l/ to the following coronal sound resulting in a geminate, as in (1a) and without assimilation, as in (1b).

(1) Vowel and glottal stop deletion and resyllabification with the definite article

   a. With /l/ assimilation

   عليهم السماء ʕalayhumu ʔal sama:ʔi /on -they -the -sky/ (44: 29) > ʕalayhumus sama:ʔi 'the sky on them' (Chapter 00:0).

   عن الشمال ʕani ʔal ʃima:l /from -the -left/ (50: 17) > ʕaniʃ ʃima:l 'on the left'

   خشيى الرحمن xaʃiya ʔalraħma:n /fear-past -the- compassionate/ (50: 33) > xaʃiyar raħma:n 'feared the compassionate'

   طلوع الشمس tˤuluːʕi ʔal ʃams /rise -the -sun/ (50: 39) > tˤuluːʕiʃ ʃams 'the sunrise'

   أدبار السجود ʔadba:ra ʔal sud͡ʒa:d / back-plural -the -prostration/ (50: 40) > ʔadba:ras sud͡ʒu:d 'the backs of those who prostrate'

   b. Without /l/ assimilation

   حب الحصيد ħabba ʔal ħasˤiːd /grain – the- harvest/ (50: 9) > ħabbal ħasˤiːd 'the grain of the harvest'

   يوم الخلود jawmu ʔalxulu:d /day -the -eternity/ (50: 34)> jawmul xulu:d 'the day of eternity'

   عن اليمين ʕan ʔal jami:n /from -the -right/ (50: 17) > ʕanil jami:n 'on the right'

   أزلفت الجنة ʔuzlifat ʔal d͡ʒanna /bring near -past- passive -the -paradise/ 50: 31) > ʔuzlifatil d͡ʒanna 'paradise was brought near'

   واترك البحر watruk ʔal baħra /and – leave -imperative - the- sea/ (44: 24) > watrukil baħra 'let go the sea'

In the examples in (1a), the glottal stop and the vowel following it are elided, and the lateral consonant /l/ undergoes complete assimilation to the coronal consonant following it. The assimilated sound is resyllabified as a coda of the preceding vowel. The second example (ʕaniʃ ʃima:l) further

confirms that the glottal stop and the vowel are not underlying because the vowel /i/ that comes after the preposition ʕan 'from' is an epenthetic vowel, which is inserted to break up the three consonant cluster -nlʃ. Further evidence that the glottal stop and the vowel of the definite article are not underlying in Arabic comes from the fact that vowel epenthesis is not invoked in two consonant clusters. Two consonant clusters at word boundaries abound in Arabic, as in *hum ʔaʃadu* (Chapter 50: 36) and *biman dˤall* (Chapter 68: 7) and no vowel epenthesis is called for. If the glottal stop and the vowel were underlying, there would be a two consonant cluster in *ʕan ʔaʃ ʃima:l and therefore no vowel epenthesis would be needed to break up the cluster -nʔ.

In the examples in (1b), the same processes in (1a) occur except for /l/ assimilation. Here, the lateral sound does not assimilate because it is followed by a non-coronal consonant whose place of articulation is far from the coronal /l/; hence assimilation is blocked. To illustrate, in /ħabba ʔal ħasˤiːd/, the glottal stop and the vowel following it are deleted, the stranded consonant /l/ is attached to the preceding syllable whose coda position is vacant yielding *ħabbal ħasˤiːd*. Again, the last two examples in (1b) (cf. ʔuzlifatil d͡ʒanna) confirm that the definite article is underlyingly /l/ only and the vowel /i/ is inserted to break up the cluster. If the underlying form of the definite article was -al as assumed by Heselwood and Watson[24], hiatus would result in most cases as in /jawmu alxuluud/. This would require vowel deletion to repair hiatus, giving *jawmul xuluud*. However, postulating that the underlying form is -al (with a vowel) is at odds with cases such as /ʔuzlifat ʔal d͡ʒanna/, which surfaces as *ʔuzlifatil d͡ʒanna*, with /a/ deletion and insertion of the epenthetic vowel /i/ after the last consonant in the first word. Had the vowel been underlying in the definite article, there would have been no need to resort to vowel epenthesis. These findings corroborate Sibawayh's[25], Ibn Jinni's[26], and Daoud's[20] opinions that the definite article is only /l/.

4.2. Long Vowel Shortening, Glottal Stop Deletion, Vowel Deletion, and Resyllabification

Other common processes that relate to the definite article involve long vowel shortening besides the other phonological processes in Section 4.1 above. Again, these processes happen with and without /l/ assimilation, as illustrated in (2).

(2) Long vowel shortening, glottal stop deletion, vowel deletion, and resyllabification

a. With /l/ assimilation

ذي الذكر ðiː ʔal-ðikr /that -the -remembrance/ (38: 1) > ðið ðikr 'the possessor of the remembrance'

خلقنا السماء xalaqnaː ʔal-samaːʔi /created -we -the -sky/ (38: 28) > xalaqnassamaːʔi 'we created the sky'

في الصور fiː ʔal-sˤuːr /in -the -trumpet/ (50: 20) > fisˤ sˤuːr 'in the trumpet'

صالو النار sˤaːluː ʔal-naːr /burn -they -the -fire/ (38: 59) > sˤaːlun naːr 'they will burn in the fire'

يغشى الناس jaɣʃaːʔal-naːs /cover -singular -the -people/ (44: 11) > jaɣʃan naːs 'it covers the people'

b. Without assimilation

خلقنا الإنسان xalaqnaː ʔal-ʔinsaːna /create -past – we- the -human/ (38: 27) > xalaqnal ʔinsaːna 'We created the human'

في البطون fiː ʔal-butˤuːn/ in -the -abdomen- plural/ (44: 45) > fil butˤuːn 'in the abdomens

كاشفوا العذاب kaːʃifuː ʔal-ʕaðaːb /remove -we -the -torment/ (44: 15) > kaːʃiful ʕaðaːb 'we will remove the torment'

ينادي المنادي junaːdiː ʔal-munaːdi /call -he – the -caller/ (50: 41) > junaːdil munaːdi 'the caller calls'

إلينا المصير ʔilajnaː ʔal-masˤiːr /to -us -the -destination/ (50: 43) > ʔilajnal masˤiːr 'to us is the destination'

In the examples in (2) above, the long vowel in the first word is shortened, the glottal stop and the short vowel of the definite article are deleted, and the /l/ of the definite article assimilates to the following consonant in (2a) or realized as is in (2b), and it is resyllabified as a coda of the previous syllable. If the vowel did not shorten, the syllable would be of the type CVVC. This syllable seems to be marked phrase/utterance internally in Arabic and therefore vowel shortening applies and the stray (unsyllabified) consonant syllabifies as a coda in the preceding word resulting in a CVC syllable, which is less marked. These findings are similar to those reported in Abu Guba, Jarbou & Abu Qub'a[33] where long vowels in function words in Modern Standard Arabic are shortened before the definite article. These processes further demonstrate that the underlying form of the definite article

is /l/ and the syllable with a long vowel and a coda phrase internally is marked.

4.3. Other Environments

The processes presented above do not apply only to the definite article; rather, these processes are post-lexical rules that apply across the board whenever a connecting hamza (Hamzat al-Wasl) is present. Postlexical rules are those that apply to the output of the lexical level after the application of all lexical and syntactic rules, which operate within the lexicon (Gussenhoven & Jacobs[34]).

Connecting hamza (the glottal stop and the vowel) deletion as well as long vowel shortening and resyllabification occur in verbs and nouns, as in (3).

(3) Connecting hamza deletion, long vowel shortening, and resyllabification with verbs and nouns

هل امتلأت hal ʔimtalaʔti /have – fill -past -passive -you/ (50: 30) > halim talaʔti 'have you been filled?'

أن اغدوا ʔan ʔiɣdu: /that -you -go forth -plural/ (68: 22) > ʔaniɣ du: 'that you go forth'

إبليس استكبر ʔibliːsa ʔistakbara /Satan -act arrogantly -past/ (38: 74) > ʔibliːsas takbara 'Satan acted arrogantly'

أن امشوا ʔan ʔimʃu: /that – walk -you -plural/ (38: 6) > ʔanim ʃu: 'that you walk'

ربنا اكشف rabbanaː ʔikʃif /Lord -our -remove/ (44: 12) > rabbanak ʃif 'our Lord, remove'

ربي اغفر rabbiː ʔiɣfir /Lord -my -forgive/ (38: 35) > rabbiɣ fir 'my Lord, forgive'

In the first example in (3), the verb starts with a complex onset underlyingly //mtalaʔti//. This necessitates the insertion of a vowel to break up the complex onset yielding *imtalaʔti. This is still ill-formed because it has an onsetless syllable, which is categorically forbidden in Arabic. Therefore, a glottal stop is inserted. However, in connected speech the glottal stop and the vowel following it are deleted as they are not underlying (hal mtalaʔti). The output has a three consonant cluster and therefore vowel epenthesis is invoked to eliminate the cluster. The best epenthetic site here is after the first consonant where the stranded consonant (the unsyllabified one) surfaces in coda position (see Kiparsky[35]; Abu Guba, Abu Qub'a, Mashaqba, Hneety, & Al-Deaibes, in

press [36]). The last two examples in (3) are examples of glottal stop and vowel deletion besides long vowel shortening, which is invoked to eliminate internal CVVC syllables.

Note that these processes do not apply with phonemic hamza as in /*balawna: ʔasˤħa:ba*/, which is realized as *balawna: ʔasˤħa:ba* 'we tested the owners', without shortening or deletion. There is no shortening because the syllable with the long vowel is bimoraic as the consonant following it is realized as an onset of the following vowel. Also, in *lakum ʔajma:nun* 'you have oaths', the initial hamza in the second word does not elide as it is phonemic. Note also here that there are two consonants at the word boundaries and no vowel epenthesis is invoked.

5. Conclusions

This paper has accounted for vowel shortening and resyllabification in Quranic Classical Arabic, which is not expected to exhibit these two processes given that clear and enunciated articulation have paramount importance in the recitation of the Holy Quran. It has been established that these two processes are not only common in Arabic dialects but also in Quranic Arabic. These processes are incurred to fix ill-formed prosodic structure that results from the concatenation of morphemes. They happen mainly to break up complex onset clusters and to avoid CVVC syllables phrase internally. Results pinpoint that these processes that apply in Quranic Arabic and all varieties of Arabic are natural phonological processes driven by economy of effort and markedness, which reflects the vital role these principles play in language processing. These processes are not restricted to certain morphemes such as the definite article, but they apply to all non-phonemic connecting glottal stops (hamzas). Results confirm that the definite article in Arabic is only -l, and it cannot be -al or -ʔal, as assumed by previous work. Moreover, it has been demonstrated that internal CVVC syllables are marked in Arabic. Arabic resorts to long vowel shortening and resyllabification to produce the more preferred CVC syllable type. Findings show that Quranic Arabic follows language universals, and it is like other Arabic dialects in that it avoids marked phonological structures such as complex onsets and CVVC syllables word internally.

One limitation of this study relates to its corpus. Although a corpus of four chapters is representative, it is preferable to analyze more chapters in the Holy Quran to corroborate the findings of this study. Therefore, future research should examine more cases of these processes in the Holy Quran with a focus on the distribution and frequency of CVVC syllables. Note that there is no bias in the sample selection as the authors selected these four chapters as they had already been working on other aspects of these four chapters not because of the existence of such processes or not. Also, it is recommended to examine such syllables in Arabic dialects to form a complete picture about the status of these syllables in Arabic.

Author Contributions

Conceptualization, M.N.A.G.; methodology, M.N.A.G.; software, M.N.A.G.; validation, M.N.A.G.; formal analysis, M.N.A.G.; investigation, M.N.A.G.; resources, A.A.Q.; data curation, M.N.A.G.; writing—original draft preparation, M.N.A.G.; writing—review and editing, M.N.A.G.; visualization, M.N.A.G.; supervision, A.A.Q.; project administration, M.N.A.G.; funding acquisition, A.A.Q. All authors have read and agreed to the published version of the manuscript.

Funding

Institutional Review Board Statement

Ethical approval was not required as the study did not involve human participants.

Informed Consent Statement

No human subjects are involved in this study.

Data Availability Statement

Data are available upon request.

Acknowledgments

Conflicts of Interest

The authors declare no competing interests.

References

[1] Dweirj, L., 2023. The Qur'an: An oral transmitted tradition forming Muslims habitus. Religions. 14(12), 1531. DOI: https://doi.org/10.3390/rel14121531

[2] Elhadj, Y.O., Aoun-Allah, M., Alsughayeir, I.A., et al., 2012. A new scientific formulation of Tajweed rules for E-learning of Quran phonological rules. International Journal of Islamic Applications in Computer Science and Technology. 1(1), 1–10.

[3] Alagrami, A.M., Eljazzar, M.M., 2020. Smartajweed: Automatic recognition of Arabic Quranic recitation rules. arXiv. DOI: https://arxiv.org/abs/2101.04200

[4] Salahi, A., 2019. The Qur'an: A Translation for the 21st Century. Islamic Foundation: Leicestershire, UK.

[5] Abu-Salim, I., 1982. A reanalysis of some aspects of Palestinian Arabic: A metrical approach [Unpublished Ph.D. Thesis]. Champaign, IL, USA: University of Illinois.

[6] Abu Guba, M.N., 2016. Phonological adaptation of English loanwords in Ammani Arabic. University of Salford: Salford, UK.

[7] Gordon, M., 2011. Stress: Phonotactic and phonetic evidence. In: van Oostendorp, M., Ewen, C., Hume, E., et al., (Eds.). The Blackwell companion to phonology. Wiley-Blackwell: Malden, MA, USA; Oxford, UK. pp. 924–948.

[8] Rice, K., 2007. Markedness in phonology. In: de Lacy, P. (Ed.). The Cambridge Handbook of Phonology. Cambridge University Press: Cambridge, UK. pp. 79–98.

[9] Hayes, B., 1995. Metrical stress theory: Principles and case studies. University of Chicago Press: Chicago, IL, USA.

[10] Farwaneh, S., 2009. Toward a typology of Arabic dialects: The role of final consonantality. Journal of Arabic and Islamic Studies. 9, 82–109.

[11] Watson, J., 2011. Word stress in Arabic. In: van Oostendorp, M., Ewen, C., Hume, E., et al., (Eds.). The Blackwell companion to phonology. Wiley-Blackwell: Malden, MA, USA; Oxford, UK. pp. 2990–2918.

[12] Broselow, E., 1992. Parametric variation in Arabic dialect phonology. In: Broselow, E., Eid, M., McCarthy, J. (Eds.). Perspectives on Arabic linguistics IV. John Benjamins: Amsterdam, The Netherlands; Philadelphia, PA, USA. pp. 7–45.

[13] Abu Guba, M.N., 2018. Stress assignment in polysyllabic words in Levantine Arabic: An Optimality-Theoretic analysis. Lingua Posnaniensis. 60(2), 7–24. DOI: https://doi.org/10.2478/linpo-2018-0009

[14] Abu Guba, M.N., 2021. Consonant gemination within English loanwords in Ammani Arabic: An Optimality-Theoretic analysis. Journal of Linguistics. 57(1), 1–38. DOI: https://doi.org/10.1017/S0022226720000183

[15] Broselow, E., 2018. Syllable structure in the dialects of Arabic. In: Benmamoun, E., Bassiouney, R. (Eds.). The Routledge handbook of Arabic linguistics. Routledge: London, UK. pp. 32–47.

[16] Broselow, E., Chen, S., Huffman, M., et al., 1995. The timing structure of CVVC syllables. In: Eid, M. (Ed.). Perspectives on Arabic Linguistics VIII. John Benjamins: Amsterdam, The Netherlands; Philadelphia, PA, USA. pp. 119–138.

[17] Watson, J., 2007. Syllabification patterns in Arabic dialects: long segments and mora sharing. Phonology. 24(2), 335–356.

[18] Abu Guba, M.N., B. Mashaqba, S., Huneety, A., 2023. Polysyllabic shortening in modern standard Arabic. Journal of Semitic Studies. 68(2), 759–770. DOI: https://doi.org/10.1093/jss/fgac030

[19] Watson, J., 2002. The phonology and morphology of Arabic. Oxford University Press: Oxford, UK.

[20] Daoud, A., 2010. Dirasaat fi 'ilm Aswaat Al-Arabiyyah (Studies in the science of Arabic Sounds). Dar Jarir: Amman, Jordan.

[21] Al-Khalil, T., 1983. Linguistic analysis of the English loanwords in journalistic Arabic as read by an educated native speaker of Arabic [Master's Thesis]. Yarmouk University: Yarmouk, Jordan.

[22] Bishr, K., 1969. Diraasat fi 'ilm al-lugha [Studies in linguistics]. Daar Al-Ma'aarif.

[23] Hassan, T., 1973. Al-Lugha Al-Arabiya Ma'naha wa Mabnaha (Arabic language: Its meaning and structure). Egyptian Public Book Authority: Cairo, Egypt.

[24] Heselwood, B., Watson, J., 2013. The Arabic definite article does not assimilate. Leeds Working Papers in Linguistics and Phonetics. 18, 34–53.

[25] Sibawayah, A., 1988. Al Kitab (the Book). Revised by Abd Al Salam Haroon. Al Khanji Publishers: Cairo, Egypt.

[26] Ibn Jinni., 1954. Sirr Sina:ʕat l-ʕara:b. First ed. Revised by Mustafa AlSaqqa, Muhammad Al-zafzaf, Ibrahim Mustafa and Abdallah Ameen. Vol I. Mustafa Al-Halabi & Sons Publishers: Cairo, Egypt.

[27] Al-Farahidi, A., 1981. Al-ʕayn (Revised by M. Al-Makhzumi & I. Al-Samirra'i). Dar Al-Rashid Publishers: Fujairah, United Arab Emirates.

[28] Baraka, B., 1988. 'Ilm al-aswaat al-'Aam [General phonetics]. Markaz Al-Inmaa' Al-Qawmi.

[29] Younes, M., 2007. Prothetic vowels. In: Versteegh, K., Eid, M., Elgibali, A., et al., (Eds.). Encyclopedia of Arabic Language and Linguistics. Brill: Leiden, The Netherlands. pp. 728–730.

[30] Wright, W., Caspari, C.P., 2011. A grammar of the Arabic language. Cosimo, Inc.: New York, NY USA.

[31] Abu Guba, M.N., Abu Qub'a, A., Daoud, S.. The phonetics and phonology of single-letter prefixed chapters in the Holy Quran. - in press

[32] Salem, H., 2005. Phonological processes in connected speech in colloquial Egyptian Arabic. In: Alhawary, M.T., Benmamoun, E., (Eds.). Perspectives on Arabic Linguistics XVII–XVIII. Papers from the seventeenth and eighteenth annual symposia on Arabic linguistics. Alexandria, 2003 and Norman, Oklahoma 2004. John Benjamins B.V.: Amsterdam, The Netherlands.

[33] Abu Guba, M.N., Jarbou, S., Abu Qub'a., A., 2022–2023. Levels of prosodic prominence in Arabic: The case of function words. Al-'Arabiyya: Journal of the American Association of Teachers of Arabic. 55–56, 1–36. Available from: https://muse.jhu.edu/article/921321

[34] Gussenhoven, C., Jacobs, H., 2024. Understanding Phonology, 5th Edition. Routledge: London, UK.

[35] Kiparsky, P., 2003. Syllables and moras in Arabic. In: Vijver, C.F. (Ed.). Syllables in Optimality Theory. Cambridge University Press: Cambridge, UK. pp. 147–182.

[36] Abu Guba, M.N., Abu Qub'a, A., Mashaqba, B., et al., The phonetics of vowel epenthesis in Jordanian Arabic. *in press*.