

A Different Treatment of *Qalqalah* Stops Recognition in Arabic

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Abstract

This paper aims to investigate the way a group of stops in Arabic, or more specifically in the Arabic of the Holy Quran (AHQ), is recognized. The stops /b d t d₃ q/ take part in the phenomenon of *qalqalah* which involves vowel insertion (and sometimes a vowel and glottal stop insertion). This process takes place in order to identify this set of stops when they occur word-finally before a pause and word medially as part of a consonant cluster. One of the thorny issues regarding this phenomenon is that the group of sounds that undergoes *qalqalah* comprises voiced as well as voiceless stops. To resolve this problem, some proposals have been put forward. One of these proposals suggests that there is interaction between voicing and emphasis in order to explain the membership of the voiceless / t q/ along with the voiced /b d d₃/ in the class subject to *qalqalah*. The same notion will be used to account for the absence of the voiceless stops /t k/ and the voiced stop /d / from the list. The discussion will also examine other reasons for the exclusion of the stops /t k ʔ/ from the stops contributing to this process in AHQ.

Keywords: Arabic, The Holy Quran, vowel insertion, voicing, *qalqalah*, [±emphatic]

Symbols used in this paper, especially in the names of Arab authors, Arabic books and transcription of Arabic words.

1- Consonants

Symbols in Arabic	Transliteration	Symbols used in phonetic transcription
ء	ʾ	ʔ
ع	‘	ʃ
ط	t	t
ض	dh	d
ق	q	q
ح	h	ħ
خ	kh	χ
غ	gh	ɣ
ظ	z	ð
ص	s	s
ش	sh	ʃ

2- Vowels

الفتحة (َ) or short ا	a	a
Long ا	ā	ā
الكسرة (ِ)	i	i
الكسرة when preceded by ي (ِ)	ī	ī
الضمة (ُ)	u	u
الضمة when preceded by و (ُ)	ū	ū

1- Introduction

It is noticeable that the quality of some sounds changes depending on the position of the sound in the syllable/word. That is, some sounds become phonetically weaker and more susceptible to change when occurring word-finally or as part of consonant clusters than when occurring word-initially and in non-cluster positions. Stops are examples of these sounds. Donegan (2002, 57-82) states that "stops in final position are more susceptible to devoicing than stops in initial or medial position". Roach (2005, 75) notes that when a plosive precedes another plosive in a cluster as the /g/ and /k/ in the words 'rugged' and 'smoked', the release of the first plosive is achieved "without plosion and is therefore practically inaudible". Tench (2001, 257-276), in a study on the misperceptions of adult Korean learners of English, concludes that "consonants were mainly misperceived in word-final position". Among consonants, "the evidence points unmistakably to obstruents in final positions as the greatest problem for Koreans listening to English"(Ibid). In general, obstruents (plosives, fricatives and affricates) are examples of these sounds that are difficult to recognize by themselves when occurring in certain positions, i.e. prepausal- word final positions and as part of consonant clusters. Dosuna (2011, 97-106) notes that consonants in closed syllables and at the end of syllables are more prone to "weakening (lenition, backgrounding) processes".

Alshāyib (1999, 155-156) explains some positions in which Arabic stops may become incomplete. In the word /katabtu/ 'I wrote', the stops /b/ and /t/ are incomplete since the two stops follow each other without a vowel intervening. The /b/ of this word lacks the release phase and /t/ lacks the closure phase since the release phase of /b/ and the closure phase of /t/ are achieved simultaneously.

Different languages apply different techniques to guarantee the identification of these sounds in these positions. English, for example, varies the prestop- vowel length to help recognize the voicing of a final stop. This phenomenon is well documented in English. Grandgent's (1895), Lisker's (1957), Raphael's et al. (1980), Gonet's (2001), Jacewicz's et al. (2007), and Sokolović-Perović's (2009) are just a few of the numerous works done to investigate the way speakers and listeners of English distinguish, for example, between voiced and voiceless stops in prepausal final positions and in

consonant clusters. The role of factors such as voice onset time (VOT), stop closure duration, vowel duration, syllable duration, final consonant duration, and vowel plus final consonant duration in the recognition of the final (stop) consonants has been studied. The supremacy of the role of the preceding vowel duration over other factors is noted by several researchers (Lisker 1957, Ghanem 2010)¹.

Some varieties of Arabic, e.g. the Arabic of the Holy Quran (AHQ) which is the chief concern of this paper, use a different technique to recognize some stop sounds, i.e., the sounds of *qalqalah*: [b d d₃ t q]. The incomplete stops referred to above by Alshāyib (1999, 155-156) are made complete by the application of *qalqalah* in AHQ. This is achieved by inserting a short vowel after /b/ in the word /katabtu/ yielding the form [katabə tu], and this guarantees the full articulation of both stops.

2- Qalqalah in AHQ

2-1 Introduction

Since the phenomenon of *qalqalah* is mainly unique to the recitation of the Quran, it is important to give an idea about some of the major characteristics of learning and reading the Holy Quran. This seems important since it can help understand the justification for the occurrence of this phenomenon in AHQ. Reading the Holy Quran is different from reading any other Arabic text. This being the case, professional reciters of the Holy Quran, through acquiring the science of ‘Tajwīd’², are noticed to take utmost care to ensure that every sound is articulated at the right point, and that each segment takes its due time and not articulated in haste to avoid any loss of its distinctive articulatory features. Ordinary Muslims are also recommended to do this to the best of their knowledge and ability. This is taken as a religious duty since reading verses of the Holy Quran is an obligatory part of the daily prayers, and reading the Holy Quran on its own is an act of worship for Muslims. As referred to above, one of the distinguishing features of reading the Holy Quran is the application of *qalqalah*.

Another important characteristic of reading the Holy Quran which helps preserve the way it is read and prevents any changes in the pronunciation of sounds of the Holy Quran is the importance of oral transmission in reciting and memorising this book. The literal meaning of the word Quran is recitation, reading or something read. “The science of tajwīd is itself mainly transmitted orally, the student imitating and practicing the sounds produced by the teacher” (Nelson, 2002: 15). The words together with the sounds of the Holy Quran are memorized verbatim. This orality tradition in learning and teaching the

1 Research shows that vowel length in Arabic is arbitrary and is not correlated with the voicing of the consonant preceding or following the vowel. Flege and Port (1981) conclude that the duration of vowels in (Saudi) Arabic did not vary significantly depending on the voicing of the following stop.

2 “[the] art of reciting the Koran, Koran reading (in accordance with established rules of pronunciation and intonation)” (Wehr, 1974).

Holy Quran is of key importance since it prevents any changes in the features of the sounds in the Holy Quran. "Tajwīd is the system which codifies the divine language and accent of Quranic recitation in terms of rhythm, timbre, ...and phonetics" (Nelson, xvii).

2-2 Meaning of *qalqalah*

The word *qalqalah* is derived from the verb 'qalqala' which literally means '(he/it) moved it/caused to move it'. It also means '(he) sounded/voiced/ made a sound' (Ibn Manzūr, 1992). Technically speaking, it refers to the insertion of a short vowel after a number of stop sounds in the recitation of the Holy Quran. Clearly, both the general and the specific meanings apply to *qalqalah* as a sound phenomenon since, as will be discussed at length below, it is made sure that at the end of the articulation, the organs of speech of /b d ṭ d₃ q/ **move** away from each other, and this results in the sound in each case being heard clearly and not confused with any preceding or following sound. The results of moving the articulators away from each other are: ensuring the completion of the stop articulation and the production of a short vowel sound, and in some cases this vowel is followed by a consonant, that is, a glottal stop.

In addition to the term *qalqalah*, another term was used to describe these five stop sounds: 'alḥurūf almushrabah' (Sībawayh, 1991: 174, Ibn Jenni, 1993: 63). Alḥurūf is an alternative word used mainly by Arab classical linguists to refer to sounds. 'Almushrabah'³ means that they are mixed with sounds that are different from them in type/nature (Bishr, 2000: 379) since these five sounds are consonants, whereas the sounds that accompany them are vowels.

3- The phenomenon of *qalqalah*

The issues that will be investigated in this section include the reasons that call for *qalqalah*, the number of the stops eligible to take part in *qalqalah*, and the positions of the word in which the aforementioned five sounds are subject to *qalqalah*. The discussion will also consider the common characteristics among these five sounds, e.g. being stops, and why the stop sounds like the plosives /d /, /t /, /k / and /ʔ / are not subject to *qalqalah*, and how the sounds /q / and /ṭ / with their features in Modern Arabic are seen problematic members of this group.

As mentioned above, *qalqalah* is needed to ensure that the aforementioned five stops in pre-pausal word final positions and in word-medial positions before another consonant, where no vowel intervenes, are articulated fully to be recognized correctly and not confused with any other sound. This can be achieved partly by guaranteeing "full voicing of the consonant" at hand (Mitchell, 2004). The other reason that calls for the

3 One of the uses of this word is to describe colours. When one says that this colour is "بياض مشرب حمرة" [bajādun mushrabun ḥomrah], it means 'white mixed with red' (Ibn Manzūr, 1992).

existence of such phenomenon is that speakers of Arabic find it annoying to pause at a stop with no means for the air imprisoned behind the articulation points to exit. Consequently, a vowel, no matter how short it is, is the best means for exiting the captive air in this situation.⁴

In the majority of sources on *qalqalah*, it is stated that the number of sounds that contribute to this process is five: / b d ṭ d₃ q /. Nevertheless, some scholars in linguistics and in qirā'āt, i.e., the different styles of Quranic pronunciation, have suggested including some of the remaining stops in Arabic in the list. Al-mubarrid (1978: 332) adds /k/. Ibn Al-jazari (1998) says that Sībawayh mentioned /t/ as one of these sounds.⁵ Al-mar'ashi (2008) includes the glottal stop /ʔ/ in word final prepausal positions only, since, according to him, it is a voiced stop, the features that it shares with other *qalqalah* sounds. /ʔ/, in this position, must be articulated with some exaggeration lest it be weakened. 'Amāyrah (1994) suggests including the emphatic voiced alveodental plosive /d/ ⁶ and the glottal stop /ʔ/. Others go as far as considering some non-stop obstruents and even sonorants increasing the number to eleven.

The majority of authorities in qirā'āt do not consider as *qalqalah* sounds any other than the five sounds already mentioned. Ibn Al-jazari (1998), for example, offers reasons that explain his disagreement with considering /k/ and /ʔ/ as *qalqalah* sounds. In all cases, it seems logical to assume that the factor that determines whether a sound is subject to *qalqalah* or not is whether it is subject to this process in the performance of professional reciters of the Holy Quran, simply because learning reciting the Holy Quran has been done orally: a large group of people relate it to another group down a continuous chain to the Prophet Muhammad, Peace be upon him. Both past and present reciters of the Holy Quran did/do not insert a vowel or a glottal stop after prepausal or preconsonantal /t/, /k/, /d/, /ʔ/, /f/, /ð/, /z/, or /l/. As the analysis below will show, the five sounds / b d ṭ d₃ q / share certain characteristics that qualify them to form a natural class, and that other sounds particularly the remaining stops of Arabic lack certain features or have extra ones that divest them membership in this class of sounds.

The sounds / b d ṭ d₃ q / are subject to *qalqalah* when they occur word-finally before a pause, e.g., لهب /lahab/ → ['lahab^ʔ] 'flame', and the bilabial stop here is said to

4 This is not to claim that speakers of Arabic in every day speech use *qalqalah* but we can notice a similar strategy that they use in breaking consonant clusters in words like بطن /baṭn/ in which a vowel is inserted giving [baṭin]. However, the vowel inserted in this form of Spoken Arabic is a full vowel and not like the very short and incomplete vowel sounds that accompany *qalqalah* stops in AHQ.

5 I could not find /t/ among the *mushrabah* sounds in Sībawayh's *Alkitab*.

6 Sībawayh (1991, vol. 4, p. 574) and following classical linguists classified /d/ as a voiced fricative not a plosive.

be subject to major *qalqalah*.⁷ The other position is word-medial before another consonant when the stop and the following consonant are not separated by a vowel, e.g. قبل /qabl/ → [qab^ol] ‘before’, and this type is called minor *qalqalah*.⁸ Because the sound /b/ is liable to lose some of its distinguishing characteristics in these positions, AHQ has developed this technique to ensure that this sound and the other four are articulated fully. To achieve this, vowel insertion word medially or vowel insertion word finally takes place. This inserted vowel is sometimes followed by a glottal stop insertion.

As for the common characteristics among these five sounds, classical linguists and Quranic orthoepists state that these sounds are voiced stops. Sībawayh (1991), who does not use the term *qalqalah* sounds and uses the term “mushrabah sounds” instead, classify /b d ṭ d₃ q/ among the stops (p. 174); he then mentions these five among the voiced sounds (p. 434). Ibn Jenni (1993, 60) does the same. Ibn Aljazari (1998) and Almar‘ashi (2008) also specify them as voiced stops. There is an agreement among classical and modern scholars on the voicing of /b d d₃/, i.e. that they are voiced. /ṭ/ and /q/ are problematic with regard to this feature since they are considered voiced by classical scholars while they are classified voiceless based on the way they are pronounced in modern time. I think a digression is needed to shed more light on this issue.

This disagreement on the voicing of the two *qalqalah* sounds /ṭ/ and /q/ has received the attention of several researchers: Alḥamad (2004), Bishr (2000), ‘Abduttawwāb (1997), and ‘Amāyrah (1996) to name just some. In order to explain the dilemma of /q/ and /ṭ/ which are voiceless in Modern Arabic but described as voiced in the classical literature on Arabic sounds, writers attempt to explain this state of affairs in different ways. Here are some of them:

- 1- Some writers (Bishr, 2000: 251, Alshāyib, 1999: 164, 169, Alḥamad, 2004: 281) think that classical linguists were wrong in describing the voicing of /q/ and /ṭ/. This can be due to not having enough means and facilities to distinguish between voiced and voiceless sounds, or that the voicing criterion in their time was different from that in modern time since, according to Bishr (p. 251), classical linguists did not refer to the role that vocal cords play in producing voicing. A related possibility which is suggested by Alḥamad (2004, 281) is that Sībawayh’s description is correct and it describes our modern (voiceless) /q/, but the conclusion he arrived at, i.e. that /q/ is voiced, was wrong.
- 2- These sounds were subject to development through which their voicing status changed from voiced to voiceless (Bishr, p.251, Alḥamad, 2004: 279, Shāhīn, 1991: 222, 225).

7 It may be called major *qalqalah* because it involves the insertion of both a short vowel and a glottal stop.

8 It may be called minor *qalqalah* because it involves the insertion of a short vowel alone.

3- Classical linguists might describe different /q/ and /t/ from those that exist nowadays in Arabic (Bishr, 2000:252- 278, Alshāyib, 1999: 164-169).

Again it is hard to prove beyond reasonable doubt any of these points of view. But in my opinion, the voicing feature on its own is unimportant in the first place to decide whether a stop is subject to *qalqalah* or not. Bishr (2000, 387), on the other hand, agrees /q/ was a voiced sound, but adds that regardless of whether it was voiced or voiceless, it is subject to *qalqalah*.

Another piece of evidence which points to the fact that voicing is not a prerequisite of *qalqalah* can be taken from the /d/ sound. If we agree with the description of the classical linguists that this sound is a voiced fricative, what has prevented it from becoming a *qalqalah* sound when it became a stop as it is pronounced in Modern Arabic?

In this paper, a different explanation is presented to deal with the problems regarding the role of voicing in *qalqalah*, i.e., the exclusion of the voiced plosive /d/ and the inclusion of the voiceless /q/ and /t/ in the sounds that undergo *qalqalah*.

The second part of the description of *qalqalah* sounds, i.e. being stops, is on the whole not subject to contention since the sounds /b d t q/ are undoubtedly plosives/stops, and the first and major part of the affricate /d₃/ is indisputably composed of a stop sound, i.e., /d/. As is well-known, the stops / b d t q/ are articulated in two major phases: stopping the air stream completely somewhere in the oral cavity and releasing it suddenly. The affricate /d₃/ lacks the latter stage, i.e. the burst of air release. In more details, these two phases of the articulation of the first four sounds can be extended to four: closure, compression, release and post release. If the four phases are achieved, the phonetic identity of the sound cannot be confused with other sounds. But, since sounds are not normally made in isolation and that they are naturally part of larger units, the speaker does not have time to go through all four phases. In other words, during speaking at normal speed, one may find time to make a stop sound by going through two or sometimes one phase only. And for this reason, it is sometimes hard to distinguish /t/ from /d/ in pre-pausal word-final positions or in consonant clusters because of not achieving, for example, the release and post release phases. This state of affairs may have led Arabic to develop the phenomenon of *qalqalah* to ensure that the sounds / b d t d₃ q/ are clearly recognized in certain positions.

Since the *qalqalah* sounds comprise voiced as well as voiceless stop sounds, one may legitimately ask about the reasons that explain the absence of the voiceless plosives /t k/, the voiced plosive /d/, and the glottal stop /ʔ/ from the list. Several proposals have been put forward to explain the absence of the voiceless stops /t/ and /k/ from the list. One of them is the degree of aspiration and friction these sounds are said to end with in word-final positions. Almar'ashi (2008, 149) describes the sound that accompanies the

release of [k] and [t] in a way, which among other things, reveals an awareness of the phenomenon of aspiration. He refers to a weak whispering sound that accompanies a continuous rush of air which is typical of voiceless stops, but the weakness of this accompanying extra/released sound disqualifies /t/ and /k/ from being subject to *qalqalah*. The possible affricated pronunciation of /t/ and /k/ also bar them from undergoing *qalqalah*. 'Amāyrah (1996, 210) considers allophonic varieties of /t/ like the one that ends with a hissing sound similar to /s/, hence an affricate, or the possibility of the tongue slipping away from the alveolar ridge towards the palate. The affrication process is even clearer in the case of /k/ through which some speakers of Arabic, both in the past and now, change it to [tʃ] or [ts]. When /t/ and /k/ are aspirated or changed to affricates, this grants that they are released because of ending with a continuant sound, i.e. [^h ʃ s], and this is, in the viewpoint of some ('Amāyrah, 1996, 210-212), sufficient to make these two sounds easily distinguishable in word-final position and pre-consonantal positions and consequently not subject to *qalqalah*.

In my opinion, *qalqalah* is not determined solely by voicing. In the case of these plosives, voicing interacts with emphasis. To the best to my knowledge, Alḥamad (2004) may be the only writer who refers to this point. Discussing the participation of /t/ and /q/ in *qalqalah* and considering their description as voiced by classical linguists and their status as voiceless in Modern Arabic, Alḥamad (p.119) briefly comments on this situation saying that “the reciters of the Holy Quran in our time and the speakers of Arabic are keen to ensure that these two sounds are subject to *qalqalah* as if the emphasis [being emphatic] they have strengthens the sound that follows them [the inserted vowel] and makes them similar to the voiced plosives which are subject to *qalqalah*” (ibid.). The writer does not explain the relationship between emphasis and voicing in enhancing or hindering the possibility for the stop to take part in this process. The role of emphasis and voicing will be commented on below.

In my opinion, the sounds /t k/ are not part of this phenomenon not because of their voicelessness alone but because they are [-emphatic]⁹. Therefore, these two sounds are

not subject to *qalqalah* since they are

$$\left[\begin{array}{l} - \text{sonorant} \\ - \text{continuant} \\ - \text{emphatic} \\ - \text{voiced} \end{array} \right].$$

Put another way, voiceless plosives are subject to *qalqalah* when they are [+emphatic]. As for modern /d/, it is a voiced plosive like /b d/, a fact that makes it

9 The feature [±emphatic] is used here instead of the features [±flat], [±RTR] (Retracted Root Tongue), [±pharyngeal] and [±back] which have been used in the literature. This is in agreement with several writers who have worked on the phenomenon of emphasis in Arabic and other languages, e.g. Laufert & Baer (1988) and Jongman et al (2011). This is done to avoid some of the contextually emphatic sound in Arabic e.g. vowels.

theoretically eligible to undergo *qalqalah*, but it does not. The difference between /d/, on the one hand, and /b d/ on the other is that the former is [+emphatic] while the latter are

not. Put differently, for $\left[\begin{array}{l} - \text{sonorant} \\ - \text{continuant} \\ + \text{voice} \end{array} \right]$ sounds to undergo *qalqalah*, it is stipulated that they

be [-emphatic]. For this reason, /d/ is excluded from the five-sound list since it is [+emphatic].

The relationship between emphasis and voicing can be explained in another way. If two sounds are theoretically subject to *qalqalah*, e.g. the homorganic /d/ and /d/, because they are plosives and voiced, Arabic chooses the non-emphatic one to take part in this process, i.e. /d/. When two homorganic voiceless stops are present, e.g. /t/ and /t/, it is the voiceless emphatic sound that undergoes *qalqalah*, i.e. /t/ at the expense of the non-emphatic voiceless stop. In other words, if both exist in Arabic, it is not possible for the emphatic and non-emphatic stop sounds to be among *qalqalah* sounds. As for /q/ and since there is no voiced counterpart of this sound in Arabic and because of being [+emphatic], it undergoes this process.

The exclusion of the glottal stop from the sounds subject to *qalqalah* can be explained in two ways. The first concerns the tendency among the speakers of some classical prestigious dialects of Arabic, the Arabic of Quraysh for example, to avoid /ʔ/ in one of the following ways: replacing the glottal stop by means of lengthening the following vowel¹⁰, transferring it to another position or by means of deletion. Second, if *qalqalah* is viewed partially as the insertion of a glottal stop, it will be inconceivable to insert a glottal stop after another glottal stop.

As for the quality of the vowel inserted after the five stops, it is often described as a 'ṣuwayt', i.e. the diminutive form of 'ṣawt': a sound (Sibawayh, 1991: 174; Alṣāmirrā'i in Mar'i, 1993: 122; Ibn Manzūr, 1992). This sound is more specifically described as a very short vowel, an incomplete vowel, a sound similar to a vowel, or a snapped vowel, as it were, (Alḥamad, 2004: 120, Alsa'rān, 1961: 161-162). This vowel sound is so short that it cannot be assigned to any of the vowel phonemes known in Arabic ('Amāyrah, 1996, 198, Bishr, 2000: 380). Reciters of the Holy Quran are warned against exaggerating this sound so as not to reach the status of a full vowel (Ibn Aljazari, vol. 1, 162). It must be remembered that this vowel sound is complementary to the stop and results from the articulators moving away from each other ('Amāyrah, 1996: 198). Based on this, I disagree with the scholars who describe the vowel materialised in *qalqalah* as an open front vowel 'fathāh'. It is also difficult to agree with the scholars who describe it as either

¹⁰ This phenomenon is called 'Tashīl' and it is perfectly acceptable in the speech of some classical tribal dialects of Arabic and the recitation of Quran according to the science of Qirā'at.

a short close front vowel ‘kasrah’, a short open front vowel ‘fathah’ or a short close back vowel ‘dhammah’ depending on the preceding vowel (Ibid.). If it is possible to perceive the resultant sound as one of the preceding possibilities, we are faced with a situation in which there is a full identifiable vowel phoneme not with one whose quality is indeterminate. I agree with Alsa‘rān (1961, 162) who describes the vowel that accompanies *qalqalah* sounds as a weak central vowel. Gadoua (2000) suggests using the symbol for the schwa [ə] to represent the post-*qalqalah* sounds since schwa is not vowel phoneme in Arabic. Mitchell (2004) also refers to the articulation of *qalqalah* sounds in Quranic recitation “with a central vocalic-off glide”. To support this point of view, let’s compare two words: a word with a complete identifiable vowel and another word with a vowel which results from *qalqalah*. These words are خَلَقْنَا [χalaqana] ‘He (has) created us’ and خَلَقْنَا [χalaqəna] ‘We (have) created’. It seems clear that whereas it is easy to assign the third vowel in the first word to the open front unrounded category of vowels in Arabic, the decision is difficult, if at all possible, with regard to the third vowel in the second word. Consequently, the post /q/ vowel in the second word is best viewed as a phonetic vowel that completes the articulation of the preceded *qalqalah* sound, i.e. /q/ as a result of a full release of this stop sound.

4- Are / b d t ḍ q / subject to the same degree of *qalqalah*?

Among the five sounds, /q/ is said to experience a more complete or a clearer degree of *qalqalah* than the remaining four (Almar‘ashi, 2008: 149; Makki, 1996: 125). In other words, it is the sound the articulators of which experience the strongest degree of *qalqalah* ‘unrest’ and may be followed by the ‘strongest’ possible short vowel. The word final /q/ in فوق [fawq^{oʔ}] ‘above’ has more *qalqalah* than any of remaining *qalqalah* sounds in the same position. /q/ is even subject to a stronger degree of *qalqalah* when it occurs word finally and simultaneously as part of a geminate as in حقّ [haqq^{oʔ}] ‘truth/ correctness’. /b/, on the other hand, as in the word سبب [sabab^{oʔ}] ‘reason’ is said to be subject to the weakest degree of *qalqalah*. It seems that the [+back] *qalqalah* sound, i.e. /q/, is subject to more *qalqalah* than [-back] sounds like the stop /b/. Theoretically, this may mean that the degree of *qalqalah* decreases gradually when we move from [+back] *qalqalah* sounds to [-back] ones. This may be due to stops experiencing a “...decrease in duration of the closure interval as place of articulation moved further back in the mouth” (Flege and Port, 1981). It seems that the shorter the time of closure, the more difficult it is to recognize the stop, and, consequently, Arabic utilizes *qalqalah* to enable listeners to identify the stop at hand.

5- Qalqalah stops as a natural class

The five sounds seem to represent a natural class since they can be characterised by a number of distinctive features. First, the group represents stop sounds which can be specified as [-continuant] (Chomsky and Halle (1986, 317); Sommerstein (1977, 103); Katamba (1989, 50)). There is no need to further distinguish between the plosive members of this group, i.e. /b d t q/ and the affricate /dʒ/ since the five sounds behave the same in this phenomenon.

The feature [±voice] is problematic since *qalqalah* sounds include both voiced and voiceless stops (cf. Section 3). The discussion in that section leads to the conclusion that voicing is not a requirement for a stop to take part in *qalqalah*. And even when it is relevant, it is discussed together with the feature [±emphatic]. In other words, it is possible to accept the fact that *qalqalah* stops can be voiced and voiceless, and yet they form a natural class without resorting to the feature [±voice]. To put differently, the two features [±voice] and [±emphatic] can be taken together to qualify or disqualify a stop to the class of sounds that can undergo *qalqalah*.

Another feature has been proposed to distinguish *qalqalah* stops not only from other sounds in Arabic but from other Arabic stops as well. The feature [±*qalqalah*] has indeed been introduced by some researchers, e.g. Alfozan (1989: 41), Mitchell (2004), and Laufert and Baer (1988). Second, the idea of the interaction between voicing and emphasis which is already introduced in this paper (cf. Section 3) is another alternative in which two existing features, i.e. voicing and emphasis, are used to give explanation to the membership of some (voiceless) stops, i.e. /q/ and /t/, and the absence of some voiceless stops from the list, i.e. /k/ and /l/. The same notion can be used to explain the exclusion of /d/ which is similar to the *qalqalah* sounds /b/, /d/, and /dʒ/ in being stop and in voicing. In wait of further research in this area, the second alternative may present a new feasible approach to deal with the *qalqalah* sounds in AHQ.

6- Is qalqalah used in varieties other than AHQ?

It is not difficult to notice that *qalqalah* nowadays is used mainly in the recitation of the Holy Quran. However, it is not hard either to find some examples of the application of *qalqalah* by some speakers of Arabic particularly preachers and scholars of Sahri'ah¹¹ even when they do not recite from the Holy Quran. And even speakers of Arabic who are knowledgeable in the language and those who intend to sound formal may use *qalqalah* in their speech.

As for Classical Arabic, it can be inferred from the way classical linguists of Arabic such as Sibawayh (1991, 174) and Ibn Jenni (1993, 63) discuss the phenomenon of

¹¹ "the revealed, or canonical, law of Islam" (Wehr, 1974).

qalqalah as any other aspect of Arabic, that is, without treating it as characteristic of the pronunciation of the Holy Quran only. Based on this, it can be said that before and during the time of these scholars, *qalqalah* was an ordinary aspect of the Arabic spoken then.

7- Does *qalqalah* occur in other languages?

Phenomena similar in varying degrees to *qalqalah* occur in other languages. Campbell (2004, 37) cites two languages in which vowels are inserted after certain sounds. In Spanish, a vowel is 'sporadically' inserted before word-final [d] as in *huespede* from *huespede* 'guest'. Interestingly, the oral stop /d/ is one of the stops subject to *qalqalah* and consequently to vowel insertion in Arabic. In Arandic languages (spoken in Australia), /ə/ is inserted finally in words that end in consonants. The insertion of vowels in post word final consonant positions also takes place in some dialects of Italian and Hebrew, bearing in mind that the latter belongs to the same language family of Arabic. Vowel insertion after word final stops is also attested in loanword adaptation as witnessed in the performance of Koreans adapting English words by adding the vowel [ɪ] (Kang, 2003). A similar tendency is attested in the performance of speakers of Brazilian Portuguese when adapting English words (Baptista and Watkins, 2006, 7).

Glottalisation in English appears to be a related phenomenon in which a glottal stop is inserted before the voiceless stops [p t k tʃ] when they occur syllable- medially or finally. Sometimes the glottal closure – which yields a glottal stop – occurs after the stop, and this form of glottalisation (Wardhaugh, 1977: 39) is similar to what happens to the Arabic stops subject to *qalqalah*, particularly in prepausal word final positions. The difference between glottalisation in English and *qalqalah* in Arabic is that the former applies to voiceless stops only, whereas the latter applies to a certain group of both voiced as well as voiceless stops.

8- Conclusion

As has already been stated, the aim of this paper is to investigate the recognition of *qalqalah* stops in the Arabic used in the recitation of the Holy Quran. /b d t dʒ q/ are the five sounds subject to *qalqalah* in the opinion of the majority of classical and modern linguists and specialists in Quranic recitation. The pronunciation of these sounds, when occurring finally before a pause or as part of a consonant cluster, is accompanied by a short and an incomplete vowel to ensure their full articulation so that their identity is not confused with any other sounds. The five sounds that undergo this phenomenon are all stops which can be voiced (/b d dʒ/) or voiceless (/q t). Voicing on its own is not found to play a decisive role in whether a stop is a *qalqalah* sound or not. In the case of the stops /t k ʔ/, Arabic has developed ways to ensure their full articulation in the positions referred to like aspiration and affrication in the case of /t k/, and deletion or changing into

vowel in the case of /ʔ/, and this leads to excluding them from being subject to *qalqalah*. Despite the fact that /d/ is a voiced stop like /b d dʒ/, it does not take part in this process because of being [+emphatic]. It seems that if a stop is both voiced and emphatic, it does not take part in *qalqalah*. To put it differently, a voiced stop is subject to *qalqalah* if it is [-emphatic], e.g. /b d dʒ/. Voiceless stops, i.e. /t q/, on the other hand, undergo *qalqalah* since they are specified [+emphatic].

It is worthy of noticing that *qalqalah* is mainly characteristic of the recitation of the Holy Quran, though it seems from the literature on the sounds of Arabic that it was a feature of Arabic in general at one stage.

مقاربة مختلفة للتعرف على أصوات القلقة في اللغة العربية

الدكتور عبدالله حامد الحجوج

ملخص

يهدف هذا البحث إلى دراسة الطريقة التي يمكن التعرف من خلالها على مجموعة من الأصوات الوقفية في اللغة العربية المستخدمة في تجويد القرآن الكريم. هذه الأصوات الوقفية هي / ب د ط ج ق/ تشترك في ظاهرة تسمى القلقة والتي تعني إقحام شبه حركة (مع إقحام الصوت الوقفي الحنجري /الهمزة أحياناً) لتحديد هوية هذه الأصوات عندما تكون في نهاية الكلمة قبل الوقف أو في وسط الكلمة كجزء من التتابعات الساكنة. إن من المسائل الشائكة التي تتعلق بظاهرة القلقة هي أن مجموعة الأصوات التي تتأثر بهذه الظاهرة تشمل أصواتاً وقفيةً مهموسةً وأخرى مجهورة. لقد تمّ تقديم بعض المقترحات لتفسير ذلك ومن بينها أن هناك تفاعلاً بين صفتي التفخيم و الجهر/الهمس يفسر وجود صوتي /ط ق/ المهموسين إلى جانب أصوات /ب د ج/ المجهورة. وتمّ استخدام نفس المقترح لتعليل غياب الوقفيتين المهموستين /ت ك/ وصوت الوقفة المجهور /ض/ من الأصوات المقلقة. كما و يشمل النقاش بحث أسباب أخرى لعدم وجود الوقفيات /ت ك ء/ ضمن قائمة أصوات القلقة.

كلمات مفتاحية: اللغة العربية، القرآن الكريم، إقحام الحركة، الجهر/الهمس، القلقة، التفخيم

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