

## Problems of Romanizing Word-Initial Glottal Stops in Modern Standard Arabic

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### **Abstract**

*The present study addresses issues related to the romanization of Modern Standard Arabic (MSA) words pronounced with an initial glottal stop, both through transliteration and phonemic or phonetic transcription. The study argues that, in MSA, an utterance-initial glottal stop which is an integral part of a word or a prefix is phonemic, while an epenthetic glottal stop is non-phonemic, and that each type should be represented differently in romanization. This argument is supported by evidence from near-minimal pair tests and comparisons between MSA words with epenthetic glottal stop and English vowel-commencing words, as well as insights from cognitive phonology. In this context, a number of authentic transliterations and transcriptions, drawn from widely used romanization systems as well as essential works in phonetics and Arabic language teaching, are examined to see how word-initial glottal stops are romanized in different utterance positions. This has revealed a number of recurrent problems in representing word-initial glottal stops as well as the words immediately preceding them when they occur in utterance-medial position. It is suggested that most of these problems could be avoided by observing the distinction between phonemic and epenthetic glottal stops.*

**Keywords:** *Modern Standard Arabic, epenthetic and phonemic glottal stops, transliteration, transcription*

## الهزمة في بداية الكلمات في الفصحى المعاصرة ومشكلات تمثيلها بالأحرف الرومانية ملخص

تتناول هذه الدراسة بعض القضايا المتعلقة برسم الكلمات العربية البادئة بالهزمة بالأحرف الرومانية، سواء عن طريق النقل الحرفي أو عن طريق الرموز الصوتية، إما بطريقة الرسم الصوتي العام (الفونيمي) أو بطريقة الرسم الصوتي الضيق (الفونيطيقي). وتجادل الدراسة بأن صوت الهزمة الذي يظهر في بداية المنطوق في الفصحى المعاصرة يمكن أن يكون صوتاً أصيلاً في الكلمة أو في سابقة ألحقت بها، وفي هذه الحالة يعد وحدة صوتية (فونيم)، ويمكن أن يكون صوتاً زائداً جلب لتيسير النطق عند ورود ساكن في بداية المنطوق، وفي هذه الحالة لا يعد وحدة صوتية، وأن لكل نوع أسلوباً مختلفاً عند النقل للأحرف الرومانية. ويدعم هذا الطرح اختبار الثنائيات المتقابلة التي تختلف في صوت واحد، ومقارنة الكلمات العربية البادئة بهزمة بالكلمات الإنجليزية البادئة بصائت عند ورود الكلمات في اللغتين في بداية المنطوق، إضافة إلى بعض الآراء من علم وظائف الأصوات الإدراكي. وفي هذا السياق تحلل الدراسة عدداً من النصوص العربية المكتوبة بالأحرف الرومانية بطريقة النقل الحرفي أو الرسم الصوتي العام أو الضيق، وذلك في بعض المراجع الأساسية في الصوتيات وكتب تدريس اللغة العربية للناطقين بالإنجليزية، وكذا في أنظمة النقل الحرفي الشائعة، للوقوف على طريقة تمثيل الهزمة في تلك الأعمال، حيث كشفت الدراسة عن عدد من المشكلات المتكررة في تمثيل الكلمات البادئة بهزمة والكلمات السابقة عليها عند ورودها في بداية المنطوق. وتشير الدراسة إلى أن أكثر هذه المشكلات يمكن حلها عن طريقة التفرقة بين الهزمة الأصلية والهزمة الزائدة.

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### 1. Introduction

With the growing body of research about Arabic in publications that use Roman script and the increasing number of learners of Arabic worldwide, accurate representation of Arabic, through transliteration or transcription, is becoming more and more important. Romanization of Arabic is required not only for language learning and linguistic research, but also in other fields, such as translation studies, natural language processing, Arab culture, and Islamic studies. However, researchers and scholars realize that there are many issues related to the transliteration and transcription of Arabic words. As Eid et al. (2006, p. viii) note, the transcription of Arabic “is always a problem”, especially when the aim is to represent different varieties of Arabic. However hard researchers and editors may try to produce error-free transcriptions or transliterations, some inaccuracies often find their way to final works. As Ryding (2014, p. 145) observes, “transliteration errors and inconsistencies tend to creep into even the best-edited publications.” Another source of difficulty is that it is not always clear whether the romanization in question is intended to be a transliteration, a phonemic transcription, or a phonetic transcription.

One area of difficulty relates to words pronounced with an initial glottal stop and the way they are represented in utterance-initial position (i.e., when the word occurs at the beginning of speech, in isolation, or after a pause) and in utterance-medial position, in which case the pronunciation of the immediately preceding word may undergo some changes. There seem to be some inconsistencies and unjustified practices in this respect, which can be confusing to researchers and learners of Arabic. The main aim of the present study is to show the inadequacy of some current romanization methods in representing word-initial glottal stops in Modern Standard Arabic (MSA) and to provide some general principles that can help researchers and scholars represent them in a more satisfactory manner. With this practical aim in mind, the study addresses the following questions: (1) What are the common problems of MSA glottal stop romanization encountered in published works?, (2) What are possible reasons for the recurrence of such problems?, and (3) How should word-

initial glottal stops in MSA be represented in transliteration, phonemic transcription, and phonetic transcription, both in utterance-initial and utterance-medial position? MSA refers to the written or spoken variety of Arabic that generally follows the rules of pronunciation, syntactic structure, and word endings set by Classical Arabic grammarians. The suggestions made here do not apply to colloquial varieties of Arabic, which have their own rules regarding word-initial vowels and glottal stops (see, e.g., Broselow, 2018 and Hassan & Heselwood, 2011, for a variety of Arabic dialects; Watson, 2002, for Cairene & San‘ani Arabic).

The present paper adopts a qualitative approach and follows a deductive line of argument. After providing the general principles according to which transliteration and transcription are normally conducted, the study shows that the glottal stop that occurs in utterance-initial position in MSA can be epenthetic or non-epenthetic, arguing that each type should be represented differently in transliteration, phonemic transcription, and phonetic transcription. The paper then investigates how Arabic word-initial glottal stops are actually transcribed and transliterated in authentic texts, highlighting any discrepancies between their actual romanization and the romanization proposed in the light of the principles already provided. The views presented in the study are further supported by minimal pair evidence as well as insights from cognitive phonology. Finally an attempt is made to explain the different, and sometimes opposing, practices encountered, linking some of them to Arabic orthography and others to phonotactic rules of Arabic syllable structure. This argument-centred approach is appropriate for the purposes of the study, which seeks to provide accurate criteria for romanizing MSA word-initial glottal stops, both in utterance-initial and utterance-medial positions.

In selecting the texts and romanization systems to be investigated, an essential requirement was that they should be academically recognized and commonly used in scholarly works. Accordingly, the texts examined were drawn from main references in phonetics, such as the *IPA Handbook* (IPA, 1999), and from widely used textbooks intended for teaching Arabic to speakers of English (e.g., Bateson, 2003; Haywood & Nahmad, 1965; Holes, 2004; Ryding, 2014), in addition to the *International Journal of Middle East Studies* (IJMES)<sup>1</sup> and the Library of Congress (LOC)<sup>2</sup> romanization systems, which are adopted in many academic publications.

<sup>1</sup> See: [https://ijmes.chass.ncsu.edu/IJMES\\_Translation\\_and\\_Transliteration\\_Guide.htm](https://ijmes.chass.ncsu.edu/IJMES_Translation_and_Transliteration_Guide.htm).

<sup>2</sup> See: <https://www.loc.gov/catdir/cpso/romanization/Arabic.pdf>.

Transliteration systems that are not expected to abide by academic standards, such as those used for social media chatting or those that serve purely commercial purposes, fall outside the scope of this paper.

The differences among transliteration, phonemic transcription, and phonetic transcription as methods of romanization need to be pointed out before proceeding further with the discussion. Transliteration is a type of respelling that represents the words of a given language using the orthography of another. A strict transliteration, usually used in computational representation of a foreign language script (e.g., Habash, Souidi, & Buckwalter, 2007), is fully reversible, in the sense that a back transliteration of the respelling should yield the original language script. While it is not the aim of transliteration to represent pronunciation, due to the nature of Arabic orthography, transliteration can relatively indicate pronunciation at the word level, and some systems, including those of IJMES and LOC, introduce rules to remove some spelling-pronunciation inconsistencies. Transliteration can be a convenient way of representing Arabic in areas of linguistic research where reproducing exact Arabic pronunciation is not crucial. One advantage of transliteration is that it permits the use of capitalization and punctuation marks to distinguish proper nouns and adjectives and facilitate comprehensibility. This is not possible with phonemic or phonetic transcription, where changing a character case, for instance, can change the sound it indicates (e.g., /g/ and /G/). Transliteration also allows the use of italicization to distinguish items that are ordinarily written in italics, such as book and newspaper titles.

Transcription, on the other hand, can be phonemic or phonetic. Phonemic (or broad) transcription shows the phonemes of which a word is composed rather than the realizations of these phonemes. Like transliteration, it is not intended to represent the exact pronunciation of words in actual utterances, but only the contrastive sounds that can make a difference in meaning. Allophones are represented in phonetic (or allophonic, or narrow) transcription, which seeks to represent the sounds as they are pronounced in actual usage rather than the phonemes to which such sounds belong. Ideally, phonetic transcription should indicate all non-contrastive sound variations, such as velarization, aspiration, nasalization. However, since it is hard to represent all the details of actual pronunciation, which naturally change from one speaker to another and from one context to another, normally only those allophonic features which are relevant to the purposes of specific studies are shown in the transcription. The above distinctions are generally accepted and well-established in the literature

(see, e.g., Cruttenden, 2014; Hassan & Heselwood, 2011; Heselwood, 2013; Ryding, 2014), though, as is shown below, they are not always observed in actual practice.

While the common practice in transcription is to separate words by spaces, this is not always possible in representing MSA, where a word ending often interacts with the beginning of the following word, leading to different types of elision and assimilation. To facilitate readability, I follow the practice of separating orthographic words in transcription unless there is interaction between final and initial sounds in connected speech, in which case the undertie symbol (⏟) is used to show linking (e.g., *fī al-kitāb* ‘in the-book’ is transcribed as /fi⏟lkita:b/). Hyphens are used to show the internal morphological structure of words in interlinear examples or if morphological analysis is relevant to the point being discussed (e.g., /bi-l-maktab/ ‘in-the-office’).

## 2. The Glottal Stop in MSA

In MSA, the glottal stop (represented in transcription by the symbol /ʔ/) is a contrastive phoneme that has the power of changing the meaning of words, and as such it can occur in different positions of the word. This is indicated by minimal sets contrasting /ʔ/ with other sounds in word-initial position (e.g., /ʔamal/ ‘hope’, /dʒamal/ ‘camel’, and /ʕamal/ ‘work’), in middle position (e.g., /saʔala/ ‘to ask’, /saħala/ ‘to drag on the ground’, and /saʕala/ ‘to cough’), and in final position (e.g., /ma:ʔ/ ‘water’, /ma:l/ ‘money’, and /ma:s/ ‘diamond’). This phonemic glottal stop is an integral part of the root of the word (e.g., /ʔakala/ ‘to eat’) or of an affix attached to it (e.g., /ʔa-ktubu/ ‘I-write’, derived from the verb /kataba/ ‘to write’ by adding an inflectional prefix /ʔa/, or /ʔantadʒa/ ‘to produce’, derived from the verb /natadʒa/ ‘to result’ by adding the causative prefix /ʔa/). On the other hand, there are cases in which the glottal stop is neither part of the root of a word nor of a prefix attached to it, but is rather an “epenthetic” sound (e.g., Lombardi, 2002; Prince & Smolensky, 2004; Ryding, 2014) which is inserted to permit the pronunciation of an initial vowel. It is argued here that this epenthetic glottal stop, which is not used in utterance-medial position, is not contrastive, unlike the glottal stop that is part of a word’s morphological elements. This means that, in utterance-initial position, a glottal stop in MSA can be phonemic or non-phonemic (epenthetic).

### 2.1 The Epenthetic Glottal Stop

The phonotactic rules of MSA do not permit starting speech with a consonant cluster, and if one occurs in utterance-initial position, a vowel

must be added to allow for its pronunciation. Again, since a vowel is not pronounceable by itself in utterance-initial position, a glottal stop is inserted to make it pronounceable. This epenthetic glottal stop does not appear in the middle of the utterance, where the formation of the syllable is determined by the final segments of the preceding word or morpheme.

One of the examples discussed within the framework of Optimality Theory (Prince and Smolensky, 2004) to elaborate on epenthetic structure is the glottal stop that appears at the beginning of the Arabic definite article, *al-*, pronounced [ʔal] in utterance-initial position. In Optimality Theory, syllabification is subject to “the ONS constraint”, according to which “every syllable has an onset”, which, if lacking, must be filled with segmental material “the FILL constraint” (Prince & Smolensky, 2004, p. 30). Prince and Smolensky note that “Arabic unmistakably exhibits the ONS constraint” (2004, p. 30), which it does by providing vowel-initial syllables with a glottal stop as an onset. Thus, “from an input /al-qalam+u/ ‘the-pen (+nom.)’, we get an output ʔalqalamu” (Prince and Smolensky, 2004, p. 28). Nathan, who also believes that “Arabic requires that every syllable begin with a consonant”, refers to the view that “syllable initial glottal stop is simply an empty consonant” (2008, p. 47) that fulfils the onset function (though this does not apply to phonemic glottal stops, as shown above).

Similar treatments assume that glottal stop epenthesis involves three stages: the occurrence of a word with an initial consonant cluster, the insertion of a vowel to prevent such cluster, and the insertion of a glottal stop to fill in the onset position. Bateson (2003, p. 7) uses the term “anaptyctic vowel” to refer to the vowel that is inserted before a word-initial consonant cluster at the beginning of an utterance, while Ryding (2014, e.g., p. 27) uses the more common term “epenthetic” to refer to the same phenomenon. Again, one of the examples given by Bateson (2003) and by Ryding (2014) is that of the Arabic definite article, which they conceive of as consisting only of *l-*, without a preceding vowel—a view that has its origin in traditional Arabic grammar. When *l-* is added to a consonant-commencing word (e.g., /qalam/ ‘pen’), this results in an initial consonant cluster, /lqalam/, which is not permitted in Arabic. To overcome this problem, /a/ is added as an anaptyctic vowel, resulting in /alqalam/, which is not possible in initial position since it starts with an onsetless syllable. Accordingly, an epenthetic glottal stop is added (i.e., [ʔalqalam]). The rule formulated by Bateson (2003, p. 7) is: \*CCv → \*vCCv → ʔvCCv.

The above analysis works well when the definite *al-* is attached to a word starting with a consonant, but does not explain why the same thing happens when it is attached to a word which itself starts with an epenthetic vowel. An example is the word *al-istiqlāl* ‘independence’, which, in utterance-initial position, is pronounced [ʔalistiqla:l], even though the attachment of *l-* does not result in an initial consonant cluster, but in a CVC sequence, which is permissible in Arabic. The word could well be pronounced [listiqla:l] in initial position, without breaking the phonotactic rules of MSA syllable structure. However, in actual usage, the pronunciation [listiqla:l] occurs only in utterance-medial position. Examples (1a) and (1b) show the pronunciation of the word in initial and middle position after a consonant-ending word. Examples (1c) and (1d) show its pronunciation after words ending in a short vowel and a long vowel, respectively. (It is noted that abstract nouns in MSA are normally used with the definite article; thus, the noun *independence* is in most contexts equivalent to *al-istiqlāl*, literally, ‘the-independence’.)

- (1)
- a. [ʔali-stiqla:l-u                      t-ta:mm]
 

ART-independence-NOM    ART-complete  
‘complete independence’
  - b. [difa:ʕ-an                              ʕan    li-stiqla:l]
 

defence-ACC.INDF.PURP    of    ART-independence  
‘in defence of independence’
  - c. [min ʔadʒl-i                      li-stiqla:l]
 

for    reason-GEN    ART-independence  
‘for the sake of independence’
  - d. [ʔat<sup>ʕ</sup>-t<sup>ʕ</sup>ari:q-u                      ʔila:    li-stiqla:l]
 

ART-road-NOM            to    ART-independence  
‘the road to independence’

As (1b) shows, after a consonant-ending word, no epenthetic [i] is added before a definite article that is attached to the word *istiqlāl*. This is contrary to what happens when the definite *al-* is attached to a consonant-commencing word (cf., [difa:ʕan ʕani\_lwatʕan] ‘in defence of the homeland’, in which [i] is inserted after [ʕan]). The reason is that the word *istiqlāl* itself has an epenthetic initial glottal stop and vowel, pronounced in utterance-initial position as [ʔistiqla:l]. When preceded by the definite *al-*, the original form [ ] (i.e., the one with an initial consonant cluster) is retained and /i/ is inserted after the /l/ of *al-* to avoid a three-consonant cluster, leading to the pronunciation [ʔali\_stiqla:l]. When it occurs in middle position, the word is pronounced [li\_stiqla:l], without glottal stop



and vowel, and, more importantly, without an initial consonant cluster. When it is preceded with a word ending in a consonant, there is no possibility of a middle three-consonant cluster that requires vowel insertion. This rule seems to be ignored in many transcriptions and transliterations. For instance, Haywood and Nahmad (1965, p. 45) insert the vowel *-i* before the definite article, even though it is attached to the word *ijtimā'*, which, in isolation, starts with an epenthetic glottal stop. Accordingly, “*ḥaḍara Ḥassanuni l-ijtimaʿa*” ‘Hassan attended the meeting’ (Haywood & Nahmad, 1965, p. 45) should be transliterated as *ḥaḍara Ḥasanun l-ijtimaʿa* (using Haywood & Nahmad’s convention).

Another point of difference is shown by example (1d), where a long vowel freely occurs before the definite article (i.e., [ʔila: listiqla:l] ‘to independence’). This long vowel is shortened if the definite article is attached to a consonant-commencing word (cf., [ʔila\_lwatʕan] ‘to the homeland’). This further confirms that words commencing with an epenthetic, non-phonemic glottal stop behave differently from words that start with a phonemic glottal stop in the middle of an utterance—a fact that should be reflected in the transliteration and phonemic transcription of Arabic words.

The rule of [ʔ]+V epenthesis works not only for the definite *al-*, but also for any word that begins with an initial consonant cluster. The *st-*morpheme of Verb Form X is a clear example, as in utterance-initial position it results in the impermissible form /staʕʕala/, for which the vowel /i/ and the glottal stop must be added, leading to words like [ʔistaʕmala] ‘he used’. Epenthesis also applies to the imperative of many verbal forms, including trilateral verbs. The imperative in MSA is generally formed by deleting the prefix indicating the present (or “imperfective”) from the verb and changing its ending into jussive. Thus, from /ja-rkud<sup>ʕ</sup>-u/ (3SG.PRS-run-IND ‘he runs; he is running’), the imperative is formed by deleting the present-indicating prefix /ja/ and using the jussive, leaving the form /rkud<sup>ʕ</sup>/ ‘Run!’, which needs vowel and glottal stop epenthesis if it occurs in utterance-initial position (i.e., [ʔurkud<sup>ʕ</sup>]). The kind of epenthetic vowel depends on the vowel after the consonant cluster; if it is /u/, then the epenthetic vowel is /u/, as in the example above, but if it is /a/ or /i/, the epenthetic vowel is /i/; thus, in utterance-initial position, \*/fraḥ/ ‘Rejoice!’ becomes [ʔifraḥ] and \*/χtim/ ‘Stamp!’ becomes [ʔiχtim]).

This point can be further illustrated by investigating the way Arabic naturalizes loanwords that begin with a consonant cluster. In pronouncing

such words in utterance-initial position, Arabic speakers tend to insert an epenthetic vowel before the cluster, preceded by a glottal stop (e.g., [ʔista:d] ‘stadium’). In the middle of an utterance, the basic form of the word (i.e., the one without epenthetic vowel and glottal stop) is retained and linked to the preceding vowel, which is then shortened if it is a long vowel (e.g., ‘*alā istād al-Qāhirah* ‘on Cairo Stadium’ is pronounced [ʕala\_s̄ta:di\_lqa:hirah]), or an epenthetic short vowel is inserted if the preceding word ends in a consonant (e.g., *al-jamāhīr mala’at istād al-Qāhirah* ‘the-masses filled Cairo Stadium’, pronounced [ʔaldzama:hi:ru malaʔati\_s̄ta:da\_lqa:hirah]). When the definite *al-* is attached to such loanwords, the pronunciation of the resultant word behaves in the same way as in (1) above. This is illustrated by the examples in (2), which show the pronunciation of the word in initial position (2a), after a consonant (2b), after a short vowel (2c), and after a long vowel (2d). Few loanwords are written with a *hamza* and pronounced with a glottal stop followed by a vowel, even in middle position, such as ‘*ablakāsh* (from French *placage* ‘plywood’). When prefixed with the definite *al-*, it is pronounced [ʔalʔablaka:ʃ] ‘the plywood’ in initial position and behaves like any consonant-commencing word in different positions.

- (2)
- a. [ʔali-stira:ti:dzijja-t-u ʃ-ʃa:mila-h]  
ART-strategy-F-NOM ART-comprehensive-F  
‘the comprehensive strategy’
  - b. [nadwa-t-un ʕan li-stira:ti:dzijja-h]  
symposium-F-INDF about ART-strategy-F  
‘a symposium about strategy’
  - c. [tat<sup>s</sup>bi:q-u li-stira:ti:dzijja-h]  
application-NOM ART-strategy-F.GEN  
‘application of the strategy’
  - d. [ha:ðihi: li-stira:ti:dzijja-h]  
this.F ART-strategy-F  
‘this strategy’

## 2.2 Conjunctive and Disjunctive *Hamzas*:

The distinction between phonemic and epenthetic glottal stops can be related to the traditional distinction between *hamzat al-qaf*<sup>c</sup> (disjunctive *hamza*) and *hamzat al-waṣl* (conjunctive *hamza*), which is essentially a phonological distinction that is reflected in MSA orthography. In Arabic script, the *hamza* is the sign for the glottal stop, and the term “disjunctive *hamza*” is used to refer to a glottal stop that is always pronounced, irrespective of its position in the utterance, as opposed to the “conjunctive

*hamza*,” which is pronounced in utterance-initial position but dropped in the middle of the utterance. In strict Arabic orthography, a disjunctive *hamza* is indicated by the *hamza* symbol (ء) above or below the letter ‘*alif*’ (أ or إ) or by the *madda* sign seated above the ‘*alif*’ (آ), whereas a conjunctive *hamza* is usually symbolized by a bare ‘*alif*’ (ا) or, less frequently, an ‘*alif*’ with a breve (ا̇) or with a vowel sign (إ, إ, إ). These orthographic conventions correspond to the pronunciation of the glottal stop in each type. The symbol commonly used for the transliteration of the *hamza* is (ʾ).

### 3. The Epenthetic Glottal Stop as a Non-phonemic Sound:

The argument put forward above is that a word-initial glottal stop which is an integral part of the root of the word or a prefix attached to it is phonemic, while an epenthetic glottal stop is non-phonemic. This argument is supported by different types of evidence, including near-minimal pair tests, views from cognitive phonology, and comparisons with English vowel-commencing words.

#### 3.1 Near-minimal Pair Evidence

Near-minimal pairs have been generally defined as “pairs which would be minimal except for some evidently irrelevant difference” (Hayes, 2009, p. 36). It is generally accepted that, like minimal pairs, near-minimal pairs can be used to discover contrastive phonemes in a language. Gordon, for instance, notes that near-minimal pairs are “usually sufficient to demonstrate that two sounds are separate phonemes in a language” (2014, p. 62; see also Davenport & Hannahs, 2005, p. 118; Kennedy, 2017, p. 117). As Hayes (2009) observes, in order to use near-minimal pairs as evidence for the presence of different phonemes in a given language, it is necessary to accumulate relevant forms and exclude possible explanations of allophonic variation. This method is used here because there are no strict minimal pairs between the sounds in this combination, where one item of the pair has an extra phoneme (the glottal stop /ʔ/).

MSA has near-minimal pairs contrasting vowel and glottal stop plus vowel in word-initial position, though discovering them is not always a straightforward task. An example is /ʔalba:n/ ‘dairy foods’ (plural of *laban* ‘milk’) and /alba:n/ ‘the ben-tree’. The two words differ only in the presence of the /ʔ/ phoneme in the former item, and this is what makes the difference in meaning. The word /ʔalba:n/ can also mean ‘Albanian people’ if transliterated as ‘*Albān*’, though the two words are homographs in Arabic script, where there are no capital letters to mark proper nouns or adjectives. The ben-tree is a tree whose branches are known for their straightness,

tenderness, and beauty, which is why Arab poets traditionally likened tall, tender girls to ben-tree branches. This and other pairs given here resemble English near-minimal pairs like /fa:m/ and /a:m/ or /beg/ and /eg/, where the presence of an extra sound before the vowel is contrastive. Examples (3–5) below show similar near-minimal pairs contrasting words with a non-epenthetic glottal stop, shown in (a), and an epenthetic glottal stop, shown in (b).

- (3) a. /ʔalba:b/  
mind.PL.INDF  
'minds' (plural of *lubb* 'mind')
- b. /al-ba:b/  
ART-door  
'the door'
- (4) a. /ʔalʁa:z/  
mystery.PL.INDF  
'mysteries' (plural of *luḡz* 'mystery')
- b. /al-ʁa:z/  
ART-gas  
'the gas'
- (5) a. /ʔalħa:n-a-h/  
melody.PL-ACC-3SGM.POSS  
'his melodies (accusative case)' (plural of *laħn* 'melody')
- b. /al-ħa:na-h/  
ART-wine.shop-F  
'the wine-shop'

In each of examples (3–5) above, the two words have the same pronunciation if pronounced in utterance-initial position or in isolation (e.g., [ʔalba:n]). However, in utterance-medial position, the two pronunciations will be different (e.g., [muntadʒa:tu ʔalba:n] 'dairy products' as opposed to [ka\_lba:n] 'like a ben-tree branch'). The disappearance of [ʔ] in the latter case without changing the meaning indicates that it is not a contrastive phoneme in this context (i.e., [ʔalba:n] in initial position has the same meaning as [alba:n] in middle position). This is further illustrated by examples (6) and (7).

- (6) a. [ʔalba:b-u\_n-na:s]  
mind.PL-NOM ART-people.GEN  
'people's minds'
- b. [ħa:kaða: ʔalba:bu\_nna:s]

- (7) a. such mind.PL-NOM ART-people.GEN  
 ‘such are people’s minds’  
 [ʔal-ba:b-u maftu:h]  
 ART-door-NOM open.NOM  
 ‘the door is open’
- b. [ha:ða l-ba:b-u maftu:h]  
 this.M ART-door-NOM open.NOM  
 ‘this door is open’

Similar near-minimal pairs also exist at the phrase level, as in /ʔin faʕala/ ‘if he-did’ as opposed to /infaʕala/ ‘he-became-nervous’ as well as a whole range of forms along the same pattern, where the conditional ‘if’ plus a three-root verb can be contrasted with Verb Form VII (*infa’ala*) derived from the same trilateral verb, which is often used for the ergative. This productive pattern works equally for masculine, feminine, singular, dual, or plural verb forms, leading to near-minimal pairs in all cases, as illustrated in examples (8–10). Phrases are occasionally used as minimal or near-minimal pairs to show which sounds are phonemes in a language (e.g., Cruttenden, 2014, p. 317).

- (8) a. /ʔin saħaba/  
 if draw.PST.3SG.M  
 ‘if he drew’
- b. /insaħaba/  
 draw.ERG.PST.3SG.M  
 ‘he withdrew’
- (9) a. /ʔin hazama-t/  
 if defeat.PST.3SG-F  
 ‘if she defeated’
- b. /inhazama-t/  
 defeat.ERG.PST.3SG-F  
 ‘she was defeated’
- (10) a. /ʔin kasar-u/  
 if break.PST-3PL.M  
 ‘if they broke’
- b. /inkasar-u/  
 break.ERG.PST-3PLM  
 ‘they were broken’

Again, as shown by the following phonetic transcription, in utterance-initial position, the items in each pair will be pronounced

similarly (as in 11a and 12a), though in utterance-medial position the glottal stop and vowel will either be retained (as in 11b) or omitted (12b).

- (11) a. [ʔiŋ kasar-u:                      ʕu:d-a:]  
           if        break.PST-3PL.M                stick.SG.INDF-ACC  
           ‘if they broke a stick’  
       b. [la:kin ʔiŋ kasar-u:                ʕu:d-a:]  
           but        if        break.PST-3PL.M        stick.SG.INDF-ACC  
           ‘but if they broke a stick’
- (12) a. [ʔiŋkasar-u:]  
           break.ERG.PST-3PL.M  
           ‘they were broken’  
       b. [la:kini\_ŋkasar-u:]  
           but                      break.ERG.PST-3PL.M  
           ‘but they were broken’

Another pattern is associated with glottal-stop-commencing nouns and trilateral imperative verbs. Pairs belonging to this pattern are rare and need the right contextualization to see how they contrast. For instance, the noun /ʔins/ ‘humans’ and the verb /ins/ ‘forget’ (imperative, with a masculine singular addressee) are near-minimal pairs, since the presence/absence of the glottal stop makes a difference in meaning. In initial position, the words /ʔinsahum/ ‘the-humans-of-them’ and /insahum/ ‘Forget-them!’ have the same pronunciation, which can be transcribed phonetically as [ʔinsahum]. In middle position, there are two pronunciations, each corresponding to one meaning, as in [ʔamara\_ħa:hu ɣalqahu: dʒami:ʕan ʔinsahum wadzinnahum] ‘God commanded all His-creation, the-humans-of-them and-the-jinn-of-them’, as opposed to [bali\_nsahum] ‘Rather, forget them!’. A similar example is the noun /ʔirθ/ ‘inheritance’ and the verb /irθ/, imperative of /raθa:/ ‘lament; mourn’. For instance, /ʔirθi:/ ‘my inheritance’ contrasts with /irθi:/ ‘lament; mourn’, used for a singular feminine addressee. The pronunciation of the words in this last pair in initial position and in the middle of speech is shown in (13) and (14).

- (13) a. [ʔirθ-i:]  
           inheritance-1SG.POSS  
           ‘my inheritance’  
       b. [ha:ða:        ʔirθ-i:]  
           this.M            inheritance-1SG.POSS  
           ‘this is my inheritance’

- (14) a. [ʔirθ-i:      ħað<sup>ʕ</sup>ð<sup>ʕ</sup>-a-ki]  
 mourn.IMP-F luck-ACC-2SGF.POSS  
 ‘lament your luck’
- b. [bali      rθ-i:      ħað<sup>ʕ</sup>ð<sup>ʕ</sup>-a-ki]  
 rather      mourn.IMP-F luck-ACC-2SGF.POSS  
 ‘rather, lament your luck’

The above near-minimal pairs confirm that, at the phonemic level, there are cases in which the initial glottal stop in MSA is a contrastive phoneme that remains without change in any position in the utterance, while there are other cases in which it is a non-phonemic sound whose disappearance does not affect the meaning. The question may arise whether there are similar minimal pairs involving the epenthetic vowel. In this case, a full minimal pair can be obtained by keeping the glottal stop as a constant and altering the vowel. This will normally change the meaning, which indicates that the vowel in question is phonemic. Examples include [ʔurkud<sup>ʕ</sup>] ‘Run!’ as opposed to [ʔarkud<sup>ʕ</sup>] ‘I run (jussive)’, [ʔistamarra] ‘he continued’ as opposed to [ʔastamarra] ‘did he continue?’, and [ʔid<sup>ʕ</sup>rib] ‘Hit!’ as opposed to [ʔad<sup>ʕ</sup>rib] ‘Strike! Go on strike!’. This suggests that the epenthetic vowel is contrastive and should be represented in phonemic transcription, unlike the epenthetic glottal stop. In utterance-initial position, the words with an epenthetic vowel above can be phonemically transcribed as /urkud<sup>ʕ</sup>/ ‘Run!’, /istamarra/ ‘he continued’, and /id<sup>ʕ</sup>rib/ ‘Hit!’.

### 3.2 The Epenthetic Glottal Stop in English and Arabic:

Many phonologists assume that an English syllable need not have an onset, based on the idea that an English word can start with a vowel, and that, in utterance-initial position, this vowel is the first segment that an English speaker pronounces (e.g., Gut, 2009; Mompean, 2014). When giving examples of the glottal stop in English, phonologists tend to use paralinguistic forms, such as the cough sound, [ʔʌhəʔʌh] (Jones, 1972, p. 150), [ʔmʔm] (Gussenhoven & Jacobs, 2017, p. 23), or *uh-oh* [ʔʌʔəʊ] (Hayes, 2009, p. 3), which may suggest that the sound is rare in other, linguistic, forms. It is sometimes noted that the glottal stop occurs in the second syllable of the form *uh-oh* (e.g., Gordon, 2014, p. 28; Hayes, 2009, p. 3), thus implying that it does not occur in the first syllable. The other type of glottal stop examples commonly cited for English is of vowel-initial words to which a vowel-final prefix is attached, as in *co-operate* [kəʊʔəpəreit] or *reaction* [ri:ʔəkʃən] (Cruttenden, 2014, p. 138), the

implication here being that the stems by themselves do not start with a glottal stop if pronounced in isolation.

Though the glottal stop does not have the status of a phoneme in English, it occurs in some dialects as an allophone of certain sounds in certain phonological contexts. However, the glottal stop seems to be more common in English speech than is generally recognized. Välimaa-Blum (2005, p. 159) speaks of “the intrusive glottal stop”, which is inserted at the beginning of vowel-commencing words, such as *out* (when pronounced [ʔaʊt]), or stems, as in *re-align* (when pronounced [ri:ʔəlain]). Gussenhoven and Jacobs (2011, p. 164) also refer to the pronunciation of the glottal stop before word-initial vowels in languages that do not have a glottal stop in their phonemic inventory, including English, illustrating their point by the expression *How awful!*, where the first syllable of the word *awful* is preceded by a glottal stop. The onset requirement seems to apply to English just as it applies to Arabic. Taylor (2002, p. 88) uses the term “filled-onset requirement” to refer to the phenomenon of inserting a consonant before vowel-commencing words in languages like English. According to this requirement, if a given word starts with a vowel sound, some consonant must be used to fill in the onset position. As Taylor puts it:

This requirement is so powerful that English speakers find it difficult to articulate as isolated vowel, such as [i:], without using a glottal stop to provide the syllable with an onset: [ʔi:]. For many English speakers, [i:] is simply not pronounceable. (2002, p. 88)

In utterance-initial position, English vowel-commencing words are normally pronounced with a glottal stop before the vowel. This is quite natural since no other strategy (e.g., liaison, intrusive /r/ insertion, or semi-vowel insertion) can work in this environment. The difficulty that native speakers of English generally find in perceiving the [ʔ] in word-initial position can be attributed to the fact that the glottal stop is not a phoneme in the English language. This point is further affirmed by Lombardi (2002), who observes that “English has epenthesis of glottal stop after pause, and no real vowel-initial words in that environment” (p. 228), showing that “phrase-internally” (i.e., in the middle of an utterance), glottal stop epenthesis can occur in the case of emphasis, as in *the eel*, when pronounced [ðɪ ʔi:l]. Lombardi (2002) also shows that the epenthetic glottal stop is commonly used before word-initial vowels across languages from diverse genetic origins, including Arabic, Czech, Dutch, German, Indonesian, Kisar (an Austronesian language), and Malay.



A cognitive approach to phonology, especially a usage-based one, can provide some explanation for such phenomena. The relationship between language knowledge and language usage is reciprocal; not only is our usage of language based on our knowledge of it, but such knowledge is itself the product of usage (Mompean, 2014, p. 267). Phonemes that are not part of the inventory of a given language can be hard to recognize without some training, even though the sounds may constitute allophonic variations in the relevant language. One of the principles of cognitive phonology is that “the sound structure of a language is based in the articulatory possibilities of the human vocal apparatus” (Taylor & Littlemore, 2014, p. 14). This principle can account for the insertion of a glottal stop before vowel-commencing words in utterance-initial position, which has to do with the pronounceability of vowels in such position. It is plausible to assume that a vowel cannot be easily pronounced in isolation or at the beginning of an utterance, and that a consonant (functioning as a syllable onset) should be added to permit its pronunciation, which suggests that the onset constraint is probably universal. This consonant, in utterance-initial position, is commonly the glottal stop, and this probably applies to English just as it applies to Arabic.

If this is the case with English as well as Arabic, then there is reason to wonder why it is claimed that Arabic is a language whose syllables must start with a consonant while English is a language in which a syllable can start with a vowel. If this claim is based on the phonetic realization of vowel-commencing words in utterance-initial position, then, as has been seen, it can equally be claimed that English is also a language in which syllables cannot start with a vowel, i.e., the V, VC, or VCC syllable structures are also not permitted in English (provided, of course, that this applies to phonetic, or allophonic, realizations). If the claim is based on the phonemic inventory of Arabic, in which the glottal stop is a member, then the claim is incomplete, since there are a large number of words in MSA in which the initial glottal stop is not part of the phonemic structure of the word, or “not a ‘real’ consonant” as Daniel (2013, p. 417) puts it, but is inserted to fill in the onset position (see also Bateson, 2003; Nathan, 2008; Prince & Smolensky, 2004; Ryding, 2014). The criteria for describing English and Arabic words with an epenthetic glottal stop should be the same.

A non-native speaker learning a given language may find it hard not only to produce, but also to recognize, sounds that are not part of the phonemic inventory of his/her native language. For instance, many Arab

learners of English find it difficult to distinguish between the vowel and diphthong in *law* and *low*, though for a native speaker of English the difference is very obvious. Some Arab learners of English may also use /b/ for /p/ and may not realize that they use [p] as an allophone for /b/ in Arabic in certain contexts, as in *kabt* (suppression), where the /b/ occurs immediately before a voiceless consonant, leading to [kapt] in some pronunciations. Similarly, some English learners of Arabic cannot recognize word-initial glottal stops, and may hear Arabic words like *'umm* (mother) as commencing with a vowel rather than a glottal stop.<sup>3</sup> Many speakers of English do not even realize that they do produce the glottal stop, which is not phonemic in their own language, in utterance-initial position and in certain contexts in medial position.

It may be relevant in this context to compare the Arabic and English pronunciations of words that have some common origin in the two languages, including proper names such as *Adam*, *Albania*, *America*, *Apollo*, *Eritrea*, *Iran*, *Israel*, *October*, *Oscar*, or *Uzbekistan*. For an Arab ear, all these words have the same initial sound, the /ʔ/ sound, when pronounced in isolation, whether in English or in Arabic. It is also possible to consider English borrowings from Arabic that begin with a vowel, such as *Allah*, *alcohol*, *algebra*, or *elixir*. Even though an English speaker would pronounce the initial syllables of these words in utterance-initial position in basically the same way as an Arabic speaker does (i.e., with an initial glottal stop; see, e.g., Lombardi, 2002; Taylor, 2002), no glottal stop is represented in the phonemic transcription of such English words (see, e.g., Jones, 2011). Since in Arabic none of the above words starts with a phonemic glottal stop, there is no reason why the same procedure should not be adopted when representing Arabic words.

This point is further supported by the lack of reference in the literature on errors made by Arab learners of English to the practice of beginning English vowel-commencing words with a glottal stop in utterance-initial position. It is true that some studies refer to the tendency of some Arab learners to insert a glottal stop before vowel-commencing words, but such studies are concerned with their occurrence in the middle of utterances (e.g., Jenkins, 2000, p. 117). Similarly, Khalifa's (2018, p. 109) observation that Cairene learners of English are likely to insert a glottal stop before English vowel-commencing words can only be understood as referring to utterance-medial position. Unless done

<sup>3</sup> See, e.g., <https://linguistics.stackexchange.com/questions/26432>.

consistently, this could not be considered an error, as there are cases where native speakers of English do the same for different purposes, including emphasis and disambiguation, as seen above. If pronouncing a glottal stop by Arab learners was so noticeable before vowels in utterance-initial position, it would at least occupy a larger space in the literature. Nor do we find references to speakers of English learning Arabic making errors in the pronunciation of initial glottal stop under the influence of the phonological patterns of English. This is probably an indication that vowel-commencing words are pronounced similarly in utterance-initial position in both English and Arabic.

### 3.3 Romanization of Word-Initial Glottal Stops:

In the light of the above account, some general principles can be set for representing word-initial glottal stops in different romanization methods, both in utterance-initial and in utterance-medial positions. First, a glottal stop that is an integral part of a word root or a prefix (represented by a disjunctive *hamza* in Arabic orthography) is phonemic; it should be attested in transliteration, phonemic transcription, and phonetic transcription. Second, an epenthetic glottal stop (corresponding to a conjunctive *hamza*) is non-phonemic. It should not be represented by a *hamza* sign in transliteration, nor by a glottal stop sign in phonemic transcription, whether it occurs in utterance-initial or in utterance-medial position. In phonetic transcription, it should be represented by the glottal stop sign in utterance-initial position (or when representing speech that violates MSA pronunciation rules). This proposed romanization is illustrated in Table (1).

Table 1  
*Romanization of Phonemic and Epenthetic Glottal Stops in Utterance-Initial and Utterance-medial Position*

Kind of Word	Transliteration	Phonemic Transcription	Phonetic Transcription
In Utterance-Initial Position			
Phonemic Glottal Stop	<i>'ummah</i> (a-nation)	/ʔummah/	[ʔummah]
Epenthetic Glottal Stop	<i>ithnān</i> (two)	/iθna:n/	[ʔiθna:n]
In Utterance-medial Position			
Phonemic Glottal Stop	<i>al-'ummah</i> (the-nation)	/alʔummah/	[ʔalʔummah]
Epenthetic Glottal Stop	<i>al-ithnān</i> (the-two)	/aliθna:n/	[ʔaliθna:n]

In addition, when a word with a conjunctive *hamza* occurs in utterance-medial position, it regains its basic form (i.e., the form without epenthetic vowel and glottal stop), and thus starts with a consonant cluster.

It can affect the pronunciation of the last sound of the preceding word in different ways, depending on the final sound of the preceding word. There are three possibilities in this respect:

(1) If the preceding word ends in a consonant, a short vowel (usually /i/, but also /u/ and /a/) must be inserted after the consonant to prevent the occurrence of a three-consonant cluster. The choice of the vowel has lexical and morpho-phonemic constraints, as shown below.

a. In most cases, the vowel inserted is /i/; for example, if /qa:lat/ ‘she said’ is followed by a word starting with a conjunctive *hamza*, an /i/ is inserted, as in /qa:lati\_ḷbint/ ‘the girl said’. The /i/ vowel is also used if the preceding word ends in the /n/ of nunation, or *tanwīn* (e.g., /ʕa:mun/ ‘one year’ is followed by /i/ in /ʕa:muni\_taha:/ ‘one year has ended’). This also applies if a conjunctive *hamza* is preceded by the definite article *al-* (as in /ali-stiʕma:r/ ‘the-colonization’).

b. The vowel can also be /u/. This occurs, for instance, after the pronouns /hum/ ‘they (3PL.M)’ and /ʔantum/ ‘you (2PL.M)’ (e.g., /ʔantum\_u\_ḷmasʔu:lu:n/ ‘you are the responsible ones’), or if the word preceding the initial consonant cluster ends in the 2PL.M suffix *-m* (e.g., /qultum/ ‘you said’ in /qultumu\_ḷhaqi:qah/ ‘you said the truth’) or in the 3PL.M suffix *-w* when preceded by the vowel /a/ (e.g., /talaqqaw/ ‘they received’ in /talaqqawu\_ḷʕilm/ ‘they received knowledge’).

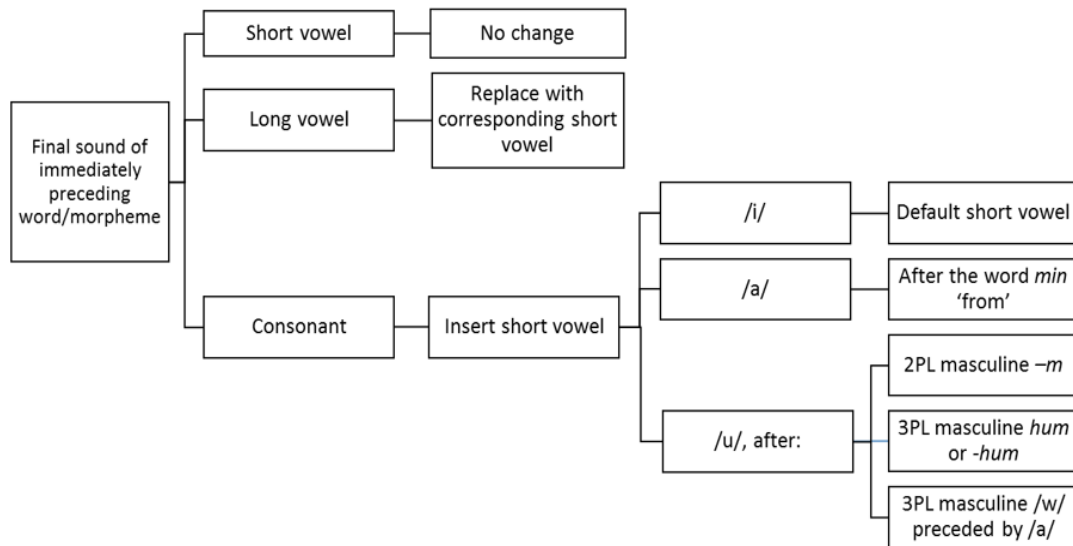
c. The /a/ sound is inserted after the preposition /min/ ‘from’ (e.g., /mina\_bnatih/ ‘from his daughter’).

(2) If the preceding word ends in a long vowel, it is replaced with the short form of the same vowel. For example, the final vowel in /fi:/ ‘in’ is shortened if linked to a word starting with a conjunctive *hamza*, as in /fi\_ḷhaqi:qah/ ‘in fact’. Similarly, the /a:/ of /ʕala:/ is shortened in the phrase /ʕala\_ḷhawa:ʔ/ ‘on air’.

(3) If the preceding word ends in a short vowel, no change is involved. An example is /qa:la/ ‘he said’ in /qa:la\_ḷhaqi:qah/ ‘he said the truth’. This rule also applies if an initial consonant cluster is preceded by a monosyllabic function word ending in a vowel, such as the prepositions /bi/ ‘with, by, at’, /li/ ‘for, to’, and /ka/ ‘as’ (e.g., /listiθma:r/ ‘for investing’), the emphatic particle /la/ (e.g., /laʕtarafa/ ‘he would really confess’), or the coordinating conjunction /wa/ ‘and’ (e.g., /wastiqrariha:/ ‘and its stability’). Since the orthographic conventions of Arabic do not permit a single letter to stand alone, the above function words are always attached to lexical words. In transliteration, hyphens are normally used to separate them, though in transcription they can be joined, as in the examples above, or can be separated by a space if this is relevant to the

analysis. If the latter method is adopted, the undertie symbol can be used to show linking in pronunciation (e.g., /li<sub>~</sub>stiθmar:/, /la<sub>~</sub>ʃtarafa/, and /wa<sub>~</sub>stiqrariha:/). These different possibilities are illustrated in Figure 1.

Figure 1  
Effect of Initial Consonant Cluster on Preceding Sound in Utterance-Medial Position



#### 4. Examples of transcription and transliteration problems:

Though the above transliteration and transcription procedures seem obvious and straightforward, investigating the way *hamzas* are actually transliterated or transcribed in authentic publications reveals some problems and inconsistencies. The material investigated is drawn from major references in phonology and Arabic language teaching, in addition to two widely used transliteration systems. An attempt is made to explain some common romanization practices with reference to Arabic orthographic conventions and phonotactic rules.

##### 4.1 The IPA Handbook:

The *Handbook of the International Phonetic Association* (IPA, 1999) is mainly intended as “a practical guide to the IPA [International Phonetic Alphabet] and to the conventions associated with it” (p. 3) through illustrations showing the use of IPA symbols in various languages. Like most other illustrations, that of Arabic (Thelwall & Sa’adeddin, 1999) contains a transcription of a translation of a short English fable entitled

“The North Wind and the Sun,” using the IPA symbols. This ten-line transcription (Figure 2) is examined below to see how glottal stop-commencing words are transcribed in utterance-initial and utterance-medial positions, with reference to the audio files of the recordings on which the transcription is based<sup>4</sup>. The transcription is clearly phonemic, since no allophonic variations of phonemes are represented.

Figure 2

Transcription of Arabic in the *Handbook of the International Phonetic Association* (1999, pp. 53-54; line numbers have been added for ease of reference)

1	kaanat rijhu ʃʃamaali tatadʒaadalu wa ʃʃamsa fij ʔajjin minhumaa kaanat
2	ʔaqwaa min alʔuxraa, wa ʔið bi-musaafirin jatʔluʃu mutalaffiʃan bi-
3	ʃabaaʔatin samijka. fa tafaqataa ʃalaa ʃtibaari ssaabiqi fij ʔidʒbaari
4	lmusaafiri ʃalaa xalʃi ʃabaaʔatihi lʔaqwaa. ʃasʔafati rijhu ʃʃamaali bi-
5	ʔaqsʔaa ma statʔaaʃat min quwwa. wa laakin kullumaa zdaada lʃasʔf
6	izdaada lmusaafiru tadaʔʔʔuran biʃabaaʔatih, ʔilaa ʔan ʔusqitʔa fij jadi
7	rrijh fa taxallat ʃan muhaawalatihaa. baʃdaʔiðin satʔaʃati ʃʃamsu bi-
8	difʔihaa, fa maakaana min almusaafiri ʔillaa ʔan xalaʃa ʃabaaʔatahu
9	ʃalaa ttauw. wa haakaða idʔʔʔurat rijhu ʃʃamaali ʔilaa liʃtiraafi biʔanna
10	ʃʃamsa kaanat hija lʔaqwaa.

كانت ریح الشمال تتجادل والشمس في أي منهما كانت أقوى من الأخرى. وإذ بمسافر  
يطلع متلعباً بعباءة سمیكة . فاتفقنا على اعتبار السابق في اجبار المسافر على خلع عبائه  
الأقوى . عصفت ریح الشمال بأقصى ما استطاعت من قوة . ولكن كلما ازداد العصف  
ازداد المسافر تدثراً بعبائه الى ان أسقط في يد الریح فتخلت عن محاولتها . بعدئذ سطعت  
الشمس بدفئها فما كان من المسافر الا ان خلع عبائه على التو . وهكذا اضطرت ریح  
الشمال الى الاعتراف بان الشمس كانت هي الأقوى .

Examining the ten-line transcription reveals a number of problems related to the representation of words with initial consonant clusters in utterance-medial position. As noted above, the presence of a word with an initial consonant cluster in middle position can affect the pronunciation of the immediately preceding word in different ways, depending on whether the preceding word ends in a consonant or a vowel, and whether the vowel in the latter case is long or short. In the transcription shown in Figure 2, the rule requiring vowel shortening is followed in the sequence /ma statʔaaʃat/ ‘as it could’ (line 5), whose component words would be transcribed separately as /maa/ and /istatʔaaʃat/.<sup>5</sup> However, this rule is not observed in similar sequences in the passage, such as /ʃalaa ʃtibaari/ ‘on considering’ (line 3), which should be transcribed as /ʃala ʃtibaari/, as it is actually

<sup>4</sup> Downloadable from: <https://www.internationalphoneticassociation.org/content/ipa-handbook-downloads>.

<sup>5</sup> This version of the IPA represents long vowels by /aa/, /ij/, and /uw/.

pronounced in the recorded file (narrative 3). The same is repeated in /kullamaa zdaada/ ‘the more he increased’ (line 5) and /ʕalaa ttaw/ ‘on the spot’ (line 9), which should be transcribed as /kullama zdaada/ and /ʕala ttaw/, as the two phrases are pronounced in the recording (narratives 5 & 7).

There are also problems with the transcription of the definite *al-*, whose epenthetic vowel is retained in two instances (namely, “min alʔuxraa” ‘than the other’, line 2, and “min almusaafiri” ‘from the traveller’, line 8). This representation is rather inaccurate, since the /a/ sound is not part of the definite *al-*, whose /a/ sound is elided in utterance-medial position, but a vowel that has been added to the final consonant of /min/ to prevent the occurrence of a medial three-consonant cluster (\*/min lʔuxraa/ and \*/min lmuʕaafiri/). This claim can be easily verified by placing *min* before a word that starts with a conjunctive *hamza* followed by an /i/ vowel, such as /istiθma:r/, ‘investing’, where the resulting sequence will be pronounced as /mina stiθma:r/ ‘from investing’, not \*/mini stiθma:r/. This is indeed how a similar pattern in the same passage is transcribed, namely, “saṭʕaṭi ʕʕamsu” ‘the Sun shone’ (line 7), in which the /i/ has been inserted after /saṭʕaṭ/ to avoid the three-consonant cluster /-t ʕʕ-/, which is not permissible in MSA. To further complicate matters, the /i/ vowel has been unnecessarily inserted after the /t/ in the sequence “ʕasʕafati rijhu ʕʕamaali” ‘the North Wind blew’ (line 4), which is inaccurate since the immediately following word (/rijhu/ ‘wind’) does not start with a consonant cluster, and the sequence should be transcribed as /ʕasʕafat rijhu ʕʕamaali/ (narrative 4 in the recording).

Other inaccuracies in this transcription include the omission of gemination of /t/ in “fa tafaqataa” ‘so they agreed’ (line 3), which should be transcribed as /fa ttafaqataa/. The verb *ittafaqa* is a Form VIII verb to which an epenthetic glottal stop and a vowel are added in utterance-initial position, but not in middle position, where the initial consonant cluster (represented by /tt/) should be retained. There is another omission of gemination of /r/ in “idʕʕurat” ‘was obliged’ (line 9), which is pronounced /idʕʕurrat/ in the recording (though, according to MSA morphophonemic rules, this passive Form VIII verb should be pronounced as /udʕʕurrat/). In addition, the word boundaries in “fa maakaana” ‘all that (someone) did’ (line 9), which, according to the conventions followed in the transcription of similar cases in the passage, should be /fa maa kaana/. Thelwall and Sa’adeddin (1990, p. 52) also use /ʔ/ in place of /ʕ/ in their transcription of the words *raw’ah* ‘splendour’ and *law’ah* ‘sorrow’, which they transcribe

with a glottal stop (i.e., /rawʔah/ and /lawʔah/ rather than /rawʕah/ and /lawʕah/). The transcription, which is clearly a typological error, was taken by Gussenhoven and Jacobs (2017, p. 38) as evidence supporting the view that, in Arabic, it is possible for the glottal stop to occur in the onset position in the middle of words, which is true, though the example they cite is irrelevant, as it should read /lawʕah/, with a pharyngeal approximant as onset of the second syllable, not a glottal stop. Though an “Arabic Revision” file has been issued by the IPA,<sup>6</sup> it has only addressed a misprint involving the use of /q/ in place of /θ/ in the word /tadaθθuran/.

#### 4.2 Arabic Language Textbooks:

Related issues and inconsistencies occur in the transliterations provided in Arabic language teaching textbooks written in English. For instance, in Haywood and Nahmad (1965) the sign for a disjunctive *hamza* is sometimes attested and sometimes dropped. In their discussion of broken plural patterns, Haywood and Nahmad attest the *hamza* symbol in the words *'anhurun* ‘rivers’ and *'arjulun* ‘feet’ and drop it in *'ashurun* ‘months’ and in *'afʕulun*, which is the pattern for these plurals (1965, p. 51). Haywood and Nahmad remove the conjunctive *hamza* sign in transliteration whenever the word occurs in utterance-initial position (which is the practice recommended here), but they also apply the same technique with disjunctive *hamzas*, as in using the form *as'ilatun* ‘questions’ (1965, p. 11) rather than *'as'ilatun* or *insānun* ‘a human being’ (p. 30) rather than *'insānun*.

Haywood and Nahmad also sometimes keep vowel length in words immediately preceding a conjunctive *hamza* in spite of omitting the symbol for the epenthetic vowel, as in the phrase *Ḥaḍarū l-majlisa* ‘They attended the assembly’ (1965, p. 61). The vowel of definite *al-* needs to be represented in transliteration (i.e. *Ḥaḍarū al-majlisa*), while the *-ū* should be shortened to *-u* in transcription (i.e., *ḥaḍaru l-majlisa*). Similar cases are encountered in Holes (2004), who adopts IPA symbols, with some modifications, in the “transliteration” of Arabic words and texts. While it is possible, in principle, to use the IPA symbols for transliteration, it is important to recall that transliteration, at least as the term is used here, aims to represent writing rather than pronunciation. In the passage shown in Figure 3, a pause is represented by the symbol {}, which helps clarify whether or not a given word is in utterance-initial position. Accordingly, the transcription of the word “*ʔistiqla:liha:*” ‘its independence’ in the

<sup>6</sup> Available at:

<https://www.internationalphoneticassociation.org/sites/default/files/handbookfiles/Arabic-Revision.pdf>.



phrase “*wa ‘an ʔistiqla:liha:’*” ‘and for its independence’ (line 1) is assumed to represent utterance-medial pronunciation. The noun *istiqlāl* ‘independence’, derived from Form X verb *istaqalla* ‘to be independent’, begins with a conjunctive *hamza*, which is not represented in Arabic script and should not appear in transliteration (if this is intended to be a transliteration). In addition, the initial glottal stop is not phonemic and, therefore, should not appear in phonemic transcription, either. The initial glottal stop and following vowel in the word *ʔistiqla:liha:* should not be represented in the middle of the utterance, just like other words with a conjunctive *hamza* in the passage, such as words starting with the definite *al-* (romanized, e.g., ‘*ilma lyaqi:n* ‘knowing for certain’, line 2, and *ha:ḏihi lʔahda:fi* ‘these aims’, line 4). Since it is not clear whether the romanization is intended to be a transliteration or a transcription of the MSA passage, there are two ways of representing the phrase. In the case of transliteration, the *hamza* symbol should be omitted, leading to *wa ‘an istiqla:liha:*, while, in transcription, the word-initial consonant cluster should be retained and a short-vowel be inserted, leading to *wa ‘ani stiqla:liha:* (using (:)) rather than (:) to indicate vowel length, as in original source).

Figure 3

Transliteration in IPA Symbols of a Short Arabic Passage (Holes, 2004, p. 64; line numbers have been added for ease of reference)

1	<i>ʔinna miṣr{} hi:nama: tuda:fi‘u ‘an ḥurri:yatiha: {} wa ‘an ʔistiqla:liha: {} wa tad‘u: li</i>
2	<i>ssala:m {} fa hiya ta‘lamu ‘ilma lyaqi:n {} ma: huwa lfarqu bayna ssala:mi wa listisla:m</i>
3	<i>{ } . . . ʔa‘lanat miṣr {} wa gami:‘u ʔabna:ʔi miṣr {} ʔinnaha: {} fi: sabi:li lmuḥa:fazati ‘ala:</i>
4	<i>ha:ḏihi lʔahda:fi lkubra {} satuqa:tilu fi: sabi:li ssala:m {} wa tuqa:tilu fi: sabi:li lḥurri:ya {}</i>
5	<i>wa tuqa:tilu fi: sabi:li listiqla:l {}</i>
	‘Egypt {} when it defends its freedom {} and its independence {} and calls for peace {} knows for certain {} what the difference is between peace and surrender {} . . . Egypt has made it clear {} as have all its sons {} that {} in order to safeguard these great aims {} it will fight for peace {} and fight for freedom {} and fight for independence {}’

Representing vowels before conjunctive *hamzas* seems to be a recurrent problem in Arabic language textbooks. Holes, for instance, romanizes the Arabic for ‘in the house’ as “*fi: l-bayti*” (2004, p. 395), where keeping the length of /i:/ implies that this is a transliteration of the Arabic phrase, while omitting the epenthetic glottal stop and vowel of the definite *al-* implies that it is a transcription. A more consistent

romanization is *fi*: *al-bayti* in the case of transliteration or *fi l-bayti* in transcription. Ryding (2014) also retains final long vowels before conjunctive *hamzas* in utterance-medial position. Examples are “*fii l-waqt-i nafs-i-hi*” ‘at the same time’ and “*ḥadar[sic]-uu l-muṭtamar-a*” ‘(they) attended the conference’ (p. 120). Using Ryding’s conventions, it is possible to transliterate these phrases as *fii al-waqt-i nafs-i-hi* and *ḥadar-uu al-muṭtamar-a*, or to transcribe them as *fi l-waqt-i nafs-i-hi* and *ḥadar-u l-muṭtamar-a*.

### 4.3 Transliteration Systems:

Different romanization systems adopt different ways of representing phonemic and epenthetic glottal stops. Some transliteration systems use the symbol of the *hamza* in all words starting with the letter ‘*alif*’ (e.g., ISO 233, 1984)<sup>7</sup>, while others omit it altogether, such as the IJMES and LOC systems. A representative example from IJMES is the transcription “*Al-‘Adāla al-Ijtimā‘iyya fī al-Islām*” ‘Social Justice in Islam’ (Shepard, 2003, p. 524), where the conjunctive *hamza* of *Ijtimā‘iyya* and the disjunctive *hamza* of ‘*Islām*’ are transliterated in the same way. Similarly, in the LOC system, the phrase *Kulliyat al-‘Ādāb* ‘the College of Arts’ is transliterated as *kulliyat al-Ādāb* (LOC, rule 10a), where the disjunctive *hamza* of the word ‘*Ādāb*’ (plural of ‘*‘adab*’) is transliterated in the same way as the conjunctive *hamza* of the definite *al-*. The omission of any sign for the glottal stop in word-initial position is common in Arabic textbooks intended for foreign learners.

The opposite practice of marking both types of *hamza* with the sign is also often encountered in the literature. In publications where no specific style is required for transliteration or transcription, the process of romanization seems to depend on authors’ personal preferences. Some authors consistently attest conjunctive *hamzas* in transcription and transliteration whether in utterance-initial or utterance-medial position (e.g., Nofal, 2012), while others use the symbol for the glottal stop /ʔ/ in the phonemic transcription of any glottal stop that is pronounced in utterance-initial position (e.g., El-Imam, 2004; Gadalla & Abdel-Hamid, 2000; Hassan, 2011; Heselwood & Al-Tamimi, 2011). Mitchell (1960, p. 370), who states that Classical Arabic syllables “must *ex hypothesi* begin with a consonant”, transliterates *inkasara* ‘to be broken’ with an initial *hamza* sign (i.e., ‘*inkasara*’), in the same way as ‘*adwiyatuhu*’ ‘his medicines’ (1960, p. 373), though the former (a Form VII verb) begins with

<sup>7</sup> See: <http://www.freeprotocols.org/content/republished/doc.public/standards/communication/iso/iso-233/iso-233-3.pdf>.

a conjunctive *hamza* and the latter with a disjunctive *hamza*. It is true that, in utterance-initial position, both types are pronounced with a glottal stop, but in Arabic script, which transliteration generally seeks to represent, the *hamza* sign is only attested in the disjunctive type.

#### 4.4 Possible Explanations

The practice of dropping any word-initial *hamza* in transliteration can be attributed to the fact that the initial *hamza* is often left out in non-strict Arabic orthography, under the assumption that an Arab reader would intuitively decide whether or not it is to be pronounced. Since transliteration generally seeks to represent spelling, some transliteration systems have adopted that practice, though this is not equally justified in Roman script transliteration, which is normally addressed to non-native speakers of Arabic. As suggested above, it is more helpful to follow a strict Arabic orthography by marking only the disjunctive *hamza* with the *hamza* sign. Ryding (2014) is critical of romanization in Arabic textbooks which do not observe this distinction. She consistently represents “word-initial non-elidable glottal stop with the symbol /ʔ/ because it forms either part of the lexical root or part of the pattern” (Ryding, 2014, p. 17), noting that failure to do so can blur the distinction between disjunctive and conjunctive *hamzas* (for which she uses the terms “strong” and “weak” *hamzas*, respectively).

In the case of transcription, there seems to be some lack of clarity about the meaning and range of application of the phonotactic rules related to syllable structure in Arabic, according to which no Arabic syllable can start with a vowel (e.g., Al-Ani, 1970; Holes, 2004; Mitchell, 1960, 1990; Nathan, 2008; Prince and Smolensky, 2004). This rule has sometimes been extended to transliteration, though it seeks to represent script rather than actual pronunciation, and to phonemic transcription, which represents contrastive phonemes. Many problems can be resolved by confining the representation of epenthetic glottal stop to phonetic transcription, and also by specifying the type of romanization adopted (e.g., by using slashes / / for enclosing phonemic transcription and square brackets [ ] for phonetic transcription).

The fact that an utterance-initial epenthetic vowel is normally preceded by a glottal stop can explain two opposing practices in the romanization of Arabic. The first is the practice of marking any such vowel with the symbol for *hamza* or glottal stop, because this is how the vowel is actually pronounced in such position. The second, which is more common,

is to omit the symbol for *hamza* or glottal stop altogether, assumedly because there is no need for such a symbol since the pronunciation will start with a glottal stop anyway. As is proposed here, there are cases in which the symbol for an initial glottal stop should be attested and other cases in which it should be omitted, depending on whether it is phonemic or non-phonemic, and depending on the kind of romanization required (transliteration, phonemic transcription, or phonetic transcription).

## 6. Conclusion

This study has argued that, in MSA, the glottal stop that is pronounced before vowels in utterance-initial position can be phonemic or non-phonemic, and that this distinction should be represented in different types of romanization. It is shown that a phonemic glottal stop is an integral part of the root of the word or a prefix attached to it, while a non-phonemic glottal stop is an epenthetic glottal stop added to facilitate pronunciation in utterance-initial position. The similarity between the two types is only superficial, and a deeper analysis is required before romanization to know the underlying status of the glottal stop. Evidence for this argument has drawn on near-minimal pairs, where the absence or presence of a word-initial glottal stop in middle position is contrastive, comparisons with English vowel-commencing words, and views from Optimality Theory and cognitive phonology.

The study has examined the romanization of word-initial glottal stops in a number of commonly used transliteration manuals and main references in phonetics and Arabic language teaching. The examination has revealed a number of recurrent problems, most notably dropping or attesting the glottal stop sign in both types in all positions and inconsistently representing the same type of glottal stop in similar positions. There are also problems with representing immediately preceding words when a word-initial consonant cluster occurs in utterance-medial position, without epenthetic glottal stop and vowel. These include keeping the final vowel long before the initial consonant cluster, unnecessarily inserting a vowel after the final consonant, or inserting a wrong vowel after the final consonant. Most of these problems can be avoided by deciding whether the glottal stop is phonemic or epenthetic and clearly specifying the kind of romanization being performed. In addition, the phonotactic rule stating that an Arabic syllable never starts with a vowel needs to be interpreted within this framework; it should not be applied to transliteration or phonemic transcription, neither of which seeks to reproduce the actual pronunciation of words. The similarity between

Arabic words with epenthetic glottal stop and English vowel-commencing words, which also start with an epenthetic glottal stop in utterance-initial position, indicates that there is need to revise the claim that Arabic is a language in which syllables must have an onset while English is a language in which syllables can start with a vowel. A more plausible view would be that the onset-filling principle applies to both languages, as shown in Section 3.2 above, where it is indicated that, in utterance-initial position, the onset in English vowel-commencing words can only be filled with a glottal stop. Needless to say, this applies to actual phonetic realization, not to the phonemic system of English.

It is hoped that the views proposed here will help achieve greater accuracy and consistency in romanizing different types of MSA glottal stop in utterance-initial and utterance-medial positions in scholarly work. It is also hoped that the suggestions offered will be of benefit to learners of Arabic and researchers working on the Arabic language, bearing in mind that such suggestions do not apply to other varieties of Arabic. Further research is needed to investigate the status of the initial glottal stop in colloquial Arabic dialects, which differ significantly from the standard variety discussed here.

**Appendix A**  
**Transliteration and Transcription Symbols**

Arabic character	Transliteration Symbol*	Phonemic Symbol**
I. Consonants		
ء	'	ʔ
ب	b	b
ت	t	t
ث	th	θ
ج	j	dʒ
ح	ħ	ħ
خ	kh	χ
د	d	d
ذ	dh	ð
ر	r	r
ز	z	z
س	s	s
ش	sh	ʃ
ص	ʂ	s <sup>ç</sup>
ض	ḍ	d <sup>ʕ</sup>
ط	ṭ	t <sup>ç</sup>
ظ	ẓ	ð <sup>ç</sup>
ع	'	ʕ
غ	gh	ʁ
ف	f	f
ق	q	q
ك	k	k
ل	l	l
م	m	m
ن	n	n
هـ	h	h
و	w	w
ي	y	j
II. Vowels		
اَ	a	a
اِ	ā	a:
اُ	u	u
و	ū	u:
ي	i	i
يِ	ī	i:

\* Based on the LOC romanization system, available at: <https://www.loc.gov/catdir/cpsa/romanization/Arabic.pdf>.

\*\* Based on the IPA system (IPA, 1999). The symbols /x/ and /ɣ/ (voiceless and voiced velar fricatives) have been replaced with /χ/ and /ʁ/ (voiceless and voiced uvular fricatives), since the sounds in MSA are uvular rather than velar.

**Notes:**

1. In interlinear examples, the hyphen is used in Arabic transcriptions to indicate bound morphemes.
2. In phonetic transcription in interlinear examples, there is a distance between the linking symbol (◌) and the following word to help align the glossing, but this should not affect the pronunciation.
3. An asterisk (\*) before a given form indicates that it is incorrect.
4. An exclamation mark (!) after a verb indicates that it is in the imperative mood.
5. The transcription of utterance-final words represents pausal pronunciation, except for verbs, in which the final vowel is indicated.
6. In the glossing, I have used the term ART (article) rather than DEF (definite), since many words in Arabic can be definite without having the definite article (e.g., by *'idāfah* 'annexation'). Arabic has no indefinite article; in the case of singular nouns, indefiniteness is normally expressed by *tanwīn* 'nunation' (final /n/ attached to the indefinite noun in non-pausal pronunciation).

**Appendix B**  
**Abbreviations Used in Glosses<sup>8</sup>**

1	first person
2	second person
3	third person
ACC	accusative
ART	article
ERG	ergative
F	feminine
GEN	genitive
INDF	indefinite
M	masculine
NOM	nominative
PL	plural
POSS	possessive
PRS	present
PST	past
PURP	purposive
SG	singular

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<sup>8</sup> Based on Leipzig Glossing Rules, available at: <http://www.eva.mpg.de/lingua/resources/glossing-rules.php>.



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