

The CV Phonological Treatment of Consonantal Geminata in Arabic

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“There are certain common types of consonantal sequences which have special names in the phonetic literature and some of which function as single units in particular languages. All of the special sequences... are *homorganic*, that is, they are articulated by the same organs. The first special sequence type... is known as *geminate* (from the Latin *geminare* ‘to double’, *geminus* ‘twin’)” Catford (1988:111)

1. Introduction

Like vowels, consonants can be looked upon as segments possibly subsumed under the process of lengthening that is usually given a phonological term, i.e. gemination. In Arabic, gemination may either occur word-medially or word-finally. The l- sound of the Arabic definite article ‘ʔal-’ in such a phrase as ʔal ʃamas ‘the sun’ is assimilated to the subsequent solar single consonant. Consequently, An assimilated form would be pronounced alternatively, i.e. ʔaʃʃamas, and in this case, the long consonant

/-ʃʃ-/is considered as a true geminate after eliding /ʔal-/. Word-final gemination does not fulfill a distinctive function in Arabic.

What is worth underlying here is that there are several general characteristics of consonantal gemination that researchers in phonological theory have been investigating for some years, beginning in pre-autosegmental frameworks and continuing recently within the CV phonological theory. In other words, scholars have attempted to account for these special properties and to see some of the ways as to how gemination behave phonologically.

The present study is an endeavour to cast light on how the CV model of phonology tackle certain aspects of consonantal gemination in Arabic. Moreover, it concentrates on essential points as to whether geminate consonants are treated as one long segment or as two short independent exponents that are found at syllable junctions.

2. CV Phonology: A Theory of CV Skeleton

Recently, phonological theory has witnessed a substantial change in the nature of its basic orientation. This change has been marked by the development of several new theoretical frameworks, which, according to some scholars and theorists, fall within the orbit of ‘nonlinear’ model of phonology. CV phonology, among these frameworks, comes into being as a result of refining and above all remodelling some of the ingredients, techniques and aspects for which the generative theory of phonology call.

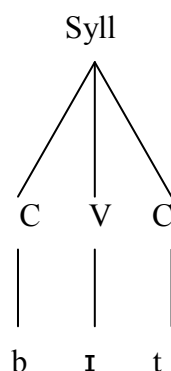
Since 1968, generative phonology has been dominated by the basic assumptions made in Chomsky and Halle’s *The Sound Pattern of English*

(*SPE*). A fundamental property of the *SPE* theory is the assumption that the deepest and the most interesting principles of universal grammar is found in the form and function of phonological rules. An example of this in *SPE* is the claim that disjunctive ordering relations between two adjacent rules are limited to cases where the structural description of the first rule properly contains that of the second (Anderson, 1985:92).

Against this conception of rule form and function, the CV model (like the other nonlinear ones) presents significant changes in dealing with phonological representations. Generally, CV phonology is viewed as “a model which adds a consonant (C) and vowel (V) tier to the syllabic and segment tier” (Crystal, 1997:101). Once added, the tier will remove the need for the feature [syllabic] at the skeletal tier, and consequently will give rise to the timing slots to be employed melodically. In their attempt to show the contribution of the CV approach, Clark and Yallop (1995:407) explicate that whenever the CV tier of C and V slots are postulated to be occupied by segments, the segments can be mapped straightforwardly on these CV positions. Thus, these segments in question are to be fully articulated on a phonetic ground.

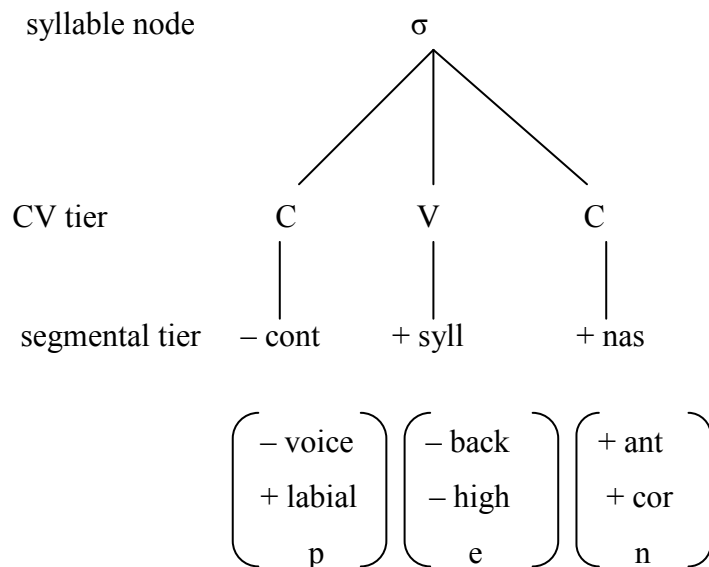
Practically speaking, the CV tier is seen as an advantageous pattern according to which its own units have the ability to define a certain functional position (i.e. peak vs. non-peak) within the syllable. For instance, such a word as *bit* /bIt/ can be said to consist of a single closed syllable with the vowel (marked as V) constituting the peak of that syllable, and two consonants (marked as C) occupying the marginal positions within the syllable (Clements and Keyser, 1983:10):

[1]

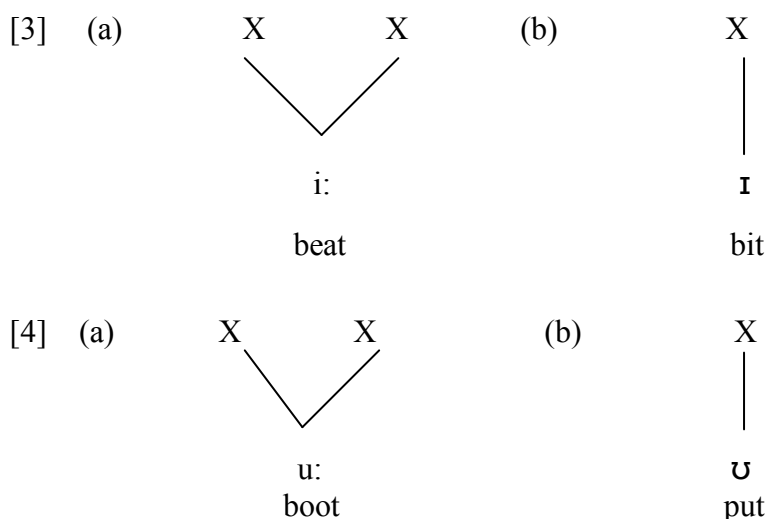


Katamba (1989:156) argues that the CV theory is required to perform three main tasks: (i) stating universal principles in order to govern syllable structure, (ii) stating syllable structure typology and (iii) stating language-specific rules to map syllable template. On this principle, the syllable is assumed to have three tiered structures that consist of the syllable node (σ), a CV tier and a segmental tier: (the word *pen* is taken as an example in this connection)

[2] syllable node



More importantly, the CV tier is sometimes referred to as the skeleton tier. The rationale behind such an alternative term resides in that it is suggestive of its composition of a string of Cs and Vs. Moreover, it constitutes the baseline of the edifice of sound in language (Roca and Johnson, 1999:687). That the timing tier made up of Xs implies that they are units of phonological and abstract timing, and that they are not intended to represent actual measurements. This can be apparently illustrated via applying the following formalism to the contrast between long and short vowels in such pairs as *beat* /bi:t/ vs. *bit* /bɪt/ or *boot* /bu:t/ vs. *put* /pʊt/:



The two Xs indicate that the first member of each pair is long, whereas both /ɪ/ and /ʊ/ are tense vowels.

It has been argued that the timing tier is seemingly designed to uncover segment length. A short segment is usually associated with one timing unit, while a long one with two. On the other hand, there are some

occasions in which a single timing unit can be associated with two values of a feature, viz. the case of affricates (Carr, 1993: 212). Given that affricates would be considered complex segments with more than one set of feature specifications.

3. *Gemination: Across Syllable Boundary*

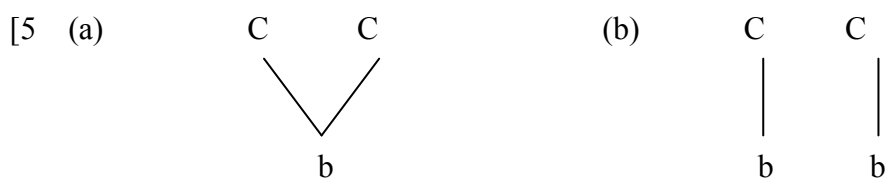
Gemination is seen as an important feature not only in Arabic but also in many languages and dialects. It is lexically defined as the doubling of an originally single consonant or the doubling of a letter in orthography. On the phonetic ground, gemination is accounted for in accordance with sequences of two identical articulations and prolongation of the articulatory posture (Catford, 1977; Gimson, 1989).

It has been noticed that the line of demarcation between ‘long’ consonants and geminate ones has been blurred for a long while. Two divergent approaches can be recognized in this connection. In one place, geminate consonants are different from long ones in that the articulation of the former necessitates double phases, i.e. the first phase constitutes a syllable final occurrence of the consonant, whereas the second phase, which is considered the re-articulated phase, commences the following syllable, and consequently constitutes a syllable-initial occurrence of the consonants (Lehiste et al, 1973:131). The other approach treats geminate and long consonants as the same and denies the existence of the two phases (Hall, 1964; Robins, 1964; Ladefoged, 2001).

Long and geminate consonants, many other scholars confirm, diverge greatly on the basis that the latter is marked by having articulation extending over two syllables. For this reason, the term ‘double consonants’

At the acoustic level, long consonants and double ones, Jones (1967:116) believes, are difficult to perceive. Notwithstanding, a distinction can be possibly drawn between sounds characterized with ‘true’ or ‘invisible’ length and others which are of ‘doubled’ or ‘repeated’ articulation. ‘True’ or ‘invisible’ length, strictly speaking, means a long duration that is not felt by the speaker as a repetition of a sound and above all cannot be replaced by doubling. He (ibid) considers “all intervocalic long consonants as double, on the grounds that it is usually possible in precise speech to separate them into two by a diminution of force in the middle, attaching the first part to the first syllable and the second part to the second syllable”. It is also found that when occurring intervocalically and not affected by derivation rules, long consonants are treated as double ones.

In the light of applying phonological rules to both single and geminate consonants and of adopting a nonlinear approach of phonology, another classification of consonantal gemination can be made: true geminates and apparent geminates (Goldsmith, 1990:80). True geminates are multiply associated consonants as in [5a], but apparent geminates are separately associated consonants acting as a consonant cluster as in [5b]:

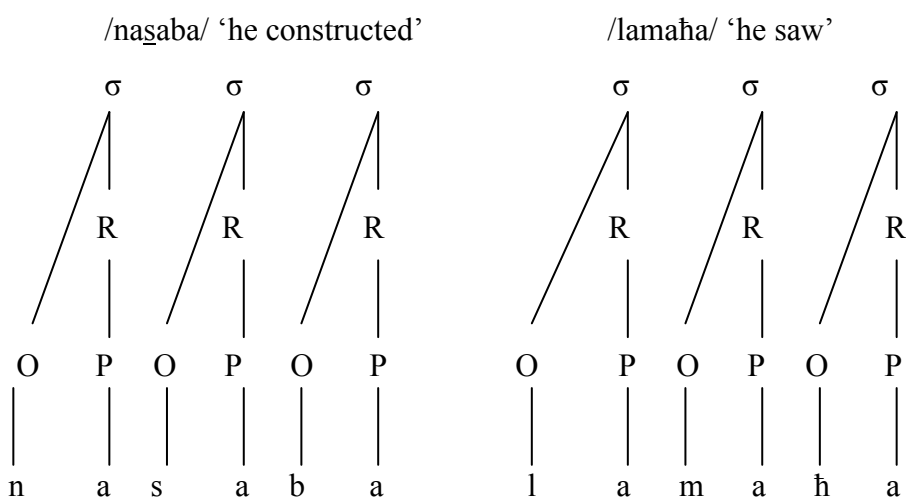


What is important here is that these two structures cannot be distinguished phonetically; the distinction is phonological on the assumption that all geminates that are internal to a single morpheme are true geminates (tautomorpheme geminates) and that all geminates formed across a morpheme boundary are only apparent geminates, at least underlyingly (ibid.).

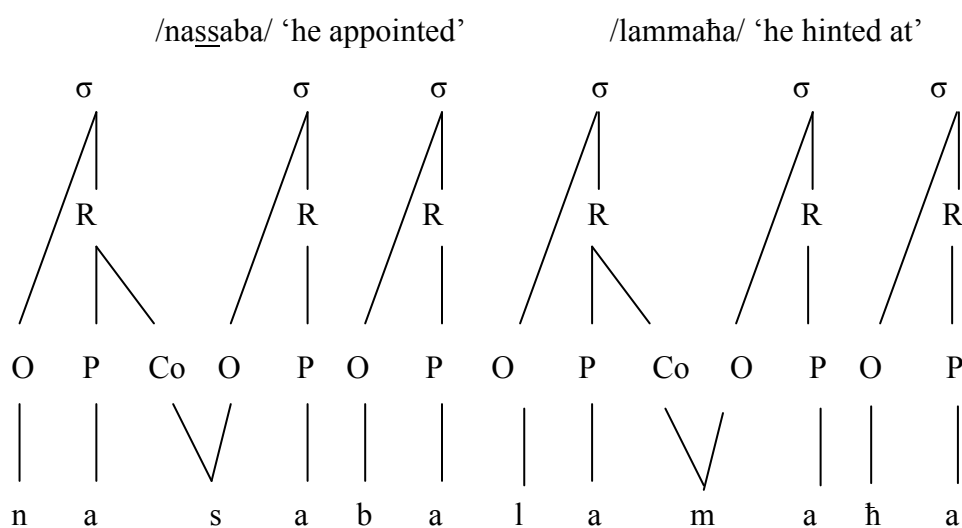
4. Geminate consonants in Arabic

When a consonant is geminated in Arabic, it is written once and a small sign called 'shadda' is required to place over the consonant. It was Arab philologists who were credited with the introduction of this sign that was merely an unlooped ʃ-sound derived from the word 'tashdeed' itself. The introduction of the new sign was of prime importance to avoid confusion with corresponding words having single consonants because the difference between single and geminate consonants has a distinctive function. Compare:

[6] Medial single consonants



[7] Medial geminate consonants



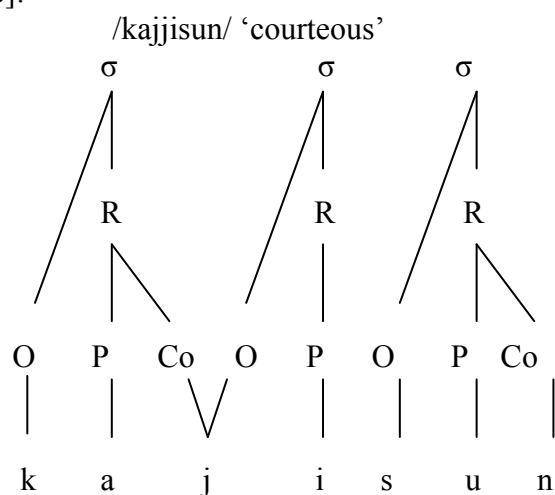
That geminate consonants in Arabic may either be treated as one long or two short segments is viewed as a key issue raised time to time. As far as Arabic grammar is concerned, the term geminate is applied to those consonants having a long duration and determined by certain phonetic contexts, or to consonant letters receiving the sign representing such a long duration (El-Saaran, 1951:162). The old Arab grammarians considered every geminate consonant as being equivalent to two sounds in pronunciation; the first being /saakin/ 'still' and the second /mutaharrik/ 'moving'. Hence, it is convenient to interpret a geminate consonant in Arabic as being double and not long. This, in turn, paves the way to state that on the ground of syllabification, any intervocalic geminate consonant

should be split into two components: one is related to the first syllable and the other to the second syllable (ibid.).

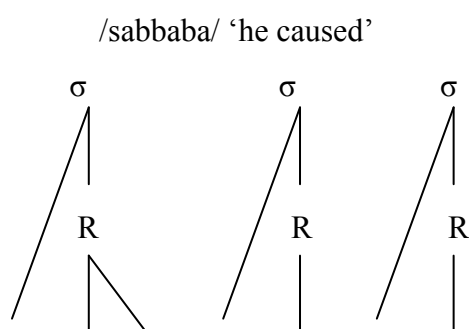
In spite of accepting the definition of a geminate consonant as expressed by the old Arab grammarians and in terms of its syllabic structure, i.e. having a CCV pattern, in which the first C-element is a 'still' sound and the second C-element is a 'moving' sound, a geminate in word-initial position becomes an out of question pattern in Arabic. A geminate in Arabic can then only occur either word-medially or word-finally. The V-element of the geminate can be any of three short vowels /i/. /a/ or /u/ as in

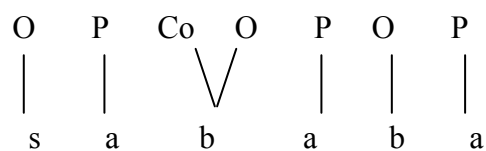
[8a], [8b] and [8c]:

[8a]



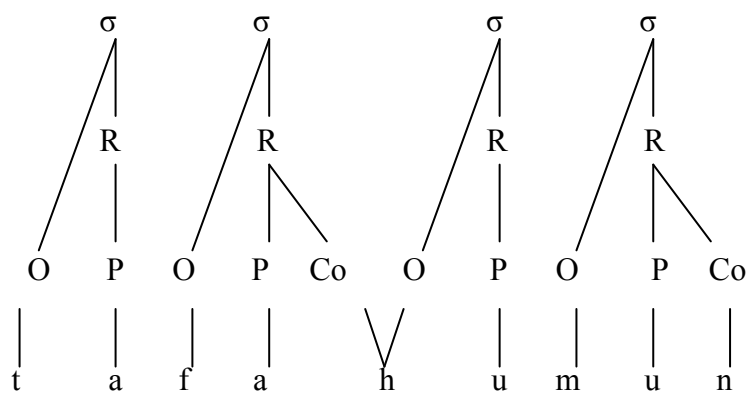
[8b]





[8c]

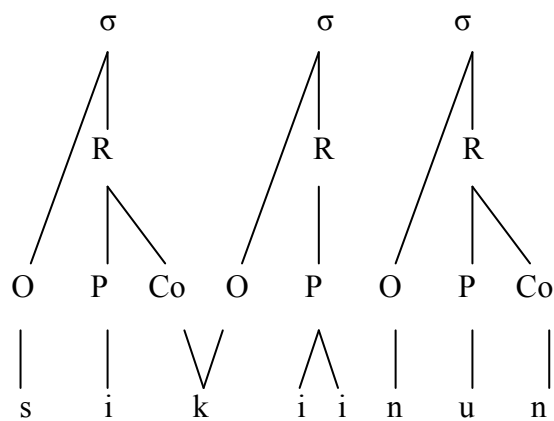
/tafahhumun/ 'understanding'



It can also be any of the long vowels /ii/, /aa/ or /uu/ as in [9a], [9b] and [9c]:

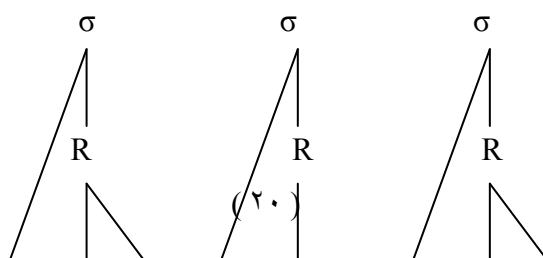
[9a]

/sikkiinun/ 'a knife'



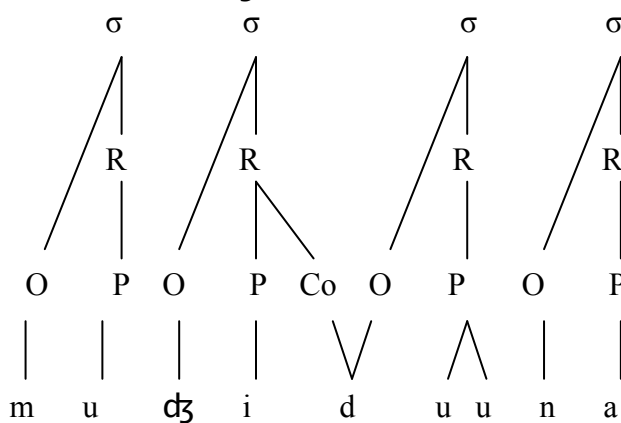
[9b]

/tullaabun/ 'students'



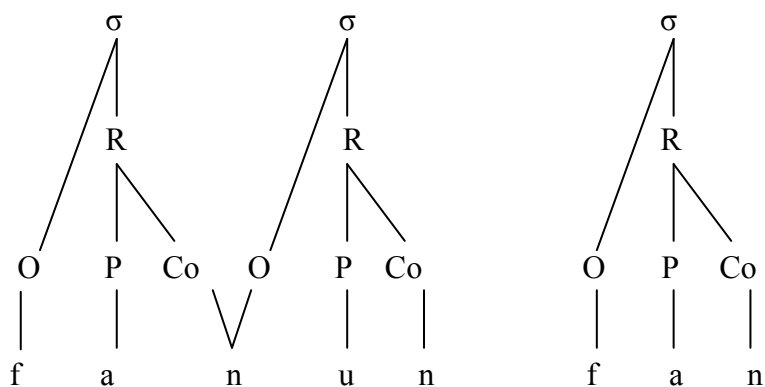
O P Co O P O P Co
| | |
t u l a a b u n

/mudʒidduuna/ 'hardworkers'



[10]

b. /fann/ 'art'



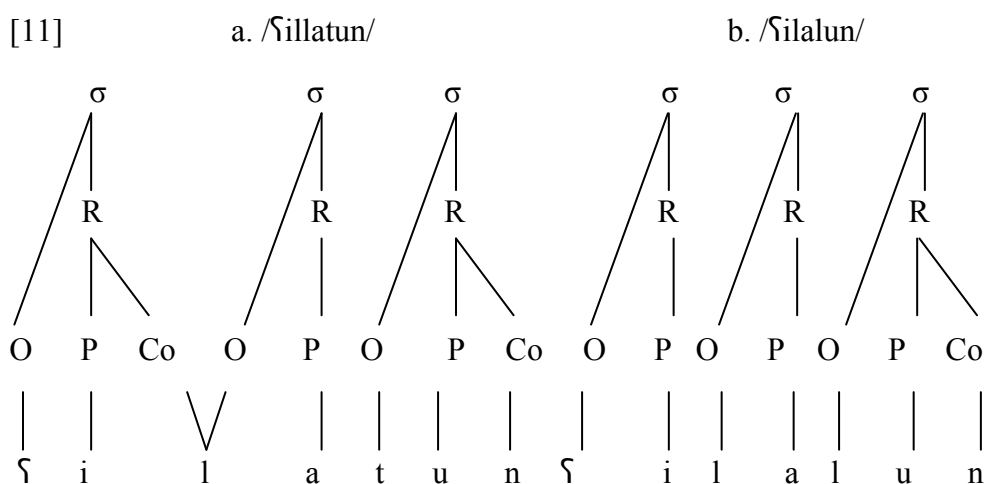
Nevertheless, geminate consonants occurring word-finally do not fulfill a distinctive function in Arabic since contrast between single and geminate consonants in this position are out of interest. Articulating a final consonant entails a conscious effort to make it perceptible, as was recognized by Arab grammarians. Here, Cowell (1964:23) purports that:

in word-final position, any geminate consonants may occur after an accented vowel. At the end of a phrase, however, geminate consonants do not actually contrast with single ones; pronouncing, or even writing, them simply serves to show the position of the accent and their potential significant length before vowels.

In a similar vein, it has been contended that a final geminate in Arabic is characterized by tenseness of articulation as compared with a non-geminate partner (Jonestone, 1967; Ghalib, 1984).

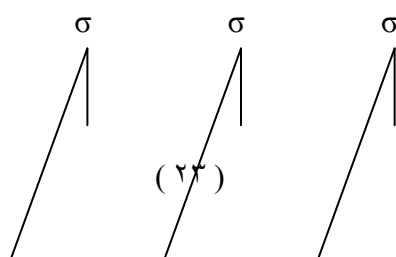
Importantly, the way a geminate behaves in a derivative situation is one of outstanding features of consonantal gemination in Arabic. Arabic derivations have a vowel inserted between the components of a geminate consonant. This context can be obviously indicated when forming plurals, and while in the singular form the geminate is retained, in the plural form it is separated by inserting a vowel, often /a/, between its components. A

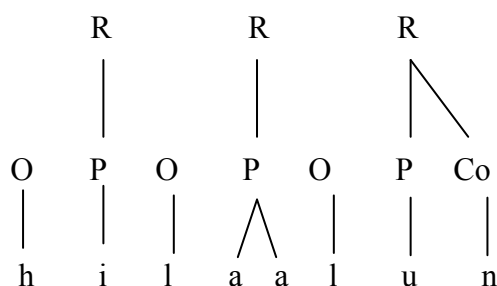
singular word such as /ʕillatun/ 'cause' is compared with a plural cognate, i.e. /ʕilalun/ 'causes':



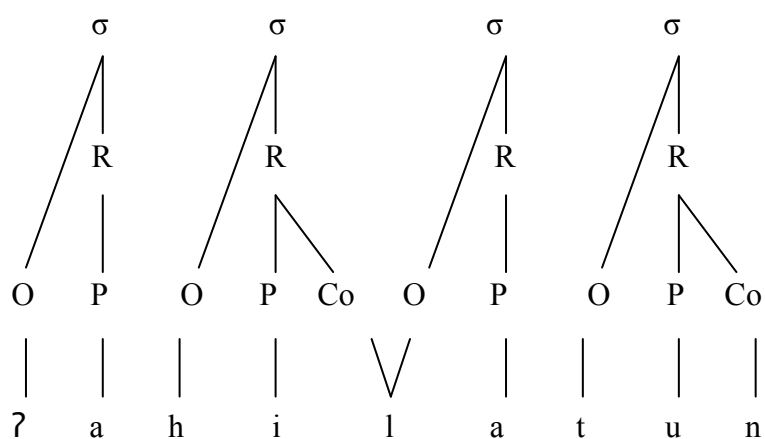
In other contexts, such a situation may take place in reverse. That is to say, the plural form takes the geminate consonant and the singular one retains its single counterpart. Moreover, other changes in the preceding and / or following vowels and the location of stress can be recognized between the word in its singular form and that in its plural form, as is shown in the following diagrams:

[12a] /hilaalun/ 'crescent'





[12b] /ʔahillatun/ 'crescents'



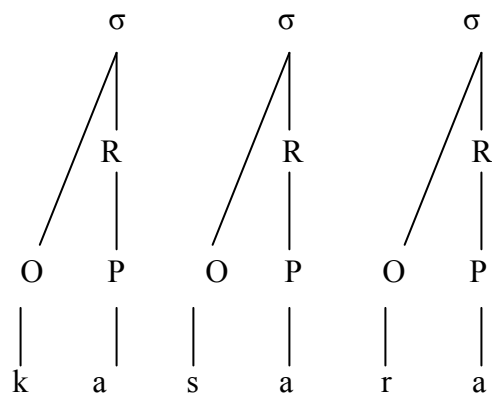
However, in some occasions the geminate consonant may be available in the singular form as well as in the plural one.

5. *Gemination as a Result of the Internal Word Structure*

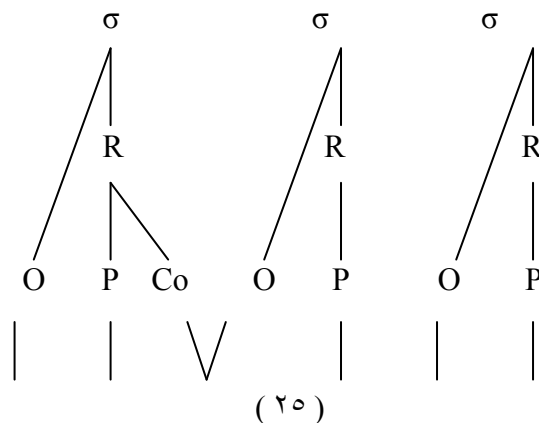
Under certain phonetic circumstances, gemination seems to be a basic part of the internal structure of the word. It is a key factor in deciding on the syllable pattern of words.

In Arabic, that words of medial geminate consonants are divergent from those of corresponding single consonants are of prime significance. Above all, there are pairs of words that are distinguished on the basis that one contains word-medial geminate consonant and the other contains its single counterpart. But this does not necessarily mean that every word in Arabic with a geminate consonant has a corresponding word with a single consonant. Trisyllabic verbs having the patterns of (faʕala) for single and (faʕʕala) for geminate can be cited as examples in this connection:

[13a] /kasara/ 'he broke'



[13b] /kassara/ 'he smashed'

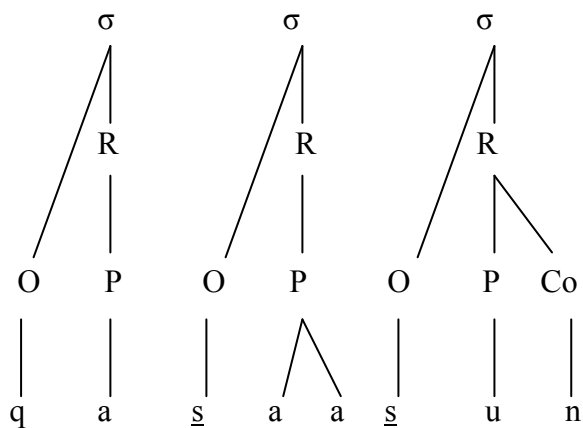


k a s a r a

Contrast between single and geminate consonants can also be found in nouns and adjectives, particularly those of the patterns (faʕaal) and (faʕʕaal):

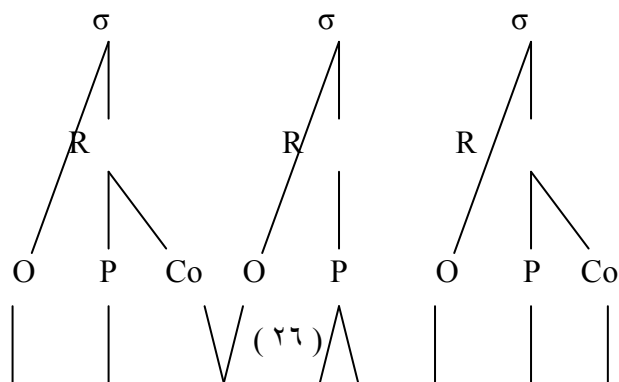
[14a]

/qas̱aasun/ 'punishment'



[14b]

/qass̱aasun/ 'novelist'



q a s a a s u n

Nevertheless, there are words in Arabic that contain medial geminates for which no corresponding words with medial single consonants are available. Meanwhile, words of medial single consonants for which there are no corresponding words of medial geminates are too many to be enumerated in Arabic.

6. Conclusion

It becomes apparent that a study as such unveils some sort of findings hopefully utilized to build up a picture of how consonantal gemination in Arabic is tackled from a CV angle. In one place, a distinction is made between single and geminate consonants, particularly when they occur word-medially. Intervocalic geminates are viewed as double and not long segments whereby they are separated into two parts: one belongs to the first syllable and the other to the second syllable. On the other hand, word-final geminates are considered long indivisible entities on the ground that they occur within one and the same syllable structure.

Phonetic Symbols (After El-Saaran(1951))

1. The Vowels:

/i/ as in /kitaabi/ 'my book'

/ii/ as in /diin/ 'religion'

/a/ as in /ðahaba/ 'he went'

/aa/ as in /kaatib/ 'a writer'

/u/ as in /darasu/ 'they studied'

/uu/ as in /suur/ 'wall'

2. The Consonants:

/b/ as in /baab/ 'door'

/dʒ/ as in /dʒaar/ 'a

neighbour'

/t/ as in /taʕliim/ 'education'

/m/ as in /maʕtar/ 'rain'

/t̪/ as in /t̪awiil/ 'long'

/n/ as in /namir/ 'tiger'

/d/ as in /tadriib/ 'training'

/r/ as in /ramaad/ 'ash'

/d̪/ as in /d̪aalim/ 'unjust'

/l/ as in /laʕiim/ 'mean'

/k/ as in /kiðba/ 'lie'

/w/ as in /waʕsal/ 'he arrived'

/ʔ/ as in /ʔamal/ 'hope'

/j/ as in /jamiin/ 'oath'

/f/ as in /faaʕiz/ 'a winner'

/s/ as in /sakata/ 'he stopped talking'

/s̪/ as in /s̪adma/ 'shocked'

/z/ as in /zaahi/ 'shining'

/ħ/ as in /ħaliim/ 'patient'

/ʕ/ as in /ʕammara/ 'he constructed'

/h/ as in /haaʕil/ 'formidable'

References

Abercrombie, D. (1967) *Elements of General Phonetics*. Edinburgh:EUP.

Anderson, S. R. (1985) *Phonology in the Twentieth Century*. Chicago:

University of Chicago Press.

Carr, P. (1993) *Phonology*. London: Macmillan.

Catford, J. C. (1977) *Fundamental Problems in Phonetics*. Edinburgh: EUP.

Catford, J. C. (1988) *A Practical Course in Phonetics*. Oxford: OUP.

Chomsky, N and Halle, M. (1968) *The Sound Pattern of English*. New York: Harper & Row.

Clark, J. and Yallop, C. (1995) *An Introduction to Phonetics and Phonology*. Oxford: Blackwell.

Clements, G. and Keyser, S. (1983) *CV Phonology: A Generative Theory of the Syllable*. MIT Press: Cambridge, Mass.

Cowell, M. (1964) *A Reference Grammar of Syrian Arabic*. Washington D. C.: Georgetown University Press.

El-Saaran, M. (1951) *A Critical Study of the Phonetic Observation of the Arab Grammarians*. Unpublished Ph.D. Thesis, University of London.

Ghalib, G. B. M. (1984) *An Experimental Study of Consonant Gemination in Iraqi Colloquial Arabic*. Unpublished Ph.D. Thesis, University of Leeds.

Gimson, A. C. (1989) *An Introduction to the Pronunciation of English*. London: Edward Arnold.

Goldsmith, J. (1990) *Autosegmental and Metrical Phonology*. Oxford: Blackwell Hall, R. A. (1964) *Introductory Linguistics*. New York: Chilton Books.

Johnstone, T. M. (1967) *Eastern Arabian Dialect Studies*. Oxford: OUP.

Jones, D. (1967) *The Phoneme: Its Nature and Use*. Cambridge: Heffer & sons.

- Katamba, F. (1989) *An Introduction to Phonology*. London: Longman.
- Ladefoged, P. (2001) *A Course in Phonetics* (4th Ed). New York: Harcourt
Brace.
- Lehiste, I., Morton, K. and Tatham, N. (1973) "An Instrumental Study of
Consonant Gemination", *J. Phon.*, Vol. 1, pp.131-148.
- Robins, R. (1964) *General Linguistics: An Introductory Survey*. London:
Longman
- Roca, I. and Johnson, W. (1999) *A Course in Phonology*. Oxford:
Blackwell.