SYLLABLE STRUCTURE AND SYLLABIFICATION IN AL'AIN LIBYAN ARABIC

A thesis submitted

by

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Declaration

I declare that this thesis has not been previously submitted for a degree at Newcastle University or any other university and it is entirely my own work.

Signed: Date:

21/04/2016

Tamader H A Hwaidi

Abstract

The variety of Arabic under investigation is one of the dialects spoken in a town on the Western Mountain (Nafuusa Mountain) in Libya. Its phonological characteristics are clearly different from what Harrama (1993) called the "Al-Jabal dialect," which the inhabitants of the Western Mountain claim to speak. The current study is concerned with a variety spoken in the town of Riyayna (Or Alriyayna); mainly, Al'ain (henceforth identified as ALA).

The objective of this thesis is to contribute a description of the phonology of a previously unexamined dialect, under a moraic approach. This approach has been adopted as the prominent role of the mora that has been established in literature by accounting for various phonological phenomena, such as vowel epenthesis (Itô, 1989) and compensatory lengthening (Hayes, 1989) (see Watson 2002). Thus, it is claimed for example, that the loss of the glottal stop in ALA is repaired by compensatory lengthening in words, such as: /biːr/ ~ /bɪʔr/, /raːs/ ~ /rʌʔs/, /juːmɪn/ ~ /joʔmɪn/ to satisfy the minimal moraicity requirement, or by gemination: /mɪjjah ~ mɪʔah/, /rɪjjah/ ~ /rɪʔah/ to satisfy the restriction of vowel-initial syllables, utterance-internally.

Although, the main aim of the thesis is to examine the syllable inventories and syllabification process in ALA, focus is placed on initial consonant clusters that are claimed to exist in a cluster-resistant dialect, where it is argued that such clusters strictly occur in certain environments.

Emphatics and emphatic allophones are also phonologically investigated claiming that, in addition to the four emphatic consonants, emphatic vowels (/ʌ/ and /ɑː/ in ALA) also exist in the dialect and similarly cause emphasis spread.

Vowel-initial syllables is another issue whose existence in ALA is asserted in this study demonstrating that although they might surface with a glottal-stop-like gesture, they should still be treated as underlying onsetless syllables because their behaviour is different from syllables that underlyingly begin with a glottal stop.

Finally, stress assignment procedures in ALA are interesting in following many North African dialects by ignoring, in many cases, syllable weight and having a tendency to stress final syllables. This is also expressed in the study.

Dedication

To the soil combined with Baba's sweat,

Where Mama's olive tree grew taller,

To the tickle I still remember on my bare tiny feet,

May the land be in peace …

For my children

إلى تراب امتزج بعَرَقِ أبي ،

ونبتتْ فيهِ شجرةُ زيتونِ أمّي ،

ودغدغَ باطنَ قدميِّ الصغيرتين ،

فليحِلَّ فيكَ السلام ...

منْ أجلِ أطفالي

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I cannot find words to express my gratitude to Al-Khansaa Martakush for her care, friendship and kindness during the tough times I faced during the final stage of writing my thesis.

Contents

List of the phonetic symbols[1]

Notes:

- Standard IPA is used throughout the thesis.
- The letter in bold is the reference.
- Non-underlying emphatics are not indicated here, as their case is discussed widely in Chapter Two, where their existence is a result of emphasis spread[2]. These include both the allophonic consonants for all the non-emphatic consonants in this dialect and the allophonic emphatic counterparts for the vowels which exist as a result of emphatic spread, and thus are different from the their underlying emphatic.
- The masculine second person singular meaning (whether it or he) is implied in all the verbs demonstrated.

Phonetic symbol	Example	Gloss
b	**b**æn	appeared
t	**t**æb	repented
d	**d**ɑːˤr	room
k	**k**æn	was
g	gæl	said
ʔ	sɪ.**ʔ**al	asked
tˤ	**tˤ**ɑːˤr	flew
f	**f**ɑːˤr	mouse
ðˤ	**ðˤ**ɑːf	added
sˤ	**sˤ**ɑːr	happened
zˤ	**zˤ**oros	molar
θ	**θ**ær	revolutionised
ð	**ð**æb	melted
s	**s**æd	enough
z	**z**æd	added
ʃ	**ʃ**æf	saw
ʒ	**ʒ**æk	came to you

[1] The lists only include the symbols that are used throughout the thesis; those which are used by other authors and are occasionally illustrated in the thesis will be explained relevantly.

[2] The term is a translation of the Arabic technical term ‘tafxim’. Different terms have been used by linguists to refer to this phenomenon. Such terms are ‘velarization’, ‘backing’, ‘pharyngealisation’, and recently ‘dorsalization’. (Youssef, 2006: 12)

x	**x**ɑːn	betrayed
ɣ	**ɣ**ɑːb	has been absent
ħ	**ħ**æl	situation
ʕ	**ʕ**ɑːr	shame
h	**h**æn	is trivialized
m	**m**æt	died
n	**n**ɑːr	fire
l	**l**æm	blamed
r	**r**ɑːs	head
j	**j**æs	despair, N.
w	**w**ɪlɪd	boy
a	mal	be bored with
ɪ	s**ɪ**r	secret
iː	s**i**ːd	master, N.
eː	z**e**ːt	oil
æ	næs	people
ʌ	ħ**ʌ**tˤ	put
ɑː	ħ**ɑ**ːr	hot
o	ħo̲tˤ	put, Imp.
oː	ħ**o**ːʃ	house
ʊ	sˤ**ʊ**r	pack, Imp.
uː	ɣ**u**ːl	goblin

List of abbreviations

ALA	Al’Ain Libyan Arabic
MSA	Modern Standard Arabic
JDLA	Al-Jabal dialect
TLA	Tripolitanian
MLA	Misrata Libyan Arabic
CMA	Casablanca Moroccan Arabic
S/F	Stop/Fricative
S/S	Stop/Stop
F/F	Fricative/Fricative
UG	Underlying glottal stop
EG	Epenthetic glottal stop
HQ	hamzatul-qatʕi
HW	hamzatul-wasˤli

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Chapter 1: Introduction

1.1.Al’ain Libyan Arabic (ALA)

The current study is an attempt to identify the syllable template and the syllabification process in ALA using the moraic approach. Al’ain Libyan Arabic is a dialect that is spoken by inhabitants of a tribe named after a water spring that exists in the area in a town called Riyayna on the West Mountain in Libya; that is Al’ain, literally meaning “the eye”. The old inhabitants were tribes that travelled the Libyan dessert searching for any means of water. They finally settled half way up the West Mountains (Nafousa Mountains). Later on, all the tribes moved to the top of the mountain as it was easier to live on a plain closer to their farms, where people spent most of their time. The gathering of Al’ain with the neighbouring tribes that migrated to the top of the mountain later formed what is known today as Riyayna and which is comprised of districts speaking the same Libyan dialect, although with some differences amongst the various tribes. The following pictures illustrate the dialect area within the North West and within Libya using online live maps:

Figure 1: The dialect area within the North West of Libya

Figure 2: The dialect area within Libya

As this Arabic dialect has not been studied before, the phonological structure of its syllable and the syllabification process are thoroughly investigated throughout the thesis.

1.2. Data sources

The main source for ALA data is the author; being a native speaker of the dialect and living in the area for most of her life. Furthermore, consultation from the author's father and friend and a friend's mother was also sought when any second opinion was required. In addition, after advice from the examiners of this thesis, the data was rechecked with twelve people from the town, who were a mix of males and females, educated and non-educated and from the 25-60 age group.

It is also worth stating that as a speaker and being in direct communication with TL, the examples used for this dialect with no reference to another authors in the thesis, although limited, are my own.

Being half Egyptian, some Egyptian examples that are also not assigned to any other author, are exclusively my own examples employed after consultation with relatives in Egypt.

1.3. Aims of the study

The main aim of the current study is to authenticate the dialect as it has never been documented before. The analysis of the dialect has adopted the moraic approach which has proved useful in accounting for such syllabification phenomena as syllables distribution, syllabification directionality and vowel lengthening, syncope and epenthesis.

1.4. Organisation of the thesis

Chapter One briefly introduces information about the dialect, the region and its surroundings within the North West of Libya, the source of the data. The aim of the study is discussed in Section 1.3. Sections discussing syllable theory in phonology are briefly discussed in this chapter in support of using moraic theory for the documentation of the dialect. Therefore, the role of the syllable in a phonological theory is presented, followed by a discussion of the moraic approach as well as previous approaches, in order to provide a background and to argue for why moraic theory is favoured over the others in the current study. A brief overview of Arabic morphology is also provided in this chapter.

Chapter Two is a comprehensive discussion of the phoneme system of Al'ain Libyan Arabic, where the phonemic and the phonetic inventories of the dialect are presented, shedding light on important phenomena such as glottal loss and gemination. In this chapter, the phonemes and allophones of the dialect are discussed and identified using the minimal pair test for both consonants and vowels of ALA. These are supported by a large number of examples. As the main allophonic context in ALA comes from emphasis spread, this is thoroughly discussed to identify the different allophones. The only other significant allophones that are briefly discussed are the velar [ŋ] which is an allophone of [n], the labiodental [ɱ] which is an allophone of [n] and the vowel [e] which is an allophone of /ɪ/. Emphatic vowels are also shown to occur in the dialect.

Underlying and non-underlying geminates are also tackled in Chapter Two. Moreover, the issue of glottal stop is discussed here to support the claim that is made later in Chapter Three that ALA exhibits vowel-initial syllables although their occurrence is limited.

Chapter Three starts with an introductory section presenting an overview of the traditional research of the Arabic philology. This is followed by a presentation of the syllable types that are claimed by other researchers to occur in different Libyan dialects such as TLA (Tripoli Libyan Arabic; Al-Ageli, 1995) and JDLA (Al-Jabal dialect; Harrama, 1993), amongst others.

After the general discussion of the syllable algorithm in LA, the ALA syllable algorithm is illustrated in the following sections by discussing the maximal syllable template, syllable types and distributions. Also, issues such as sonority in ALA, consonant clusters, and heterosyllabic consonants in ALA are also discussed.

In this chapter, there is an argument for the existence of word-initial vowel-initial syllables clarifying the questions surrounding the issue and the reasons why researchers should not necessarily believe in the obligatory onset principle word-initially for all varieties of Arabic.

Chapter Four addresses the syllabification process in ALA. Thus, the chapter includes discussions of extrametricality and extrasyllabicity, syllabification of intervocalic consonants, geminates and internal closed syllables. Syllable weight and its contribution in syllabification in ALA is discussed. In doing so, heavy and light CVC and whether this contributes to the syllabification and stress assignment is looked at under 4.1.1. Superheavy CVVC syllables are discussed as well.

To understand and identify the syllabification process in ALA, the stress assignment parameters of the dialect are also illustrated with a discussion of the extent of the role of syllable weight in stress assignment.

Furthermore, the chapter also presents four synchronic phonological repair processes that are motivated by the syllabification process. This includes discussion of vowel epenthesis, syncope and lengthening.

Chapter Five is a conclusion and includes recommendations for further research, with re-emphasising the issues of vowel-initial syllables and emphatic vowels as being controversial and meriting further investigation.

1.5. Development of syllable theory

In this section, the role of the syllable is reviewed with reference to the phonotactic constraints operative in the dialect. Following that is a review of the moraic theory with an overview of the pre-moraic approach era to demonstrate the significance of it to Arabic syllable structure and syllabification.

1.5.1. The role of the syllable in phonology

From the early stages of the development of phonological theory, the requirement for syllable recognition has been reflected in various notions. Even in SPE, the recognition of words consisting of CV sequences and the use of the [syllable] feature to differentiate Cs from Vs was unofficially pointing to the need for the syllable notion. Thus, the formal recognition of the syllable as a phonological unit and its role in phonological analysis was reflected in the work of several researchers, including Vennemann (1972), Hooper (1976), Khan (1976), McCarthy (1979a), Selkirk (1982), Clements and Keyser (1983), Blevins (1996) among others.

Beyond the fact that the notion of "syllable" has generally been recognised within the literature, its role in phonological representation has been controversial. Kenstowicz (1994:250) mentions that as the 'syllable' notion is abstract, its recognition as a prosodic unit does not have a phonetic correlation. Thus, the evidence for the need of the syllable in a phonological analysis can be seen from different perspectives, which are surveyed below.

1.5.2. Phonotactic constraints

The way in which the distribution of sounds is recognised seems to be constrained and accounted for by using the syllable structure. Languages differ in defining such constraints and applying them, which produces a greater understanding of why native speakers are spontaneously able to break up a consonant sequence, which is restricted in their own languages. For example, an English speaker knows that *tr* is a possible cluster word-initially while *tl* is not. Moreover, they can also recognise that the *tl* cluster never occurs as an onset even in word-medial positions. Such an example is *a.ttract* and *at.las*. This idea provides evidence of the need for syllable in phonological theory. The role of phonotactics in syllabification will soon be discussed in the coming sections.

1.5.3. Allophonic evidence

Having different allophones associated with different syllabic positions also provides strong evidence of the importance of the syllable in phonology. Kenstowicz (1994: 251) provides an example of the phoneme /t/ being pronounced differently in both *Atlantic* and *atrocious* (with glottalised [t̂] in the first and aspirated [t^h] in the second. Such phenomena cannot be accounted for without reference to syllables. If the words have to be cut down into syllables, taking into consideration the phonotactic constraint that *tl* is not possible syllable-initially, while *tr* is, then *Atlantic* and *atrocious* are syllabified as *At.lan.tic* and *a.tro.cious* respectively. This procedure enables the occurrence of a phonetic rule of glottalising a syllable-final *t* and a phonetic rule of aspirating a syllable-initial 't'.

1.5.4. Phonological processes

Many phonological rules such as epenthesis, vowel reduction, vowel loss, vowel lengthening and assimilation can only be accounted for when referring directly to the syllable. Vowel epenthesis, for example, which happens in many languages in the world, is another piece of evidence for the occurrence of the syllabification (and resyllabification) processes. It occurs in a language when the existence of a string of consonants is illicit in that language. For example**,** in order to surface in many Libyan Arabic dialects, consonant clusters do not usually occur syllable-finally. Therefore, in the underlying form /ʒɪb-t/ 'I brought', a vowel is inserted to break the final *bt* cluster and create a new syllable: /ʒɪbɪt/ where /b/ constitutes the onset of the first syllable and /t/ constitutes the coda of the new syllable. Spencer (1996) provides an example from Koryak[3], where the maximal syllable permitted is CVC. [təpŋəlon] 'I asked him' is a surface form that has undergone two stages of epenthesis; in the first a schwa is added so as to break the banned syllable-initial cluster /tp/ and create a new syllable [təp]. In the second stage, the sequence /ŋl/ in [təpŋl] is not permissible and insertion of a schwa would result in /ŋ/ being syllabified as an onset of the syllable /ŋə/.

Some languages in avoiding illicit clusters prefer to delete rather than epenthesize, whereas, in other cases, both deletion and epenthesis are used in the same language. The process of segment deletion is called 'Stray Erasure' in a generative analysis, where unsyllabified segments are deleted (for example, the English unsyllabified sequence */mn/ in coda position, e.g., *hymn* suggests deletion of the /n/) and also as "... the process involved in closed syllable shortening in many languages." For example, CVVC may surface as CVC through the deletion of one of the vowels or the shortening of a long vowel. (Blevins, 1995: 223)

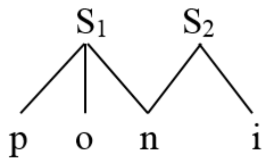
1.5.5. Early Syllable Theories

The need for an improved understanding of the syllable was recognised very early in the literature. Apart from the native speaker's intuition regarding the breaking down of words into smaller units, an informal recognition among phonologists appeared in their attempts to resolve several phonological problems. In their linear representation using the feature [±syllabic], Chomsky and Halle in the Sound Pattern of English (SPE, 1968: 241) needed, for example, to differentiate between the properties of weak and strong clusters in order to account for phonological rules such as "Stress Rule", "Tensing Rules" and "Auxiliary Reduction Rule". The requisites to the presence of a hierarchical approach have been recognised since the mid-seventies, where stress and tonal analyses were needed. Kahn (1976) presents two layers of representation where segments were associated on a higher level to constitute syllables. In his hierarchical representation, he makes use of the same feature used previously in the SPE, that is [syllabic], to differentiate between vowels and consonants, where vowels are [+syllabic] and consonants are [-syllabic]. By counting the [+syllabic]

[3]This is a language spoken in Russia.

segments, we count how many syllables there are in a string of segments. Thus, Khan's representation is as illustrated below:

(1.1) Khan's hierarchical representation of the syllable[4] (1976:36)



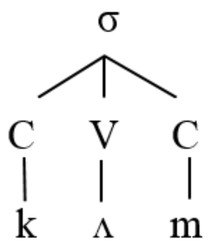
In his theory Khan states that while vowels can only be attached to one syllable, consonants can occupy at least one position, and hence can be attached to more than one syllable. Thus, /n/ in the representation above is attached to the two syllables. This implies three syllabifications: /pon.i/, /po.ni/ and a third is one in which /n/ is ambisyllabic. Syllabification rules are the thing that determines which syllabification works in a language. Furthermore, this issue of syllabification will be discussed shortly.

1.5.5.1. CV and X-bar theories

Clements and Keyser (1983: 187-188) criticised Kahn's use of the feature [syllabic] as it did not make a distinction between syllable peaks and margins, and accordingly, his model ignores the relationship between adjacent segments. Thus, for example, in the American English word *earl*, /r/ and /l/ are dominated with the same node which does not specify the /r/ to be the syllable peak. In an attempt to solve this problem, extending Kahn's framework, they introduced a third tier having the nodes C for consonants and V for vowels (represented in a separate level called the CV-tier) to distinguish between syllable peaks and syllable margins. Thus, the word *come* would be represented as follows:

[4] 'S' stands for syllable.

(1.2) CV-tier approach

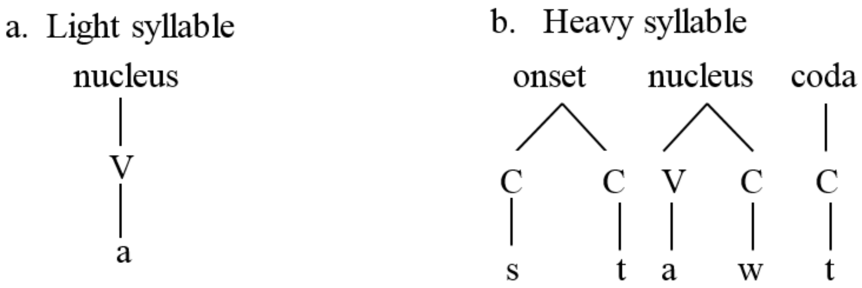


Clements and Keyser's CV approach was built on the fact that previous prosodic approaches failed to characterise the distinction between "heavy" and "light" syllables. They were the first to employ this CV-tier to determine the phonological functions within syllables. They claimed that although their CV representation is similar to McCarthy's (1979a, 1981 and 1983) morphological theory, it differs in that it does not only serve to define functional positions within the syllable as this can be recognised from the hierarchical representation; that is to say, it is not only "a constituent of morphological analysis" that McCarthy used in his theory to account for the "prosodic templates" which serve as independent morphemes in Arabic. Instead, this tier functions as a real determiner of the real status of segments; therefore, it is useful in recognising the difference between, for example, single segments and geminates or bimoraic constituents where single segments are assigned to single Cs and Vs on the CV-tier, whilst geminates and bimoraic segments connect to two slots on this tier.

A third tier dominating the CV-tier was adopted from Halle and Vergnaud (1980) and Selkirk (1981) and was used by Clements and Keyser to differentiate between heavy and light syllables. This level consists of the constituents: onset, nucleus and coda where the nucleus is observed to define the syllable weight; the nucleus of a light syllable ends with a short vowel, while a heavy syllable either has its nucleus to contain a long vowel[5] or diphthong, or has a short vowel in the nucleus and a consonant in the coda. The representation below shows this medial tier and the representation of heavy and light syllables.

[5] As explained before, long vowels are indicated with double vowels in the Roman and with the IPA symbols for the different long vowels in the phonetic transcription. This is used throughout the thesis unless stated.

(1.3) The determination of syllable weight in CV phonology

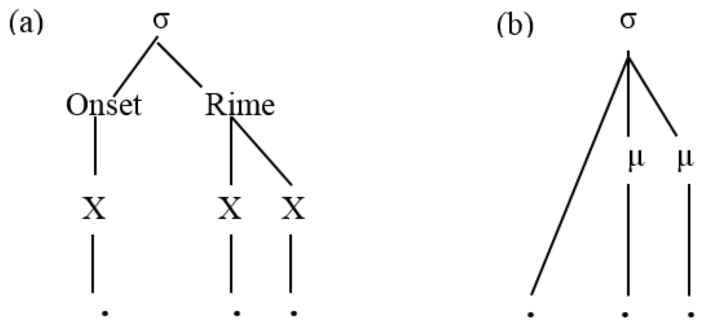


1.5.5.2. The Mora Approach

As illustrated above, syllable weight in CV theory is represented by the nucleus/coda tier. Referring to this and to the idea of sharing consonants over syllable boundaries; “extraprosodic consonants” (McCarthy and Prince, 1996), syllable weight is represented by “moras” in a separate node labelled as μ in a moraic approach. In this approach, the mora is used instead of the rhyme in an onset/rhyme notation to determine the weight of the syllable (Hyman, 1985 and McCarthy and Prince 1988 and 1996). The mora “is a unit of phonological weight that measures syllable heaviness and lightness; taking into consideration extraprosody” (Bernouss, 2007: 155)

Harris (2007: 132-134) makes a comparison between the x-slot model first presented by Levin (1985) and the moraic model proposed by Hyman (1985) and McCarthy and Prince (1996). Both models are based on the representation of syllable weight using a separate skeletal tier where weight relations are independently represented, as they remain stable regardless of any phonological changes and differences. Such a difference is the equal attraction of syllables ending with VV and syllables ending with VC to the stress. ‘Compensatory Lengthening’ is also evidence where a vacant position is occupied by the spreading of a segment when a neighbouring segment is lost for any reason. Interpretation of the syllable weight differs in the two different approaches. This difference is simplified by Harris and illustrated below:

(1.4) X-slot model versus moraic model 'μ' respectively (Harris, 2007: 132)

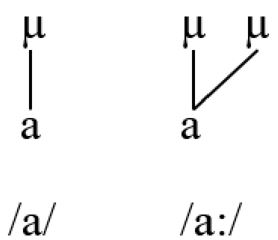


As the figures above confirm, in the moraic model a heavy syllable is one which is bimoraic, while in the x-slot model a heavy syllable is one that has a branching rhyme.

McCarthy and Prince (1990 and 1996) applied the idea of extraprosodic consonants to account for how an onsetless syllable gains an onset by sharing the consonant of a preceding syllable, and how open syllables may have a coda by sharing the consonant of a following syllable.

A mora node is associated with the weight barrier slot; which is usually the nucleus, given that single consonants do not usually contribute to the weight of the syllable. Hence, in a moraic model, short vowels are assigned to only one mora, while long vowels are assigned to two moras, as illustrated below:

(1.5) Mora association to vowels (Watson, 2002: 53)



1.6. Moraicity and Arabic syllable structure

As mentioned above, the vast majority of researchers (including traditional Arabic grammarians and modern researchers) agree on the basic syllable types in MSA although the researchers differ in the approaches they follow. These core syllable types are: CV, CVV and CVC. In a moraic theoretical approach, the types of possible syllable inventories in Arabic are constrained by the restriction of the number of moras within a syllable in a prosodic analysis, to which we now turn. Phonological theory recognises a number of prosodic structures, including the mora, the syllable and the foot. These prosodic constituents are arranged in a hierarchy as discussed by McCarthy and Prince (1990: 3) and illustrated below in 1.6.

(1.6) Prosodic hierarchy

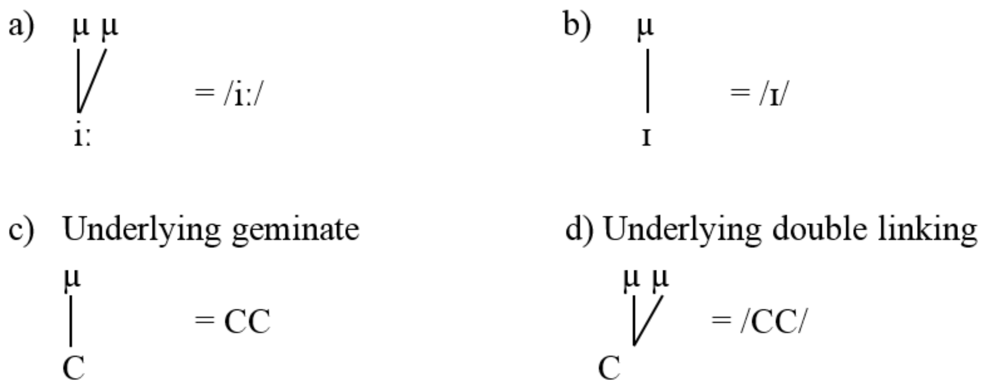
Phonological Word	ω
Foot	Σ
Syllable	σ
Mora	μ

What concerns us here is the identity of the 'mora' (μ), as in a prosodic theory, it is identified with syllable weight proposing that light syllables are monomoraic and heavy syllables are bimoraic. McCawley (1977: 265) defines the mora as "… something of which a long [heavy] syllable consists of two and a short [light] syllable of one". Prince (1983: 52) characterises the moraic segment in a syllable, as the first vowel and he (as well as Hyman, 1985) further specifies that any segments following the vowel can be moraic, subject to language specific constraints. The syllabicity requirement is different from that of moraicity. Thus, in Lithuanian, for example, while a syllabic constituent should be [-consonantal], a moraic constituent can be any [+ sonorant] constituent. The moraic segments in different languages vary from being only a vowel (Khalkha Mongolian and Yidiɲ), any sonorant (Lithuanian and Tiv) or even an obstruent (English, Arabic and Latin) (Abraham 1940; Street 1963; Arnott 1969; McCarthy 1979a; Hayes 1981; Halle & Vergnaud 1987), as reported in Zec (1995: 89).

In moraic theory (e.g. Hayes 1989), heavy and light syllables are distinguished according to the number of moras a syllable may contain. Hence, a light syllable is that which contains one mora, whereas a heavy syllable is that which contains two moras.

Ideally speaking, vowels and geminates are underlyingly moraic, while single consonants are not. This implies that CV and CVC are monomoraic, while CVV and CVG are underlyingly bimoraic. Accordingly, the following analysis shows the representation of light and heavy syllables.

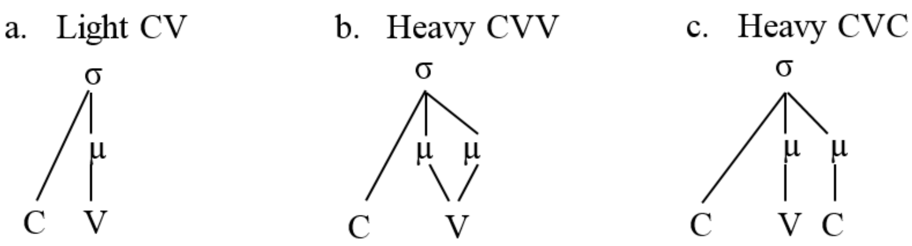
(1.7) Heavy and light syllables in moraic phonology (Adapted from Hayes, 1989: 256-257)



Assigning a single mora to the geminate in (c) above indicates that they, opposite to single consonants, underlyingly bear a mora. However, (d) demonstrates a case where nasals are underlyingly long in some languages, such as Kimatuumbi (Odden (1981), as cited by Hayes (Ibid))

Nonetheless, in some languages, CVC may be perceived to be heavy. In some languages the position of the CVC determines its heaviness, although in others it is heavy no matter what its position in an utterance is and no matter what type the last C is. Yet in other languages the type of final consonant determines whether it is to be considered moraic or not. In Arabic, for example, a medial heavy syllable is one of the basic structures CVV or CVC (having two moras)[6], whereas a light syllable has the structure CV. The prosodic structures of these syllable inventories, adopted from McCarthy and Prince, are shown below:

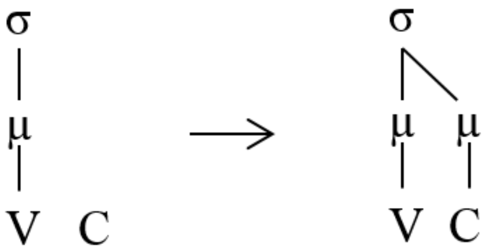
(1.8) Medial heavy and light syllables in Standard Arabic (McCarthy and Prince 1990)



[6]Syllables that have the structure CVVC and CVCC will be discussed later.

Nevertheless, in moraic theory, CVC is not always heavy in Arabic dialects. Its heaviness, in these languages, is considered according to its position in an utterance. Thus, a final CVC is light word-finally but heavy word-internally. Its heaviness is obtained by Hayes's parametric rule "weight-by-position" which implies that single consonants are underlyingly non-moraic and that consonants in coda positions obtain a mora by position. According to Hayes, prevocalic consonants are not assigned moras and therefore, can never gain weight by position.

(1.9) Weight-by-position Rule (Hayes, 1989: 258)



Universally speaking, languages differ in whether CVC behaves as heavy or light, depending on whether or not the 'C' is not a weight bearer, and especially, if this moraic C is underlyingly moraic or not. Several other languages consider it heavy in cases when the last 'C' is [+sonorant] and light when it is [-sonorant] (Lithuanian for example (Zec, 1995)), or according to its position in the utterance, as previously mentioned. Consequently, in this respect languages are divided in to four particular types:[7]

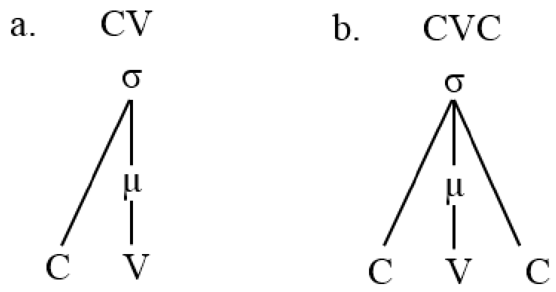
Table 1.1: Language types with regards to syllable weight

Language types	**Light syllables**	**Heavy syllables**
Type 1	CV, CVC	CVV
Type 2	CV, CVC (last C is [-sonorant])	CVV, CVC (last C is [+sonorant])
Type 3	CV, CVC	CVV, CVC
Type 4	CV	CVV, CVC (last C is any consonant)

In languages where the last C in CVC is not moraic, the prosodic representation is as follows:

[7] See Zec (ibid) and Tranel (1991) for examples and broader discussion.

(1.10) Light syllables



Thus, in languages where the last C is considered light, researchers claim that the C is invisible to the weight-by-position rule, since it is considered extrametrical[8]. This means that this C still belongs to the same syllable, although it is linked immediately to the syllable node rather than to the mora node, which implies that it is syllabified at a later stage in the derivation (Watson, 2002: 54).

The question that arises here is why the second ‘C’ in CVC is moraic in some instances, in such languages as Arabic? An answer to this question can be obtained by recalling the maximality requirement that a minimum phonological word should contain a foot and that a foot should be minimally bimoraic. This means that the existence of self-standing CVC words might imply the moraicity of coda-consonants. This might not be the case with other languages though, seeing that some researchers claim, “Minimal words aren’t minimal feet” where “the minimal word syndrome is not connected to foot structure” (Garrett, 1999: 68).

McCarthy and Prince (1990: 5-7) discuss some evidence in favour of classifying CVC as heavy. One is with regards to the stress assignment, where CVV and CVC syllables are stressed in words such as /jaˈquːlʊ/ ‘say, 3.SG.M.’ or /ˈqɑːlat/ ‘said, 3.SG.F.’. Arabic in this way, simply follows, in most cases, the generalisation that heavy syllables are stressed. Thus, the assignment of the stress to the penultimate of the first and second words achieves this universal requirement.

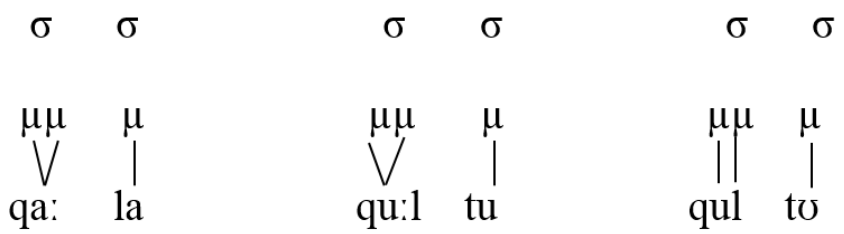
In MSA, in addition to some other dialects, final syllables receive stress only if they have the structure CVV, CVCC or CVVC. CVC resists stress in final positions although it is heavy in non-final positions. Thus, in Egyptian Arabic /ˈmaktab/ ‘office’, that has the structure of two

[8] Extrametricality is a rule-based devise that is used to capture the ignorance of stress rules by certain syllables. The notion is first introduced in Liberman and Prince's (1977) article in capturing “the apparent exclusion of certain English suffixes from the domain of stress rules” (Hyde, 2011). The issue of extrametricality is discussed below in chapter four.

successive CVC syllables, has the stress on the penult where it is considered heavy, whereas the final CVC must be light under the extrametricality analysis where its final C is not assigned a mora and thus does not contribute to the syllable weight.

Another piece of evidence of the bi-moraicity of CVC is, as McCarthy and Prince argue, the behaviour of CVVC where the long vowel is shortened in closed syllables in Standard Arabic as well as in some Arabic dialects. This can be clearly attested in 'hollow verbs'[9], where a long vowel in an open syllable, such as that in /qaː.la/ 'said, M.' is changed to a short vowel in a closed syllable: /qʊl.tʊ/ 'said, 1.SG.' (Underlyingly: /guːl.tʊ/). This process is evidence that a syllable in Arabic cannot be larger than two moras; it is confirmation also that consonants in coda positions are moraic. The representation below indicates Bimoraicity in Arabic.

(1.11) Syllable bimoraicity in Arabic (Evidence from the hollow verbs)



Compensatory lengthening is another indication of the bi-moraicity of syllables in Arabic discussed by McCarthy and Prince (ibid) where, although the syllable structure is changed by losing the syllable-final consonant and lengthening of the vowel, the weight of the syllable remains the same. Hence, the underlying form /ʔaʔ.θar/ 'prefer' (with the first syllable having two moras) surfaces as /ʔæθar/ (with the first syllable's two moras retained), as shown below:

[9] Hollow verbs are those whose roots have either /w/ or /j/ in the middle which usually change to /aː/ or /æ/ in past tense forms and to /uː/ or /iː/ respectively in present and infinitive forms. An example is /kwn/ 'be' /kæna/ 'was' /jakuːnu/ 'is'.

(1.12) Representation of /ʔaʔ.θar/ and /ʔæθar/

In brief, McCarthy and Prince’s argument reveals that syllable structure in Arabic is maximally bimoraic counting both CVC and CVV as equal in this respect with the ability of syllable-final consonants to bear moras, though a word-final CVC is non-moraic.

To conclude this part of the discussion, it is worth reiterating that the notion of prosodic analysis in Arabic is built on the fact that the Arabic syllable is maximally bimoraic. Given that, Arabic syllable structure is limited to only one or two moras which indicate that no syllables with three moras are allowed in Arabic and syllables that might exhibit this need to be resyllabified. The previous few sections included discussion of the core syllables only. Other types of syllables will be dealt with under extrasyllabicity in the following section.

1.7. Arabic morphology

The emergence of prosodic morphology in the 1980s grew out of the analysis of Classical Arabic when McCarthy first introduced non-concatenative morphology, where CV-sequences are attached as independent morphemes to stems (McCarthy, 1979b). This approach is based on non-linear phonology where information about segments is represented on different tiers using “association lines” from autosegmental phonology. This level of representation is called the CV-skeleton given that it is a representation of the Cs and Vs of specific classes of words where the prosodic template of, for example /kætɪb/ ‘writer’ consists of CVCVC, where the Cs belong to one morpheme (the root) and carry the basic semantics of the forms and the specific grammatical information is then expressed by the vowel melodies (the Vs tier), which are interleaved with the consonants of the stems.This is revealed in (1.13) below and will be shortly discussed further.

(1.13) Representation of /kætɪb/

```
  k t b
 /  |  \
 CVCVC
  \  /
  æ ɪ
```

Presenting first an overview of Arabic prosodic morphology helps with the understanding of word structure, which consequently leads to a better understanding of syllable structure in Arabic.

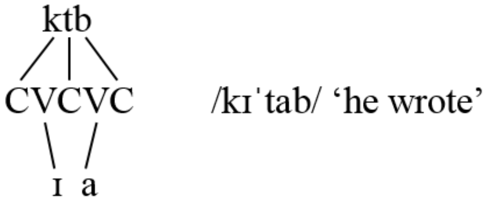
The theory of prosodic morphology combines non-linear phonology and morphology. The emergence of prosodic morphology appeared when McCarthy (1981), (1982), (1983), (1984) and McCarthy and Prince (1990) analysed data from Arabic and other Semitic languages making use of autosegmental strategies to account for “morphological regularities”. The morphology of the Semitic languages, in general, and Arabic, in particular, are described to be non-concatenative, associating consonantal and vocalic elements using the Universal Association Convention (UAC) that associates autosegmental units in a one-to-one, right-to-left basis (Goldsmith 1976; McCarthy 1982) (as cited in Watson, 2002: 126). The Arabic language morphology, therefore, is based on the idea of applying a wide range of morphological alternations to the stem using the autosegmental association rules. In this way, Arabic word formation is built on the idea of applying different vowels to the same stem so that different related derivations are created “ablaut” (Ryding, 2005: 46). This is illustrated in some of the word derivations from k-t-b outlined beneath:

(1.14) The formation of √/k-t-b/ ‘write’ in Arabic

/katab/	wrote, 3.SG.M.
/kætab/	corresponded, 3.SG.M.
/kʊtɪb/	was written 3.SG.M.
/kɪtæb/	book
/kʊtʊb/	books
/kætɪb/	writer
/ʊktʊb/	write!
/maktabah	library

The choice of a specific form depends on the grammatical information that needs to be added to the stem morpheme. Thus, the creation of any verb form depends on grammatical information, such as tense/aspect, person, mood (indicative, subjective, imperative or jussive), gender (masculine or feminine), number (singular, dual or plural) and voice (active or passive), and case (nominative, genitive or accusative). Illustrations of autosegmental representation in ALA are presented beneath making use of UAC:

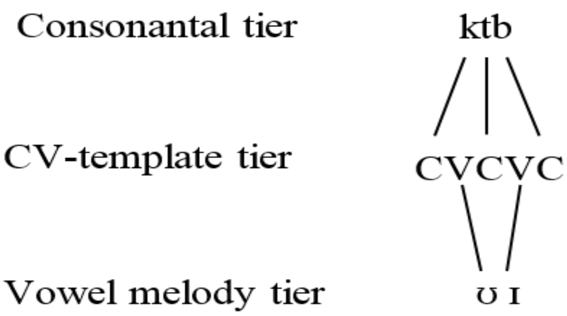
(1.15) Autosegmental representation of √/k-t-b/ in ALA



Thus a detailed presentation of the steps of autosegmental representation is discussed in the following section to provide an understanding of the application of phonological processes in such an Arabic dialect as ALA.

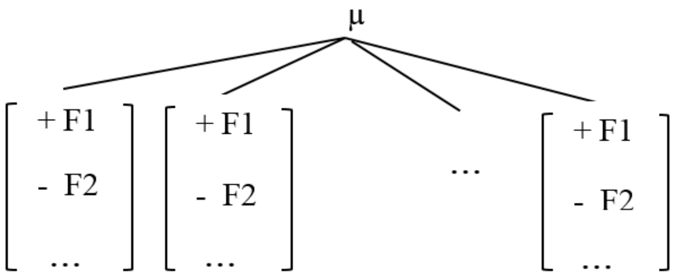
In prosodic analysis, elements of content words are represented on three different levels (called tiers) that signify different morpheme types; where the consonantal tier (the root) bears the main meaning of the lexeme (ktb ~ write); the templatic pattern (the CV skeleton); and the vowel melody which establishes different forms from the basic root: /kataba/ ‘wrote, 3.SG.M.’, /katabta/ ‘wrote, 2.SG.M.’, /kɪtæb/ ‘book’, /ɪnkatab/ ‘was, 3.SG.M. written’, /kætɪb/ ‘writer’, etc. The assignment of segments in each level therefore allocates consonantal and vocalic tiers on a one-to-one basis from left to right using association lines. The word /kʊtɪb/ ‘it, 3.SG.M. was written’ covers the consonantal root /ktb/, the vocalic melody /ʊ-ɪ/ and the skeletal template CVCVC, as shown below.

(1.16) The representation of kutib (McCarthy (ibid))



McCarthy's (1981: 376 and 383) prosodic theory is built on his definition of the 'morpheme' as "… a set of feature matrices dominated by a single μ." As shown in his model represented below, the 'μ' bears all the phonological information.

(1.17) Morpheme structure in prosodic theory (McCarthy, 1981: 377).

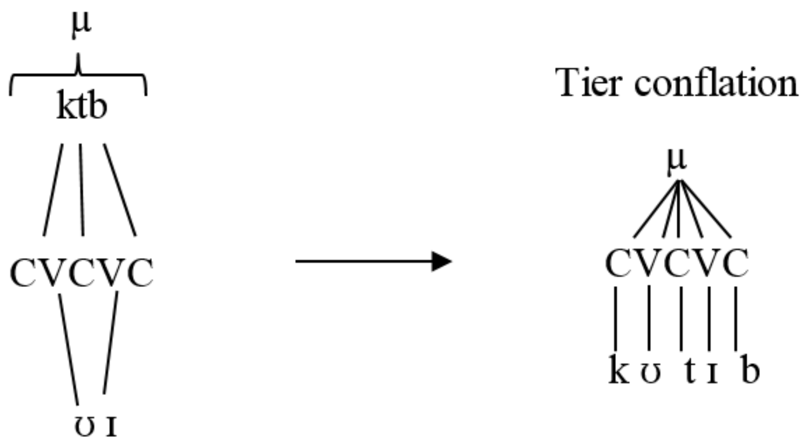


The regulations and procedures, in relation to how autosegmental analysis works, are as follows (McCarthy, 1981: 383):

- There is a restriction against the multi-association of segments from different tiers;
- Every tier contains only one set of phonological features;
- Any given set of features does not appear in more than one tier unless they represent different morphemes;
- "[E]ach autosegmental tier will designate a natural class on the segmental tier, as its set of tone-bearing elements, the units which it is to be associated."

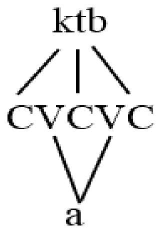
In the next step, "tier conflation", originally suggested by Younes (1982) to overcome some phonological problems such as that related geminate, makes the melodic template a pronounceable and recognisable word by linearising the vowels and consonants to be shown in a single tier.

(1.18) The prosodic representation of /kʊtɪb/ ‘was written’



According to McCarthy's (1979a, 1981, 1986) version of the Obligatory Contour Principle (OCP), identical segments in the vocalic melody are expressed by only one vowel.[10] The representation beneath in (1.19) demonstrates how /katab/ ‘wrote, 3.SG.M.’ is represented following the OCP.

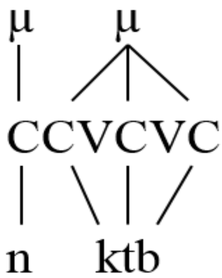
(1.19) Identical segments in the vocalic melody.



As McCarthy states, the consonantal and the vocalic melodies of the stem form a single ‘μ’. If an affix exists, its segments will appear under a separate ‘μ’ node in a separate tier from that of the root and its segments are mapped to the prosodic tier prior to that of the root obeying the one-to-one stipulation. Thus, the representation of /nkatab/ (formed by adding the prefix /n/)[11] is as shown below with the affix occupying the left most consonantal node. After that the root segments are mapped to the rest of the templatic slots following the same procedure (one-to-one, left-to-right). The representation of /nkatab/ is as follows:

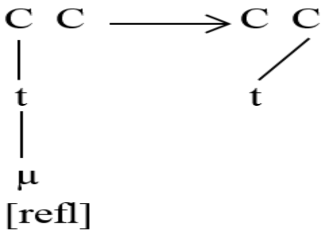
[10] We will shortly see how this works for gemination.
[11] The case of the existence of initial consonant clusters such as /nk/ will be discussed later.

(1.20) The prosodic representation of the prefix in /nkatab/ (McCarthy, 1981: 389)



This idea of mapping affixes before stems makes the mapping of infixes problematic where an infix such as the reflexive /t/ in /ktatab/ (where the first 't' is an infix) is expected to occupy the first consonantal slot of the template CCVCVC. A solution to this problem is suggested by McCarthy (restricted to this affix and called the "Eighth Binyan[12] Flop") that shifts the association from the first consonantal slot to the second adjacent consonantal slot (with no intervening vowels) as depicted below:

(1.21) Eight Binyan Flop (McCarthy, 1981, 390)



To sum up this part, a clarification should be assigned regarding the prosodic morphological analysis, which signifies that although the prosodic analysis is adopted from 'autosegmental phonology' (Goldsmith, 1976), there is a difference between autosegmental phonological representation and the prosodic morphological one. Hence, in autosegmental phonology the three morphemes of the word /nkatab/, for example, are represented in the three different tiers, as previously mentioned.

[12] A Hebrew term McCarthy (1981: 377) uses to refer to the different derivations of the word in Arabic and other Semitic languages (plural: binyaním)

Chapter 2. The phoneme system of Al'ain Libyan Arabic (ALA)

2.0. Introduction

This chapter provides a phonemic, as well as a phonetic description of ALA consonant and vowel inventories and systems. The classification of the dialect inventory is obtained by presenting minimal pairs for both consonants and vowels. In the phonetic classification, the issue of the status of emphatics is discussed and the difference between emphatic phonemes and emphatic allophones is outlined. Glottal loss leading to compensatory lengthening is a feature that exists in ALA, similar to other Arabic dialects. This issue is also tackled under §2.2. Finally, the consonant gemination in ALA is looked at in brief under §2.3.

As Hoberman (1996) states, the Arabic Language, as well as other Semitic languages, for instance Hebrew, Tigrinya, Amharic and Aramaic, are well known for their use of the pharynx as a main and secondary place of articulation, producing sounds (consonants and co-articulation such pharyngealisation, velarisation, labialisation) in the pharyngeal and uvular region. The studies in the literature regarding this phenomenon adopt different approaches, such as acoustic analysis, rule-based phonology, autosegmental phonology, and so on. However, discussing such cases in detail is beyond the scope of this study. Therefore, a review of the literature is discussed later in this chapter with a focus on the characteristics of emphasis in ALA, followed by a brief discussion of the process of "emphasis spread" in this particular dialect. Later in this chapter we will observe that, although there are only four underlying emphatics in ALA, most (if not all) plain phones have the emphatic counterparts as their allophonic alternations. The section also discusses the setting for such emphatic alternations and the case and direction of emphasis spread in this dialect.

2.1. Consonants in ALA

In this section, the list of consonants that exist in ALA will be identified. Phonetic, in addition to phonemic analysis will be conducted.

2.1.1. The phonetic analysis of ALA consonants

Fifty-four phones have been identified in this thesis for ALA. These are illustrated below to be investigated, in order to establish whether any can be categorised as allophones to the same phonemes. The table below demonstrates all of the possible phonetically established consonants in ALA obtained from investigated utterances. Examples will follow.

Table 2.1: The phonetic inventory of ALA

	Labial	**Labio-dental**	**Inter-dental**	**Dental-alveolar**	**Alveolar**	**Alveo-palatal**	**Palatal**	**Velar**	**Pharyngeal**	**Laryngeal**
Plosive	b			t, d				k, g		ʔ
plosive emphatic	b̂			t̂, tˤ, dᵔ[13]				k̂, ĝ		ʔ̂
Fricative		f	ð, θ		s, z	ʃ, ʒ		x, ɣ	ħ, ʕ	h
fricative emphatic		f̂	ðˤ, ð̂, θ̂		sˤ, zˤ, ŝ, ẑ	ʃᵔ, ʒᵔ		xᵔ, ɣᵔ	ħ̂, ʕ̂[14]	ĥ
Nasal	m	ɱ		n				ŋ		
Nasal emphatic	m̂			n̂						
Lateral				l						
Lateral emphatic				l̂						
Rhotic					r					
Rhotic emphatic					r̂					
Glide	w						j			
Glide emphatic	ŵ						ŷ			

As some of the phones in the previous table are believed to be allophonically related (as will be demonstrated shortly), a phonemic inventory needs to be established for the dialect at this point by investigating the allophonic sounds. There are two types of allophones in ALA: one is the result of emphatic spread, as we will see below, whilst the other is the result of other assimilation processes. Thus, the difference between underlying and allophonic emphatics is addressed in the following section.

The other two allophones left are thus the [ŋ] and [ɱ] which occur in a similar environment to those of British English. The [ŋ] can be heard when a combination of either /nk/ or /ng/ occurs

[13] It is worth highlighting that the emphatic phonemes are different from the emphatic allophones. Further discussion of where such phones are considered either phonemes or allophones will follow. In this thesis I will be using different symbols for the underlying emphatics to distinguish them from the derived emphatics. Thus ‘ˤ’ will be used to show underlying emphatics and ‘ᵔ’ for allophonic emphatics. The difference between the phoneme and the allophone will follow.

[14] The pharyngeals and plosives also have emphatic allophones in context of emphasis spread.

in the dialect, as a result of assimilation where the non-coronal nasal is changed to a coronal one having the alternation n ~ ŋ. Such words are: /xɑːngah/ [xɑːŋgah] 'strangling, M.3.SG. him' and /mɪnkʊm/ [mɪŋkʊm] 'from you, Pl.'. Conversely, [ɱ] occurs as a result of assimilating 'n' to 'f' in words such as: /nfɑːˤsˤ/ [ɱfⁿɑːsˤ] 'sandwiches' and /bɪnfuːtah/ [bɪɱfuːtah] 'will neglect, 1.SG. him'.

Let us now turn to the issue of emphatics to identify the underlined and derived ones. The following section starts with introducing the notion of Emphatics and studies that are conducted for Arabic. Following that is discussion related to ALA in specific.

2.1.2. Emphatics in ALA

"Emphatics" refers to a set of obstruents that are produced at the very back of the mouth (namely the pharynx) with a secondary articulation (a retraction of the tongue (Bin-Muqbil, 2006: 31)) such as pharyngealisation and velarisation.[15] Emphatics belong to a wider set of utterances called gutturals,[16] including uvulars, pharyngeals and laryngeals.[17] Zawaydeh (1999: 72) reports the results of Ghazeli (1977: 72) X-raying himself in an investigation of the articulation of gutturals. In observing the articulation of the emphatics, Ghazeli (in a similar investigation to that of Al-Ani) established that their secondary articulation is characterised by "the tongue-back retracting towards the pharynx at the level of the second cervical vertebrae".

There are four agreed emphatic sounds in Arabic in general (although it is controversial amongst researchers, where gutturals as 'q' might be included as an emphatic). These are: /tˤ, dˤ, ðˤ, sˤ/ as opposed to their non-emphatic "plain" counterparts /t, d, ð, s/.

There have been many attempts to comprehend the difference between the emphatics and their plain equivalents. Such acoustic investigations have varied from investigating the frequency difference (Al-Ani, ibid, Ghazeli, ibid, Giannini and Pettorino, 1982 and Norlin, 1987 amongst others) where either a slight difference or no difference in frequency between the two groups was reported.

[15] This is controversial amongst researchers. Al-Ani (1970) provides evidence of the favour of pharyngealisation by investigating the production of /tˤ/ using x-ray (As reported by Bin-Muqbil, ibid).
[16] "Gutturals" is a natural class in Arabic, which include uvulars, emphatics, pharyngeals and laryngeals (Zawaydeh, 1999:23).
[17] As mentioned previously, the guttural set is a distinctive feature of the Semitic languages although is not limited to it being existent in other language groups, for instance the Caucasian and North American groups of languages (Zawaydeh: 23).

The following table describes the place of articulation of the different emphatics /tˤ, dˤ, ðˤ, sˤ/ compared to their plain (non-emphatic) counterparts /t, d, ð, s/ as adopted from Al-Solami.

Table 2.2: Emphatics vs. plain consonants in Arabic (Al-Solami, 2013: 314)

	Dental		**Alveolar**	
	plain	**emphatics**	**plain**	**emphatics**
Plosives	t	tˤ	d	dˤ
Fricatives	ð	ðˤ	s	sˤ

ALA has four underlying emphatic phonemes; these are /tˤ/, /ðˤ/, /sˤ/ and /zˤ/, as opposed to MSA that have the same first three emphatics /tˤ/, /ðˤ/ and /sˤ/ in addition to /dˤ/ that is not recognised in ALA as a phoneme and is systematically substituted with /ðˤ/ as we will see later. The alveolar fricative emphatic phoneme /zˤ/ is only found in very few words in ALA. Such words are /zˤʌrɪf/ 'envelope' (MSA form is /ðˤʌrf/) and /zˤoros/ 'molar', (MSA form is /dˤɪrs/). The following table explains the four emphatics in ALA.

Table 2.3: Emphatics in ALA

Feature	**Symbol**	**Example**	**Gloss**
Dental-alveolar plosives	tˤ	/tˤeːr/	bird
Inter-dental fricative	ðˤ	/ðˤabaʕ/	hyena
Alveolar fricative	sˤ	/sˤagɪr/	eagle
	zˤ	/zˤorɪs/	molar

To demonstrate the difference between the emphatic sounds and their non-emphatic counterparts a few examples are presented below. The examples are in fact near-minimal pairs rather than real minimal pairs. The non-existence of the minimal pairs is because of the fact that emphasis is spreadable where adjacent vowels and consonants are (to some extent) in some way influenced by the emphatics. This process is called emphasis spread and results in the existence of the emphatic allophone set found in ALA. Let us first consider the main emphatics, and then follow this with a discussion of the case of the emphatic allophones. Examples of near-minimal pairs for the four emphatic phonemes that exist in ALA are given below.

Table 2.4: Near-Minimal Pairs for Emphatic Consonants in ALA

Phoneme	**Example**	**Gloss**	**Phoneme**	**Example**	**Gloss**
/tˤ/	[tˤiːn]	clay	/t/	[tiːn]	fig
/ðˤ/	[ðˤʌb̂b̂aħ]	called	/ð/	[ðæbbaħ]	butchered
/sˤ/	[sˤɑːm̂]	fasted	/s/	[sæm]	poisonous
	[sˤʌd̂d̂]	repulse		[sad]	dam
/zˤ/	[zˤʌr̂ôf]	envelope	/ħ/	[ħʌrʊf]	Alphabetical letter

As can be seen from the examples above, there is an assimilation of the consonants where /m/, /b/, /d/ and /r/ are produced as [m̂], [b̂], [d̂] and [r̂] wherever an emphatic happens to occur, and hence are said to be allophones of the plain equivalents. There is also some kind of change that occurs to the vowels adjacent to the emphatics. Similarly, almost all plain phonemes behave in the same way having emphatic allophones. Broselow (1976: 32) mentions that all plain constituents have emphatic counterparts, except the MSA sound /q/ (which nowadays does not exist in most Arabic dialects). As pointed to earlier, the symbol ̂ is used to confirm the derived emphatic that exist in the dialect.

The effect on neighbouring vowels is also noticed in the literature under acoustic analysis, measuring the difference in frequency between phonetically influenced and non-influenced vowels, where some vowels (such as s/ɪ/) are said to exhibit a variation of frequency when adjacent to an emphatic consonant, while other vowels (such as /a/) do not demonstrate such a change.[18]

In addition to the main emphatics mentioned earlier, Zawaydeh also argues that the sounds /mˤ, bˤ, lˤ/[19] are emphatic phonemes that exist in Ammani-Jordanian Arabic calling them “secondary emphatics” and claiming that they do not have non-emphatic counterparts, asserting that their existence in words is distinct, although occurring in a limited number of words. Consider below.

[18] A review of the literature in this respect can be located in Bin-Muqbil (2006: 37-38), including Obrecht (1961) and El-Dalee (1984) amongst others.

[19] Symbolised as [m̩, b̩, l̩] in Zawaydeh's study.

(2.1) Secondary emphatics in Ammani-Jordanian Arabic (Zawaydeh, 1999: 26).[20]

Word	Gloss
bˤaabˤa	dad
ʔlˤlˤa	God
ylˤlˤa	let's go
walˤlˤa	by God's name
mˤayya	water

The claim that can be made at this point is that, for ALA, the emphatic [l] is only an allophone (symbolised as [l̂] in the current study) since the word for 'God' has two pronunciations either with plain or emphatic [l], depending on the environment. Consider the following examples pronounced in ALA where the /l/ phoneme is pronounced in two different ways in the same word in various situations.[21]

Table 2.5: [l] versus [l̂] in ALA

Word	Transcription	Gloss	Word	Transcription	Gloss
ʔallah	[ʌl̂l̂ʌh]	Allah	—	—	With Allah
wallah	[wʌl̂l̂ʌh]	by Allah's name	lillaah	[lɪllæh]	To Allah
mashaaˤ ʔllah	[maʃa:l̂l̂ʌh]	as Allah wills	bism illah	[bɪsmɪllæh]	In Allah's name

The examples above signify that wherever the preceding vowel is /a:/ or /ʌ/ the /l/ is pronounced as emphatic [l̂]. Furthermore, wherever the vowel is /ɪ/ the /l/ is pronounced as [l]. The influence of the vowels /a:/ and /ʌ/ will be discussed under vowels investigating their effect on adjacent sounds when no emphatic consonants are present in the utterance.

Similarly, the choice between [m] and [m̂] and [b] and [b̂] depends on the surrounding vowels in these cases (when no emphatics happen to occur in the word). The following examples illustrate that wherever we have the emphatic allophone, the accompanying vowel is either [a:] or [ʌ] and wherever we have non-emphatics, the vowel is /ɪ/. We can assume then that it might be the vowel that has affected the pronunciation of these phonemes. This assumption still needs to be investigated, although given that this is beyond the scope of this thesis, we will not generalise the argument regarding Zawaydeh's assumption shown above. The consonants will be considered emphatic allophones that are influenced by the spread of emphasis from adjacent emphatic vowels, which exist in ALA, as the data for [m̂] and [b̂] below illustrates.[22]

[20] Roman orthographic transcription is used for Zawaydeh's examples.
[21] This can be generalised for MSA although it will not be discussed in the current study.
[22] Emphatic vowels are thouroughly discussed under §2.6.

Table 2.6: /m/ and /b/ in ALA

Word	Gloss	Word	Gloss
[mæja]	a Libyan city	[m̂ʌjja]	water
[nmɪt]	hurry up, 1.SG	[nm̂ʊtˤ]	I stretch
[bajjæʕ]	noblewoman	[ḅʌjja]	shoe polish
[bjɪd]	with a hand	[bjuðˤ]	got whiter

2.1.3. Allophones in ALA

2.1.3.1. Emphatic allophones

As discussed above, ALA has only four emphatic phonemes. These are: /tˤ/, /ðˤ/, [sˤ/ and /zˤ/. Other non-plain phones are alleged to be emphatic allophones of their plain counterparts. These are: [b̂], [t̂], [d̂], [k̂], [ĝ], [ʔ̂], [f̂], [θ̂], [ð̂], [ŝ], [ẑ], [ʃ̂], [ʒ̂], [x̂], [ɣ̂], [ħ̂], [ʕ̂], [ĥ], [m̂], [n̂], [l̂], [r̂], [ŷ] and [ŵ] being in fact allophones of the phonemes /b/, /d/, /k/, /g/, /t/, /s/, /z/, /ʔ/, /f/, /x/, /ɣ/, /ħ/, /ʕ/, /h/, /m/, /n/, /l/, /r/, /j/ and /w/ respectively.[23]

These emphatic allophones appear to occur in two environments in ALA. In one environment, emphatic consonants do not exist in the utterance and therefore the source of the emphasis influence is said to be the vowel in the utterance. This setting will be discussed shortly. The other environment for emphasis to spread is when one of the four emphatic phonemes co-occurs in the word and cause the rest of the word (or part of it) to be emphatic. This process is called "emphasis spread," and a great deal of work has been undertaken (including, but not limited to Munther (1993), Davis (1995) and Watson (1999)) to investigate the direction and the distribution of emphasis when an emphatic consonant occurs.

To investigate directionality and other factors in ALA, let us first discuss the distribution of emphatics and moreover, consider the examples below.

[23] Notice that while the allophones [t̂], [ð̂], [ŝ] and [ẑ] are derived, /tˤ/, /ðˤ/, /sˤ/ and /zˤ/ are underlying, the emphatic [d̂] is only detected as an allophone of its phoneme /d/ in ALA. Such an example is]ðˤɪfd̂aʕ] 'frog'.

Table 2.7: Emphasis distribution in ALA

Initial		**Medial**		**Final**	
Word	**Gloss**	**Word**	**Gloss**	**Word**	**Gloss**
/tˤɑːbʌʕ/	stamp	/bʌtˤtˤah/	duck	/ħʌtˤtˤ/	put, 3.SG. M.
/tˤeːr/	bird	/ʕʌtˤtˤɪl/	be late, 3.SG. M.	/xʌtˤtˤ/	font
/tˤiːn/	clay	/bʌtˤɪn/	stomach	/ʒɪlʌtˤ/	coagulated, 3.SG. M.
/sˤʊbaħ/	morning	/mʌsˤɪr/	Egypt	/rʌsˤsˤ/	bus
/sˤabɪr/	patience	/tʌsˤnaʕ/	make, 3.SG. F.	/xɪlɑːsˤ/	enough!
/ðˤɪbæb/	fog	/bðˤɑːʕʌh/	goods	/ʔʌrɪðˤ/	earth
/ðˤʌbaʕ/	hyena	/tɪðˤlɪm/	abuse, 3.SG. F.	/ħʌðˤðˤ/	luck
/zˤoros/	molar	—	—	—	—

As the data above portrays, emphatics exist in all positions in ALA: word-initially, medially or finally with a very restricted number of instances for /zˤ/. Emphatics also occur in onset as well as coda positions, as the examples above reveal. They exist with any type of vowel available in the dialect. Nonetheless, the occurrence of emphasis spread is not indicated above, as this is discussed in the following section.

2.1.3.2. Emphasis spread in ALA

Emphasis freely spreads progressively (left-to-right) and regressively (right-to-left) in Arabic dialects, although progressive spread is said to occur more frequently (Ghazeli, 1977 amongst others). In a phonological theory, researchers illustrated analysis of this phenomenon under different phonological domains. These are, as mentioned in Israel et al. (2012), the syllable, the phonological word, the uninflected word, only the vowel to the right, or unbounded leftward within word referring to different works such as Watson’s (1999), Zawaydeh (1999) and Younes (1982 & 1993) amongst others.

To investigate the direction of and restrictions on emphasis spread in ALA, consider the examples exhibiting instances for the occurrence of the emphatic /tˤ/[24] below, where emphatic allophones, syllable boundaries and stress are indicated.

[24] One emphatic is chosen to create consistency and to reduce the use of several new symbols. This can be generalised for the other emphatics though.

Table 2.8: Emphasis influence in ALA

monosyllabic		**Progressive spread (R-to-L)**		**Regressive spread (L-to-R)**	
Word	**Gloss**	**Word**	**Gloss**	**Word**	**Gloss**
[ˈb̂ʌtˤtˤ]	ducks	[tˤɪ.ˈlæ]	painted, M.	[ˈb̂ʌ.tˤɪn]	tummy
[ˈʃ̂ɑ:tˤ]	is burnt, M.	[tˤɪ.ˈlaʕ]	went out	[b̂ɪ.ˈtˤɑ:]	late, M.
[ˈtˤɑ:b̂]	is cooked, M.	[tˤɪ.ˈlɪt]	painted, F	[b̂ɪ.ˈtˤe:t]	late, 1.SG.
[ˈtˤɑ:f̂]	flew	[ˈt̂ɪ.l̂otˤ]	touch by mistake, F.	[b̂ɪ.ˈtˤʌl̂]	is invalidated, M.
[ˈtˤe:r]	bird	[ˈtˤmɪʕ]	be greedy, M.	[ˈba.tˤɪl]	hero
[ˈtˤi:n]	clay	[tˤɪ.ˈm̂ʌʕ̂]	greed	[ɪx.f̂ɪ.ˈl̂ʌtˤ]	is mixed up
[ˈx̂ʌtˤtˤ]	inscribed, M.	[ˈtˤɑ:.b̂ʌʕ̂]	stamp	[in.ʒ̂ɪ.ˈl̂ʌtˤ]	is coagulated
				[ɪr.f̂ɪ.ˈb̂ʌtˤ]	is attached
				[ˈme.ŝe:.tˤe.f̂ah]	ruler, Dim.
[ˈtˤʌb̂b̂]	hit suddenly	[tˤɑ:.ˈb̂u:f̂]	queue	[f̂ɪ.ˈb̂ʌtˤ]	attached, M.
[ˈtˤɪb̂b̂]	medicine science	[tˤɪ.ˈbi:.bah]	doctor, F.	[ˈf̂ʌ.b̂ɪtˤ]	attaching
[ˈtˤɪn̂]	ton	[tˤɑ:.ˈgɪjjah]	hat	[ˈb̂ʌ.tˤɪ.ni:]	my tummy
[ˈĝotˤtˤ]	cat, M.	[ˈb̂tˤu:n.hum]	their tummies	[ʒɪ.ˈl̂ʌtˤ]	coagulated, M.
[ˈŝo:tˤ]	whip	[bɪ.tˤɪ.ŵɑ:.ˈbi:r]	with queues	[ˈb̂ɪtˤ.lɪt]	is invalidated, F.
		[ˈtˤʌn̂.ʒɪ.rah]	cooking pan	[ˈm̂ʌtˤ.bɪ.ʕah]	printing house

Monosyllabic words that contain an initial emphatic consonant and the following vowel is /ɑ:/, /o:/, /ʌ/ or /o/, have the entire syllable constituents emphasised. However, if the vowel is either /i:/, /e:/, /u:/, /ɪ/, /e/ or /ʊ/, the tautosyllabic consonant is un-emphasised; [ˈtˤʌb̂] vs. [ˈtˤɪb] and [ˈtˤɑ:b̂] vs. [tˤe:r]. Conversely, if the final consonant is an underlying emphatic, a regressive spread affects the entire syllable no matter what the vowel is; [ˈʃ̂ɑ:tˤ], [ˈb̂ʌtˤtˤ], [ˈŝo:tˤ] and [ˈĝotˤtˤ].

However, if a suffix is added to monosyllabic closed words that have initial emphatics and emphasis spread happens to occur rightwards, emphasis spread might not occur beyond the word boundary to the right if a plain-vowel-initial suffix is added. That is to say, if such a word is followed by a suffix that begins with /i:/, /e:/, /u:/ or /ɪ/, the emphasis spread is blocked: [ˈtˤɑ:b̂] 'is cooked, M.' vs. [ˈtˤɑ:.bit] 'is cooked, F.', [ˈtˤɑ:f̂] 'flew, M.' vs. [ˈtˤɑ:.ru:]

‘they flew’. An interesting observation is that when the affected consonant is a non-emphatic geminate, the second part of the geminate becomes non-emphatic, implying that the two parts of the geminate behave like adjacent identical consonants. In such a case, adding a vowel-initial suffix blocks the emphasis effect on the second part of the geminate, whereas the first part of the geminate is still [ˈtˤʌb̂b̂] vs [ˈtˤʌb̂bit] ‘hit, 3.SG.F. suddenly’ and [ˈzˤʌr̂] vs [ˈzˤʌr̂.rɪt] ‘expelled, 3.SG.F.’. Although as a native speaker (and in checking with other speakers of the dialect), it can be claimed here that emphasis spread affects only the first part of the geminate in such a case. It might appear impossible to identify such a situation; however, as a native speaker, by applying a pause between the two parts of the geminate it should be apparent for a native ear to propose such a thing. Nevertheless, this is simply a native speaker’s intuition and shall be considered for further research as future phonological and acoustic investigation will be of great interest. This can be used as evidence for the syllabification segments of a medial geminate as related to different syllables where the first part is associated to the coda of the first syllable and the second part is associated to the onset of the following syllable, as we will see shortly.

Rightwards spread does not spread over adjacent syllables when the following syllable is consonant-initial. The spread is blocked even though the emphatic is initial or final in its syllable: [ˈtˤʌn̂.ʒɪ.rah], [ˈm̂ʌtˤ.bɪ.ʕah] and [ˈmɪ.ŝeː.tˤɪ.r̂ah].

If the emphatic happens to occur in a non-initial syllable, regressive spread occurs across syllable boundaries only one syllable back: [ˈb̂ʌ.tˤɪn], [ˈb̂ʌ.tˤɪn], [ʒɪ.ˈl̂ʌtˤ], but:]ɪx.t̂ɪ.ˈl̂ʌtˤ], [in.ʒ̚ɪ.ˈl̂ʌtˤ] and [ɪr.t̂ɪ.ˈb̂ʌtˤ].

So far we have discussed emphasis spread in words that contain one of the four underlying emphatic consonants that occur in this dialect. However, emphatic allophones also occur in words that do not contain emphatic consonants. Nevertheless, not much work can be established regarding the effect of vowels on the choice between emphatic and plain neighbouring consonants. It is worth mentioning that, at this point, this observation can cause confusion, although it can be drawn as the source of emphasis in such cases.

Examples of “emphatic” vowels are those which exist in words similar to those that are claimed by Zawaydeh (1999: 26) (discussed earlier in this chapter) as being secondary emphatics where although no underlying emphatic consonants exist in the words, consonants in the words are nevertheless emphatics. In such an environment, a vowel preceding (or sometimes following) the allophones is either /ʌ/, /a:/, /o/, or /oː/.   Itis claimed, in this thesis, that these vowels are emphatics and that they spread this feature to adjacent consonants causing emphatic allophones to surface. Thus, the behaviour of such vowels is said to be similar to that of the consonants in relation to the directionality and domain of the emphasis process.

Table 2.9: Emphasis spread of vowels in ALA.

Word	**Gloss**
[k̂or̂ɑːʕ̂]	foot
[b̂ʌr̂r̂ʌ]	out
[r̂ʌb̂b̂ʌk̂]	your God
[r̂ɑːŝ]	head
[m̂ʌħʌmmed]	Muhammad ‘name’
[wʊf̂ɑː]	loyalty
[ɣɑːr̂]	became jealous, M.
[n̂ɪ.ħ̂ʌr̂]	slaughtered, M
[b̂orɪʒ]	tower
[xʷoːf̂]	fear
[ẑoːẑ]	two

Similar to ALA, emphatic vowels also exist in Cairene Arabic (Youssef, 2006: 14) as we will observe in §2.6.5.

To conclude, emphasis spread occurs in ALA in both regressive as well as progressive directions. Thus, the vowel plays a crucial role in emphasis spread across syllable boundaries. While progressive emphasis spread has the syllable as its domain, regressive spread travels over syllables to a maximum of one syllable back to the left.

Stress does not seem to affect emphasis spread as the position of the stress does not block spread. Thus, there is regressive emphasis spread in both [r̂ɪ.ˈb̂ʌtˤ] and [ˈr̂ɪ.b̂ʌtˤ].

It appears that the ideal vowels that co-exist with emphatics are the vowels /ʌ/, /o/ and /ɑː/ since they both phonetically prepare for the position of, or exist as a result of the production of emphatics. Needless to say, that the vowels /ɪ/, /iː/, /ʊ/ and /uː/ show some form of change as they become more retracted under emphasis spread. The influence of emphatics on neighbouring vowels is also investigated acoustically, where studies revealed a change in the frequency in simply the transition (for example in the vowels /ɪ/ and /ʊ/) or throughout the entire vowel (e.g., /a/). These include: Card (1983), Alwan (1986) and Jongman et al, (2007) amongst others.

2.1.4. The phonemic analysis of ALA consonants

The discussion above revealed that only twenty-eight phonemes can be extracted from Table 2.1 above for ALA and that the only allophones that occur in this dialect are the emphatic ones, the labiodental [ɱ] and the nasal [ŋ]. This is demonstrated using the 'minimal pairs' test. The following examples from ALA should be considered.

Table 2.10: Minimal pairs for consonant in ALA

Phoneme	Example	Gloss	Phoneme	Example	Gloss
/b/	/bæb/	door	/t/	/tæb/	repent
/t/	/xa:tım/	finger ring	/d/	/xɑːdım/	servant
/k/	/kılæ/	ate	/g/	/gılæ/	fried
/ʔ/	/sıʔal/	asked	/ʕ/	/sıʕal/	coughed
/tˤ/	/tˤɑːr/	it flew	/sˤ/	/sˤɑːr/	happened
/f/	/fæt/	passed by	/h/	/hæt/	fetch
/θ/	/kıθab/	dunes	/ð/	/kıðab/	lied
/s/	/seːf/	sword	/z/	/zeːf/	fake
/ʃ/	/ʃırɑː/	he bought	/ʒ/	/ʒırɑː/	ran away
/x/	/jıxıliː/	evacuate	/ɣ/	/jıɣıliː/	boil
/ʕ/	/ʕadd/	he counted	/s/	[sadd/	was enough
/h/	/hoːʃ/	predators	/ħ/	/ħoːʃ/	house
/ðˤ/	/ðˤılam/	abuse	/g/	/gılam/	pencil
/zˤ/	/zˤʌrıf/	envelope	/ħ/	[ħʌrıf/	letter
/m/	/læm/	blamed	/n/	/læn/	be flexible
/l/	/lıjja/	mine	/r/	/rıjja/	lung
/j/	/jɑːkıl/	he eats	/w/	/wɑːkıl/	eaten

As a consequence of this analysis, the twenty eight consonants that are discovered in ALA are explained in the following table, followed by a description.

Table 2.11: The phonemic inventory of consonants in ALA

	Labial	Labio-dental	Inter-dental	Dental-alveolar	Alveolar	Palato-alveolar	Palatal	Velar	Pharyngeal	Laryngeal
Plosive	b			t, d				k, g		ʔ
plosive emphatic				tˤ						
Fricative		f	θ, ð		s, z	ʃ, ʒ		x, ɣ	ħ, ʕ	h
fricative emphatic			ðˤ		sˤ, zˤ					
Nasal	m			n						
Lateral				l						
Rhotic					r					
Glide	w						j			

2.1.5. The Consonant System

Twenty eight consonant phonemes exist in ALA. These include seven plosives, fifteen fricatives, two nasals, one lateral, one rhotic and two glides. As has been discussed previously, only four underlying emphatics exist in this dialect. The existence of these phonemes was shown above using the 'minimal pairs' test. The characteristics of these consonants are discussed below.

2.1.5.1. Plosives

There are seven plosives in ALA: the voiced bilabial /b/, the dental-alveolars /t/, /d/ and emphatic /tˤ/, the velars /k/ and /g/ and the glottal /ʔ/.The emphatic alveolar stop /dˤ/ does not exist in ALA. Even with words that are pronounced with this sound in other dialects and in MSA, Rayyani people would substitute it with the interdental fricative emphatic /ðˤ/ whenever it happens to occur. Consider the examples from ALA compared with other Libyan Arabic dialects in addition to MSA[25].

Table 2.12: /dˤ/ and /ðˤ/ in ALA compared with MSA and TLA

ALA	**TLA**	**MSA**	**Gloss**
/ðˤɪlæm/	/dˤlɑːm/	/ðˤʌlæm/	darkness
/ðˤʌrɪf/	/dˤʌr(o)f/	/ðˤʌrf/	circumstance
/ðˤohʊr/	/dˤohor/	/ðˤohr/	noon
/ðˤʌhɪr/	/dˤʌhɪr/	/ðˤʌhr/	back
/ðˤʌww/	/dˤʌjj/	/dˤʌwʔ/	glow
/ðˤʌbaʕ/	/dˤʌbaʕ/	/dˤʌbʕ/	hyena
/ðˤʌbb/	/dˤʌbb/	/dˤʌbb/	lizard
/ðˤɪjjɪg/	/dˤɪjjɪg/	/dˤajjɪq/	tight
/ðˤɪħæ/	/dˤħɑː/	/dˤʊħʌ/	forenoon
/ðˤɑːʕ/	/dˤɑːʕ/	/dˤɑːʕ/	got lost

The uvular plosive /q/ is not in ALA phoneme inventory although it sometimes exist in some words that are borrowed from MSA. This is usually substituted with /g/ instead. The use of /q/ is only restricted to religious and legal words borrowed from MSA, where both higher educated people and recent generations would pronounce the /q/ sound instead of /g/ in these borrowed words. Such words are /qabiːla/ ‘tribe’, /qɑːnuːn/ ‘law’, /qɑːʕɪda/ ‘rule’ or ‘base,’ while the word /ʔafriːqɪja/ ‘Africa’ is only pronounced with /q/ in ALA. /q/ is also noticed to appear in words that recently entered the language such as: /naqqɑːl/ ‘mobile phone’. Pereira (2009: 548) claims that such words that contain this sound have minimal pairs: *stegsa* ‘went, 3.SG.M away’ ~ *steqsa* ‘found out’, 3.SG.M; *neggaal* ‘cheat’ ~ *neqqaal* and *hagg* ‘price’ ~ *haqq* ‘truth’. This, however, is not claimed with neither against in the current thesis.

2.1.5.2. Fricatives

Fourteen fricatives can be ascertained in ALA (including emphatic fricatives). These are the labiodental /f/, interdentals /θ/, /ð/ and emphatic /ðˤ/, alveolars /s/, /z/ and emphatic /sˤ/, palato-alveolars /ʃ/ and /ʒ/, velars /x/ and /ɣ/, pharyngeals /ħ/ and /ʕ/ and laryngeal /h/. These are the same as the MSA set of fricatives. The MSA affricate /ʤ/ does not exist in ALA and is

[25] Notice that it is not implied here that /dˤ/ is the underlying form as Rayyani children are basically only exposed to ALA and are not formally exposed to MSA till the age of six, when they start school.

always substituted with /ʒ/. Consider for example the word for ‘pilgrimage’ in both MSA and ALA respectively: /ħadʒ/ and /ħɪʒ/.

Furthermore, the sound /v/ does not exist in ALA although sometimes it can be heard in loan words such as /viːlla/ ‘villa’, /viːtɪ/ ‘screw’ and /veːlluː/ ‘bride’s gown’; with the choice of substituting it with /f/ amongst less educated people: /fiːlla/, /fiːtiː/ and /feːlluː/ respectively.

Similarly, however the affricates /ʧ/ and /ʤ/ do not exist in this dialect, these two sounds can be discovered in loan words such as /ʤabɑtˤiː/[26] ‘jacket’ and /ʧau/ ‘bye’ (from Italian *giubbotto* and *ciao*).

2.1.5.3. Nasals

Comparable to most Arabic dialects and MSA, ALA has only two nasals; /m/ as in /mɪriːðˤ/ ‘ill’ and /n/ as in /næs/ ‘people’. The existence of other nasal sounds, such as velar /N/, is only a result of the assimilation of the sound /n/ to the place of articulation of the following sound. Elramli (2012: 98-101) presents some examples from Misrata Libyan Arabic (MLA) to verify velar [ŋ] or labiodental [ɱ] surfaces in the dialect, as a result of the partial assimilation of the sound /n/ to the following velar /k/ and /g/ or fricative /f/ sounds respectively, either within words or phrases. Such examples that exist in MLA are: /ʕankabuːt/ ~ [ʕaŋkabuːt] ‘spider’, /xanfuːsa/ ~ [xaɱfuːsa] ‘beetle’, /mɪn + kallmɪk/ ~ [mɪŋkallmɪk] ‘who spoke to you?’, /mɪn + frɑːnsˤa/ ~ [mɪɱfransa] ‘from France’. Similarly, ALA exhibits these two allophones as mentioned earlier in this chapter.

2.1.5.4. Liquids

The lateral /l/ exists as both plain and emphatic in ALA. As we referred to previously, Zawaydeh’s claim that the emphatic [l̂] is a secondary emphatic phoneme is thought to be a consequence of the idea that emphasis spread in words occurs as a result of the existence of emphatic consonants in these words. Therefore, as she implies, the non-existence of emphatic consonants in words as *ʔllˤa* and *yllˤa* makes her conclude that such a sound is a secondary emphatic. However, as discussed under 2.1.2, the /l/ in such words is emphasised as a consequence of emphasis spread from the emphatic vowel. More examples of emphatic and plain/l/ -to those mentioned in table 2.5- are: [læbɪs] ‘pencil’, [ħall] ‘solution’, [l̂ɪĝiːtˤ] ‘foundling’ and [b̂ɑːl̂tˤah] ‘cleaver’.

The other liquid occurring in ALA is /r/ which also has an emphatic counterpart that occurs as a result of vowel emphasis spread in words as [rɪkʌb] ‘boarded, 3.SG.M.’, [bɪræ] ‘sharpened,

[26]Some ALA speakers would say /ʒabu:tˤi:/ with /ʒ/.

3.SG.M.’, [ʌħmʊr] ‘red’, [r̂ʌb̂bɪ] ‘my God’ and [b̂ʌr̂r̂a] ‘out’. The [r] can alternatively be a trill when geminated or in final positions. (Elramli, 2012: 12, Abumdas 1985: 37-38; Muftah 2001: 33)

2.1.5.5. Glides

The labial /w/ and the palatal /j/ exist in ALA. Again, as in the case with all other plain consonants, they have emphasised allophones that occur as an emphasis spread: /njɑːg/ ‘camels’, /zwɑːg/ ‘paint’, /jɑːkʊl/ ‘eat, 3.SG.M.’ and /hʊwwʌ/ ‘him’.

2.2. The glottal stop

There are two types of glottal stops in MSA, “underlying” (UG) and “epenthetic” (EG). While UG occurs in any word position (initially, medially and finally), EG occurs only utterance-initially. Contrary to the MSA, there is a tendency these days in Arabic dialects to lose both types of glottal stop in the middle of speech. The logical question at this point is why an underlyingly existent glottal stop behaves differently to other consonants by being deleted rather than by other phonological processes that are applied for consonants in similar situations (for example, vowel deletion or mora sharing). Answering such a question will reveal several facts regarding the glottal stop real identity and behaviour. A good question is also whether the difference in the identity of UG and EG is a phonetic one and if not (which is expected) then is it purely phonological? With regard to the real identity of the glottal stop behaving differently from other consonants, Hillenbrand and Houde (1996: 1128) reviewed several studies about the non-phonemic glottal stop, which concluded that “glottal stops are rarely produced with complete glottal closure” and thus, “are marked by some combination of a reduction in amplitude, a drop in fundamental frequency and, in some cases, irregular glottal vibration that are associated with glottal constriction” (referring to work completed by Fischer-Jorgensen, 1989; McCall et al, 1993; Pierrehumbert and Talkin, 1992; Priestly, 1976). As the current study is not a phonetic one, this important topic is an invitation for future research. Thus, phonologically centred, the behaviour of the glottal stop is demonstrated below in an attempt to answer at least the second question, for the sake of the current study and therefore, discussing the MSA case before identifying the ALA case.

2.2.1. Word-initial glottal stop in traditional Arabic grammar

Traditional Arabic grammarians differentiated between two types of “hamza” word initially; these are “hamzatul-qatʕi” ‘non-connecting hamza’ and “hamzatul-wasˤli” ‘connecting/elidable hamza’ henceforth, HQ and HW respectively). Hamza is a term used to differentiate between two types of the ‘alif’ letter, one is written “hamzated” (hence, having the orthographic symbol for hamza on the alif letter; that is HQ) and, followed by a vowel, whereas the other one is written without the hamza symbol and is indicated by a vowel; as in HW. In MSA, the difference is not only orthographic, but the behaviour of each lends a different utterance-initially or medially. Both types can be ascertained in some forms of verbs, as will be mentioned soon. However, the occurrence of HW in nouns is restricted to only a limited number of nouns (only ten which will be listed below). Let us for now give in to the idea that HW, similar to HQ, starts with a glottal stop (i.e. hamzated). The following table reveals the different behaviour of both types consistent with their position in an utterance.

Table 2.13: HW vs. HQ in MSA

HW			**HQ**		
Word	**Plus wa ‘and’**	**Gloss**	**Word**	**plus wa**	**Gloss**
/ʔɪntɪʃaːr/	/wantɪʃaːr/	diffusion	/ʔanʃʊr/	/waʔanʃʊr/	I diffuse
/ʔʊʃkʊr/	/waʃkʊr/	thank!	/ʔaʃkʊr/	/waʔaʃkʊr/	I thank
/ʔɪnkaħ/	/wankaħ/	get married!	/ʔankɪħ/	/waʔankɪħ/	cause to marry!

We can note from the table that while HW lost its glottal stop, and consequently the following vowel, in phrase-medial positions, the glottal stop in HQ is retained in the same environment. This comparison raises the question of what makes the glottal stop behave differently in almost identical environments and why the glottal stop performs in a different way from the rest of the consonants in the language. That is to say, why /wa-ʔɪntɪʃɑːr/ loses its second-word-initial consonant: /wantɪʃɑːr/ while, for example, /wa-tahæniː/ ‘and Tahani’ does not: /watahæniː/.

As mentioned previously, a native speaker would easily utter the glottal stop differently in the two situations given that the UG would sound stronger than an EG.[27] This suggests that there is a phonetic difference. Considering the morphemes that are added to the verbs, the claim that can be made here is that the glottal stop in the HQ prefix is underlying: /ʔ-/ whilst it is not in the HW and constitutes only a vowel with the option of glottal stop insertion in careful

[27] This was not taken as a proof or a claim for the difference between HW and HQ. It is only mentioned as a note. The claim would obviously benefit from an experiment to investigate the case.

speech: /v-/ with the v being any short epenthetic vowel.

For nouns, a similar case can be noticed, where both HQ and HW behave in exactly the same way as those in the verbs. For the purpose of the current study, the ones that exist in nouns are named differently from those added to the verbs. Hence, HQ and HW that are attached to nouns will be called "hamzated" and "non-hamzated "alif" respectively. The reason for this will be discussed shortly. Thus, the examples below should be considered:

Table 2.14: Hamzated vs. Non-hamzated alif in MSA

non-hamzated alif			**hamzated alif**		
Word	**Plus wa 'and'**	**Gloss**	**Word**	**plus wa**	**Gloss**
/ʔɪbn/	/wabn/	son	/ʔardˤ/	/waʔardˤ/	earth
/ʔɪmrʌʔʌh/	/wamrʌʔʌh/	woman	/ʔʊns/	/waʔuns/	amiability
/ʔalħɪsˤaːn/	/walħɪsˤaːn/	horse	/ʔamal/	/waʔamal/	hope
/ʔɪsm/	/wasm/	name	/ʔɪslæm/	/waʔɪslæm/	Islam

The main difference between the HQ and HW verbs and the hamzated and the non-hamzated alif nouns is a question of word formation. It is part of the root in nouns, while it is added at a later stage to word formation in the verbs.

The identity of both types is evident now since it is not only orthographic, as we saw from the difference in the phonological behaviour of both. In verbs, both HQ and HW are insertions that are attached to verbs to add extra meaning; hence, morphemes. While HQ is a glottal stop that is followed by an epenthetic vowel, HW, on the contrary, is a vowel that is inserted in to verbs with an optional glottal stop that is inserted to satisfy the universal preference against initial vowels. Traditional grammarians listed the cases where HW and HQ (for both nouns and verbs) occur in MSA. These are stated below:

- In ten nouns: /ɪbn/ 'son', /ɪbnah/ 'daughter', /ɪθnæn/ 'two, M', /ɪθnatæn/ 'two, F.', /ɪmrʊʔ/ 'man', /ɪmrʌʔʌ/ 'woman', /ʔɪsm/ 'name', /ɪst/ 'anus', /ɪbnɪm/ 'son', /ʔaymʊn/ 'swearing by'.
- The definite article /al/: /ʔalkɪtæb/ 'the book',/ ʔalwalad/ 'the boy', /ʔalqʌlam/ 'the pencil'.
- The imperative form I triliteral verbs: /ʔʊktʊb/ 'write!', /ʔɪqrʌʔ/ 'read!', /ʔɪmʃiː/ 'walk!' ,from /katab/, /qʌrʌʔ/ and /maʃa/.
- Form VII triliteral verbs: /ɪmtaħan/ 'to examine', /ɪnbasʌtˤ/ 'to be spread out', /ɪrtafaʕ/ 'to rise', /ɪltafat/ 'to turn round'.

- The imperative form VII triliteral verbs: /ɪmtaħɪn/!, /ɪnbʌsɪtˤ/!, [ɪrtafɪʕ/!, /ɪltafɪt/!
- The infinitive of VII triliteral verbs: /ɪmtiːħæn/, /ɪnbiːsɑːtˤ/, /ɪrtiːfæʕ/, /ɪltiːfæt/.
- The past form of the triliteral verbs: /ɪstafham/ 'sought explanation', /ɪstaktab/ 'sought writing', /ɪstarʃad/ 'sought guidance'.
- The imperative form of X triliteral verb: /ɪstafhɪm/!, /ɪstaktɪb/!, /ɪstarʃɪd/!.
- The infinitive form X triliteral verb: /ɪstɪfhæm/, /ɪstektæb/, /ɪstɪrʃæd/.

The positions where HQ occurs are listed below:

- Nouns pronouns and adjectives other than the ten nouns listed above: /ʔamal/ 'hope', /ʔɪslæm/ 'Islam' and /ʔamiːn/ 'honest', /ʔant/ 'you', /ʔana/ 'I'.
- Form I triliteral verbs: /ʔakal/' ate, M. SG.', /ʔalɪf/ 'familiarised, M. SG.', /ʔamar/ 'ordered'.
- The infinitive form of I triliteral verbs: /ʔakl/ 'eating', /ʔʊlf/ 'familiarity', /ʔʌmr/ 'order'.
- The past form of IV triliteral verbs: /ʔantaʒ/ 'produced, M. SG.', /ʔarʃad/ 'guided, M. SG.', /ʔʌqnaʕ/ 'convinced, M. SG.'.
- The imperative form of IV triliteral verbs: /ʔantɪʒ/ 'produce!', /ʔarʃɪd/ 'guide!', /ʔaqnɪʕ/ 'convince!'.
- The infinitive of form IV triliteral verb: /ʔɪntæʒ/, 'producing', /ʔɪrʃæd/ 'guiding', /ʔɪnnæʕ/ 'convincing'.
- The present tense form of I triliteral verb: /ʔarkab/ 'I ride', /ʔalʕab/ 'I play', /ʔadxʊl/ 'I enter'.

Although in the first list (regarding HW) the glottal stop is not indicated, in normal production, some kind of glottalisation can be heard. A careful native speaker's ear can tell the difference between that in /ʔʊmm/ 'mother' and that in /ʊktʊk/ 'write!' which are different. Therefore, they would state that it is weaker and less obvious in the second than in the first. Moreover it might be claimed that it is a /h/ sound rather than being a glottal stop. Such a difference between a phonemic glottal stop and a grammatical epenthetic one is also noticed in other languages. Recent phonetic analysis of non-underlying glottal stop supports this native intuition revealing a similar case for the optional epenthetic glottal stop in vowel-initial syllables in English, (Bissiri et al, 2011), in Dutch (Jongenburger and Heuven, 1991), German and Polish (Malisz et al, 2012) and many others.

Another reason for the confusion between both types in Arabic came from the fact that nowadays, the glottal stop in HQ is lost most of the time in most Arabic dialects in non-initial positions. Thus, the examples of medial HQ in Table 2.13 above would be pronounced without the glottal stop: /wʌrɪðˤ/, /wʊnʃʊr/, /wʊʃkʊr/, /wankaħ/ for the MSA phrases: /wʌ + ʔʌrðˤ/, /wʌ + ʔanʃʊr/, /wʌ + ʔaʃkʊr/, /wʌ + ʔankɪħ/, respectively.

The difference between HW and HQ is both phonological and phonetic. The basic argument, for the existence of vowel-initial syllables in ALA in this and the next chapter, is that while HW is a vowel that might surface with an optional epenthetic consonant in careful speech, HQ is a consonant that must always be attached to the onset position of an epenthetic vowel. More precisely, HW can be one of the short vowels: /a/, /ɪ/ or /ʊ/ (depending on the vowel in the stem; 'vowel harmony') that might be preceded by some kind of gesture (probably a weak form of glottal stop /ʔ/ or even a /h/ sound) in careful or intensified speech at the beginning of speech. HQ, in contrast, is a glottal stop 'ʔ' that must always be followed by one of the vowels /a/, /ɪ/, /ʊ/, /æ/, /iː/, /eː/ or /uː/. Additionally, the glottal stop that might be noticed in the pronunciation of HW speech-initially never exists in the middle of speech in MSA, whilst HQ never loses its glottal stop in normal speech.

As mentioned before, although a native ear would hear the difference between initial glottal stop and initial "glottalised" vowel, a phonological confirmation needs the support of acoustic analysis to set the difference for the dialect because, as can be concluded from the previous discussion, the behaviour of the underlying glottal stop and the epenthetic one is less problematic in Standard Arabic than in Arabic dialects.

To sum up, from the behaviour of both HQ and HW, we can now say that whilst the glottal stop in HQ is underlying, it is epenthetic in HW. Similar too many languages such as English, vowel initial syllables that might exist have some sort of optional glottalisation (Bissiri et al., ibid). Although such glottalisation might not be of complete closure, its existence is proven not to be controversial in an acoustic analysis. However, in such a language as English, where the glottal stop is not a phoneme, vowel initial syllables word-initially are not problematic, being described as onsetless. In contrast, in Arabic, such an issue is challenging with the absence of awareness of the underlying versus epenthetic glottals word-initially.

We have discussed the glottal stop in one position only; that is word-initially. In the subsequent section we will be discussing the loss of glottal stop in different positions in current Arabic dialects, by illustrating data from ALA.

2.2.2. Glottal stop loss in ALA

Similar to many other Arabic dialects, an underlying glottal stop that is indicated in all different positions in MSA is lost in various positions in ALA. The loss is considered diachronic as is discussed.

2.2.2.1. Initial glottal stop

Word-initial glottal stops are not lost in proper names such as /ʔaħmad/ ‘M.’, /ʔamæl/ ‘F.’, /ʔɪnæs/ ‘F.’, /ʔʊsæmah/ ‘M.’, and /ʔʊbajj/ ‘M.’ although such glottal stops are maintained word-initially; they are deleted in phrase-medial utterances, a thing that systematically happens on numerous occasions in connected speech in Arabic dialects. Consider ALA examples: /w-aħmɪd/ ‘and Aħmed’, /l-iːnæs/ ‘to Inaas’, /bɪnt-ʊbajj/ ‘Ubay’s daughter’. Such a process might be thought of as filling in a gap that is left after a glottal stop deletion and consequently, the glottal stop is epenthetic. The answer is that such words do not lose their glottal stops in MSA and the loss is considered diachronically provided that medial glottal stops are unpopular in Arabic dialects, as we will see below.

An underlying glottal stop is also retained in many words such as the following: /ˈʔeːmɪt/ ‘when?’, /ˈʔæmɪs/ ‘yesterday’, /ˈʔʌrɪðˤ/ ‘land’, /ˈʔahɪl/ ‘family’, and so on, and furthermore, in the personal independent pronouns /ʔaˈnæ/ ‘I’ and /ˈʔɪnta/ ‘you’, etc.

In some cases, the UG that exists in the MSA words are lost in the dialectal forms. Consider the following examples:

Table 2.15: Loss of underlying glottal stop in initial positions in ALA.

Nouns			**Triliteral verbs**		
ALA	**MSA**	**Gloss**	**ALA**	**MSA**	**Gloss**
/buː/	/ʔab/	father	/kɪˈlæ/	/ˈʔakal/	ate
/xuː/	/ʔax/	brother	/xɪˈðæ/	/ˈʔaxað/	took
/mɪˈrɑː/	/ˈʔɪmraʔʌh/	woman	/ˈlaħħɪg/	/ˈʔalħʌq/	attached
/θɪnˈteːn/	/ʔɪθnaˈtæn/	two, F.	/ˈlájjɪn/	/ʔaˈlæn/	soften
/bɑːtˤ/	/ˈʔɪbɪtˤ/	armpit	/ˈjjaθθɪθ/	/ˈʔaθθaθ/	furnished
/bɪˈriːg/	/ʔɪbˈriːq/	jug	/ˈħamma/	/ˈʔaħma/	heatened
/ˈbjʌðˤðˤ/	/ˈʔʌbjʌdˤ/	white	/ˈrʌðˤðˤʌ/	/ˈʔʌrdˤʌ/	pleased

In the following words, there is an alternation of ‘ʔ’ with a glide. Consider the following table:

Table 2.16: Initial /ʔ/ to a glide

ALA	**MSA**	**Gloss**
/weːn/	/ʔajn/	where?
/wɪˈnas/	/ʔʊns/	Amiability
/wɪˈniːs/	/ʔaˈniːs/	gregarious
/ˈwɪðɪn/	/ˈʔúðun/	Ear
/ˈjɑːxɪð/ / /ˈwɑːxɪð/	/ˈʔæxɪð/	taking, Adj.
/ˈjɑːkɪl/ / /ˈwɑːkɪl/	/ˈʔækɪl/	eating, Adj.
/wɪˈliːf/	/ʔaˈliːf/	Intimate

2.2.2.2. Word-internal glottal stop

In most instances ALA words tend to lose the internal glottal stop, similar to many other dialects. Therefore, the examples below should be considered:

Table 2.17: Vowel length for medial onset /ʔ/ in ALA

ALA	MSA	Gloss
/biːr/	/bɪʔr/	well, N.
/rɑːs/	/raʔs/	Head
/fæs/	/faʔs/	Axe
/jæs/	/jaʔs/	desperation
/rɑːj/	/raʔj/	opinion
/juːmɪn/	/joʔmɪn/	believe, 3.SG.M.
/jæsa/	/jaʔsa/	feel sorry 3.SG.M.
/luːluː/	/lʊʔlʊʔ/	pearl

In such cases, the loss of the glottal stop is repaired by compensatory lengthening to satisfy the minimal moraicity requirement, or by gemination to satisfy the restriction of vowel-initial syllables utterance internally.

Similar to Cairene Arabic (Watson, 2002:18), the UG is substituted by a glide when intervocalic between vowels of different quality, provided that the stress on the syllable preceding it and the glottal stop is in the onset of the second syllable. In the examples below, there is a gemination of the added glide to retain the stress when the two vowels are short.

Table 2.18: Medial /ʔ/ to glide in ALA

ALA	MSA	Gloss
/ˈmɪjjah/	/ˈmɪʔah/	hundred
/ˈrɪjjah/	/ˈrɪʔah/	lung
/ˈgæjɪl/	/ˈqɑːˁʔɪl/	saying, Adj.M.
/ˈsæjɪl/	/ˈsæʔɪl/	liquid
/sɪˈwɑːl/	/sʊˈʔæl/	inquiry
/mʊˈwʌggɪt/	/mʊˈʔʌqqʌt/	temporary

However, UG is retained in some initial-utterances as below.

(2.2) Retained medial glottal stop in ALA

/sɪˈʔal/ ‘asked, M.SG.’
/ˈjʔɪs/ ‘despaired, M.SG.’
/wɪˈʔad/ ‘conducted, M.SG. infanticide’

2.2.2.3. Final glottal stop

In final positions, similar to many current Arabic dialects, the glottal stop is lost.

Table 2.19: Loss of final glottal stop in ALA

ALA	MSA	Gloss
/ˈjʌgrʌ/	/ˈjʌqrʌʔ/	read
/ʃɪˈwɑːtˤiː/	/ʃaˈwɑːtˤɪʔ/	beaches
/ˈwðˤuː/ / /ˈwðˤʊw/	/wʊˈdˤuːʔ/	ablution
/soːˈdæ/	/sawˈdæʔ/	black
/ˈxɪtˤɑː/	/ˈxʌtˤaʔ/	mistake
/hɪˈnæ/	/haˈnæʔ/	bliss

2.3. Geminates in ALA

Geminates originally exist only in the coda position word initially, medially and finally although, the gemination does not appear as clear in the final positions as in the other two positions, and cannot be distinguished easily from singletons by simply listening to the word.

Geminates are of two types in ALA. One is underlying and exists in the word root and is not misplaced during concatenation. This can be either medial or final as exemplified below:

Table 2.20: Root geminates in ALA

Final	Gloss	Medial	Gloss
/ħʌgg/	rights	/xazzæn/	tank
/rʌbb/	God	/saxxɑːn/	boiler
/laff/	wrapped, 3.SG.M.	/bɪnajjah/	girl
/mɪdd/!	stretch!, 3.SG.M.	/bʌrrʌh/	out
/sˤobb/!	pour!, 3.SG.M.	/faddah/	asthma

In ALA underlying geminates are not lost in concatenating forms as the table below reveals.

Table 2.21: No degemination in root geminates in ALA

Final	**Medial**	**Gloss**
/ħʌgg/	/ħʌggah/	rights
/rʌbb/	/rʌbbiː/	God
/laff/	/laffah/	wrapped, 3.SG.M.
/mɪdd/	/mɪddah/	stretch!, 3.SG.M.
/sˤobb/	/sˤobbiː/	pour!, 3.SG.F.

Conversely, the other type is due to concatenation or word formation. The concatenation case exists temporally, as a result of syllabification either due to full assimilation (Elramli, 2012: 24 & 61-62) or to create a medial closed syllable so that the syllable receives the word’s main stress. Examples are as stated below:

Table 2.22: Gemination in ALA

Initial			**Medial**		
Word	**UF**	**Gloss**	**Word**	**UF**	**Gloss**
/ɪllɪʕbah/	/ʔɪl- + lɪʕbah/	the toy	/haddɪttah/	/haddɪd + tah/	threatened. 1.SG. him
/ɪrrabiː/	/lɪ + rabbiː/	to my God	/gʊltɪllah/	/gʊlɪt + lah/	told, 1.SG. him
/ɪmmassʌx/	/mu- + massax/	dirty	/wartɪllah/	/warrɪt + lah/	showed, 3.SG.F him
/ɪttabaʕ/	/tɪ- + tabbaʕ/	follow, 3.SG.F.	/maddɪllah/	/madd + lah/	gave, 3.SG. him

As is shown above, in the initial position, the gemination is caused by the addition of prefixes whose consonants are identical to the initial consonant of the stem. Similar to MLA, the second gemination in /haddɪttah/ is a result of full assimilation where /d/ is changed to /t/ when the t-initial agentive morpheme is suffixed.

The other case of gemination is exemplified in the words /gʊlˈtɪllah/, /warˈtɪllah/, /madˈdɪllah/, which is triggered by stress assignment as the stress shifts from the initial syllable in the verbs /ˈgʊlɪt/, /ˈwarrɪt/ and /ˈmadd/, the stress is moved to the second syllable.

The next case of gemination is in the Arabic verb formation to add a slightly different meaning to the original meaning of the verb. /kɪˈtab/ ‘wrote, M.’, /sɪˈmaʕ/ ‘heard, M.’ and /rɪˈfaʕ/ ‘lifted, M.’, for example, has the causative verb forms /katˈtab/ ‘caused to write’, /samˈmaʕ/ ‘caused to hear, and /rafˈfaʕ/ ‘caused to lift’. For the sake of limitations in space, this issue of verb formation will not be discussed further; however, the stress assignment issue and the syllabification of geminates in all its different cases will follow in Chapter

Four.[28]

2.4. Phoneme distribution in ALA

The phonemes in ALA are not restricted to a specific position in a syllable where any consonant can occur in the onset and the coda positions, word-initially, medially or finally with the specific case of the glottal stop which is discussed earlier. Thus, as we will see in Chapter Four, phonological processes such as epenthesis or syncope are not driven by the requirement of consonants position in a syllable.

The choice of what consonants occur in a consonant cluster is discussed in Chapter Three where consonant clusters in ALA appear to be mainly restricted by other factors with some restriction of consonant types. Consult Chapter Three for comprehensive discussion.

2.5. Vowels in Libyan Arabic

Despite what sets of vowels researchers agree exist in Libyan Arabic, they do not agree on the number of vowels that exist in Libyan Arabic dialects; ranging between eight (Panetta, 1943 Harrama, 1993 and Ahmed, 2008), nine (Panetta, 1940), ten (Abumdas, 1985) up to fifteen (Griffini, 1913). (Not to disregard those who agree on the number of vowels that exists in Libyan Arabic, but may not agree with what vowels placed in each researcher's list of vowels). In addition to the fact that different dialects exhibit different sets of vowels, this conflict is caused by varied arguments in relation to the source of emphasis spread that is discussed previously in this chapter and will be further considered below. In a more recent study, it is claimed that ten vowels exist in Libyan Arabic in general (Gaber, 2012: 109). Harrama (1993: 24) argues the existence of only eight vowels in the Al-Jabal dialect (JDLA) by not including the "pharyngealised" vowels /ɑ/ and /ɑː/. Conversely Owens (1984: 11) claims the existence of the vowel /o/ in words such as /moʃ/ 'not' in eastern Libyan dialects. In general, LA vowels are illustrated below.

[28] Consult Watson (2002: 139) for discussion of this type verb formation in Arabic and Ryding (2005) for comprehensive discussion of the verb in Arabic.

(2.3) Vowels in Libyan Arabic (Gaber, 2012: 109)

Vowel	Word	Gloss
/iː/	/ʕiːd/	feast
/i/[29]	/sɪlɪm/	peace
/eː/	/seːf/	sword
/a/	/katab/	he wrote
/aː/[30]	/saːs/	wall
/ɑ/[31]	/sˤɑdɑr/	chest
/ɑː/	/bɑːbɑː/	dad
/oː/	/joːm/	day
/u/[32]	/ħʊmʊr/	red, Pl.
/uː/	/sˤuːr/	fence

The vowels /o:/ and /e:/ are in fact merged as an alternative to the sequence of a vowel plus a glide j/ or /w/ which can be established in MSA; however, this sequence is lost in most current Arabic dialects with ALA not being an exception. Other Libyan examples similar to those in the table above are: /loːn/ 'colour', /koːn/ 'universe', /sˤeːf/ 'summer' and /ʕeːn/ 'eye' from MSA /lawn/, /kaʊn/, /sˤaɪf/ and /ʕajn/ respectively. In final positions, the MSA vowel-glide sequences alternate to /uː/ and /iː/: /jansuː/ 'they forget' and /tansiː/ 'you F. forget' from the underlying forms: /jansawn/ and /tansajn/, correspondingly after the loss of the final /n/ of the suffix for a grammatical reason. Such sequences exist (and scholars call them diphthongs)[33] in MSA, and while they alternate to the respective long vowels in some dialects, such as most Arabic western Libyan dialects, they are preserved in some other Arabic dialects, such as Saudi Arabian dialects. In eastern Libyan Arabic, Owens (1984:10) argues that these two sequences are confirmed in the environment only where an adjacent consonant is /h/, /ħ/ or /ʕ/: /ħawʃiː/ 'house', and in the "in-completive" verb suffixes 'ay' 'and 'aw': /taʃrɪbaj/ 'you, F. drink', /jaʃrɪbaw/ 'drink, 3.PL.' and in words such as /rawʃan/ 'window' (Mitchel, 1975).

[29]Equivalent to /ɪ/ in the current thesis.
[30]Equivalent to /æ/ in the current thesis.
[31] Equivalent to /ʌ/ in the current thesis.
[32] Equivalent to /ʊ/ in the current thesis.
[33] A name that is not favoured in this study as will be discussed in 2.6.6 below.

2.6. Vowels in ALA

2.6.1. The phonetic analysis of ALA vowels

This section is a discussion of the vowels which exist in ALA. The aim of this section is to present the occurrence of the vowels discussed below to be ready for allophonic as well as phonemic classification showing underlyingly, as well as non-underlyingly emphatic vowels. The vowel [e], is shown to be a variation of /ɪ/, as they both have been observed not to make a difference in meaning and that the choice of which is an individual preference and does not affect the meaning in any way. The proof of this claim is purely phonetic and, hence, is not further discussed in the current thesis. Therefore, the issue is an excellent material for further investigation in a future study. To limit the confusion, /ɪ/ will be used to represent the two variations in the current thesis. The vowels that exist in the dialect are exemplified in the following table.[34]

Table 2.23: Allophones in ALA

vowel	Example	Gloss
ɪ/e	[ʃed] / [ʃɪd]	hold! 3.Sg.M.
ɪˆ	[ðˤɪᵔl]	shadow
iː	[siːd]	father
iːˆ	[sˤiːᵔt]	fame
ʊ	[bʊn]	coffee beans
ʊˆ	[ħᵔʊᵔtˤtˤ]	put! 3.Sg.M.
uː	[ʕuːd]	rod
uːˆ	[ʃᵔuːᵔtˤ]	kick! 3.Sg.M.
eː	[seːf]	sword
eːˆ	[sˤeːᵔf]	summer
ʌ	[rᵔʌb]	god
o	[roʃ]	sprinkle! 3.Sg.M.
oᵔ	[xᵔoᵔtˤ]	draw a line!
oː	[doːm]	always
æ	[bæd]	annihilated
a	[zam]	carried, M.
ɑː	[nᵔɑːr]	fire

[34] Note that vowels that accompany emphatic consonants are classified as emphatics, although it will be pointed out later whether they are phonemes, or whether allophonic variation occurred. Thus, whether they are originally emphatics or they gained emphasis as a result of adjacency will not be shown in this table but will be discussed shortly.

Recall that emphasis spreads in both directions in ALA. To control the influence of the consonants spread to adjacent vowels, the coexistence of emphatic vowels and emphatic consonants are avoided and will be discussed separately.

The allophones [ɪ] and [e] occur as a variation of each other and the existence of any does not change the meaning. Thus, for example, to say [ʒɪt] or [ʒet] ‘came, 3.SG.F.’ is the same word that is used exactly in the same context. In addition, it is a fact that one is preferred more than the other in certain contexts. Nevertheless, for the reasons that have been previously mentioned it will not be discussed further in this study.

The allophones [ɪ̂], [ê], [iː̂], [ʊ̂], [uː̂], [eː̂] and [ô] coexist with emphatic consonants, and consequently emphasis spread appears to play a clear role. Emphatic vowels will be discussed shortly in the following section. For now, the set of vowels with the symbol ̂ above are considered allophones of their plain counterparts: [ɪ], [e], [iː], [ʊ], [uː], [eː], and [o] respectively.

No diphthongs exist in ALA and the sounds /eː/ and /oː/ are said to merge from the MSA sequence of /aj/ and /aw/ respectively. This will be mentioned again below.

2.6.2. The phonemic analysis of ALA vowels

To create the vowel inventory for ALA, the minimal pairs test should be used to reveal which phonemes exist in the dialect. According to the data throughout the current thesis, the following vowel phones appear in the utterances: /ɪ, iː, ʊ, uː, eː, ʌ, o, oː, æ, a, ɑː/. To investigate the distinct existence of theses vowels in ALA, the following minimal pairs test is used:

Table 2.24: Vowel Minimal Pairs in ALA

Phoneme	Example	Gloss	Phoneme	Example	Gloss
/ɪ/	/ʒɪt/	she came	/iː/	/ʒiːt/	I came
/ɪ/	/bɪn/	son of	/ʊ/	/bʊn/	coffee beans
/ɪ/	/mɪs/	touch!	/a/	/mas/	touched, 3.SG.M.
/iː/	/riːħ/	wind	/uː/	/ruːħ/	soul
/iː/	/ʕiːn/	help!	/eː/	/ʕeːn/	eye
/ʊ/	/lʊtˤ/	cauterize!	/uː/	/luːtˤ/	Proper name
/uː/	/ʕuːd/	rod	/æ/	/ʕæd/	then
/eː/	/xeːtˤ/	thread	/ʌ/	/xʌtˤ/	line
/eː/	/sˤeːf/	summer	/uː/	/sˤeːf/	wool
/ʌ/	/tˤʌb/	entered suddenly	/ɑː/	/tˤɑːb/	is cooked
/o/	/xof/	hurry up!	/oː/	/xoːf/	fear
/o/	/ħob/	love	/a/	/ħab/	grains
/oː/	/loːn/	colour	/æ/	/læn/	became soft
/oː/	/joːm/	day	/ɑː/	/jɑːm/	hey mum
/æ/	/rædd/	returning, adj.	/a/	/radd/	replied, 3.SG.M.
/æ/	/mæl/	money	/iː/	/m iːl/	bend!

In the following table, the minimal pairs test is used with focus on the two emphatic vowels that exist in ALA. Once more, as mentioned under the discussion regarding emphatic consonants and the fact of emphasis spread, only near-minimal pairs can be detected. This of course limits the certainty of the test, although is adequate for the purpose of the current study.

Table 2.25: Near-Minimal Pairs for Emphatic vowels in ALA

Phoneme	Example	Gloss	Phoneme	Example	Gloss
/ʌ/	/sʌr.ra/	cheered, 3.SG.M. him up	/a/	/sar-ra/	relieved 3.SG.M
/ɑː/	/bɑːba/	dad	/æ/	/bæba/	its door

The previous phonetic and phonemic analyses reveal that ALA has eleven vowels, which range between short and long, emphatic and plain. These features are discussed under the following sections.

2.6.2.1 simple vowels (short and long)

Similar to other Libyan dialects such as, but not exclusive to, MLA (Elramli, 2012: 15), JDLA (Harrama, 1993), TLA (Al-Ageli, 1995), whether directly or indirectly addressed-vowel length is distinctive in ALA; the case which is different from the Moroccan dialect having only four short vowels and moreover, as the vowel length is not distinctive (Harrell, 1962; Youssi, 1977; Marsil, 1988; Elhimer, 1991; Bouldlal, 2001, as cited in Bernouss, 2007: 156-157).

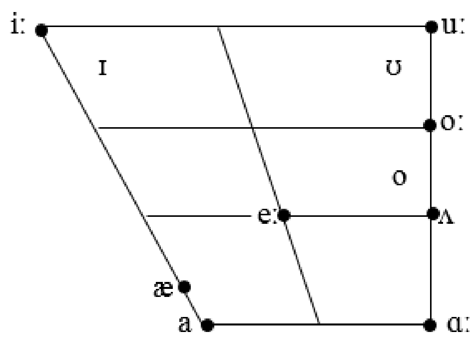
ALA has six short vowels: /ɪ, a, ʌ, ʊ, o/, and five long: /æ, iː, eː, uː, oː, ɑː/ with two emphatics and two rounded vowels[35]. The eleven vowels are as explained below:

Table 2.26: Vowels in ALA

	Front		**Central**			**Back**		
	Plain		**Plain**		**Emphatic**	**Plain**		**Emphatic**
	Short	**Long**	**Short**	**Long**	**Short**	**Short**	**Long**	**Long**
High	ɪ	iː				ʊ	uː	
Mid		eː			ʌ	o	oː	
Low		æ	a					ɑː

These vowels are shown in the following diagram:

(2.4) Vowels in ALA



These vowels are exemplified as shown in Table 2.27 below, avoiding examples that have emphatic consonants, so not to be confused with emphatic allophonic vowels that exist as a result of emphasis spread. Furthermore, only monosyllabic words are presented in order not to be mistaken for emphatic vowel spread from other syllables and for simplification reasons. Consider the following table:

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[35] Shaded cells indicate rounding in ALA.

Table 2.27: Simple vowels in ALA (long and short)

Vowel	Example	Gloss
/ɪ/	/tɪll/	pull!
/iː/	/ʒiːb/	bring!
/eː/	/ʃeːb/	greyness
/æ/	/ʃæb/	became grey-headed
/a/	/ʃabb/	alum
/ʌ/	/bʌxx/	sprayed
/ʊ/	/ʒʊrr/	pull!
/uː/	/ʕuːd/	rod
/o/	/xoʃ/	get in!
/oː/	/noːm/	sleep, N.
/ɑː/	/dɑːr/	room

The following section is a closer look at the two emphatic vowels that exist in ALA.

2.6.2.2 Emphatic vowels

Emphatic vowels are those which exist in the language with no coexistence of emphatic consonants. Thus, they are considered underlyingly emphatics. While Youssef (2006: 40) claim that there is only one emphatic "pharyngealised" vowel in Cairene, the claim that is made here is that ALA in fact has two. These are the short emphatic /ʌ/ and the long one /ɑː/. Similar to underlyingly emphatic consonants discussed under §2.1.3.1 above, emphatic vowels are capable of spreading emphasis in a similar way to that of the consonants. In doing so, both adjacent vowels and consonants could be affected. The examples below illustrate the case.

Table 2.28: Emphatic vowels in ALA

Vowel	Example	Gloss
[ʌ]	[b̂ʌr̂r̂]	land
[ɑː]	[n̂ɑːr̂]	room

As evidence of the vowel being the source of emphasis, and thus emphatic, below is a comparison between words that are optionally pronounced differently with or without vowel epenthesis in underlyingly CVCC syllables in ALA.[36]

[36]Data gained from Aurayieth (1982:24-25).

Table 2.29: The vowels as a source of emphasis in ALA

Option 1	**Option 2**	**Gloss**
[kbɪr]	[kɪb̂ʌr̂]	he grew
[rkɪb]	[rɪk̂ʌb̂]	he rode
[rbɪħ]	[rɪb̂ʌħ̂]	he gained

2.6.2.2 Allophonic vowels in ALA

Emphasis spread from underlyingly emphatic sounds (both consonants and vowels) affects adjacent consonants and vowels under the restriction concluded from the discussion under §2.1.3.2 above. The spread effect on the underlying plain consonants can be captured, to a greater extent, under phonological theory. The effect on emphasised vowels is more ambiguous and a phonetic observation needs to be conducted to detect the change. However, at this point we can argue that the pronunciation of vowels is definitely influenced and that, for example, [iː] in [tiːn] 'fig' is definitely phonetically different from that in [tˤiː̂n] 'clay'. Other vowels are changed accordingly, being influenced by adjacent underlying emphatics where vowels tend to be lower, retracted, or more centralised (Youssef, 2006: 22). To this end, we stop at this point leaving the issue to future phonetic investigation to determine the imbedded articulatory change of such vowels in such an environment.

2.6.3 Vowel change in ALA

The vowel /a/ is realised as /ə/ in unstressed syllables where final dependent singular masculine suffix or feminine marker is added but not pronounced in normal speech. In careful speech, the /a/ is attained: /ʕeːlə/ ~ /ʕeːlah/ 'family', /jiːbə/ ~ /jiːbah/ 'bring him!'

Final vowels in verbs that are underlyingly short in the standard language are lengthened in the dialect as they are stressed. Thus, /a/ is realised as /æ/, /ʌ/ as /ɑː/ and /ɪ/ as /iː/: /mɪ.ˈʃæ/ is realised as /ˈmɪ.ʃa/ 'he went'. Lengthening short vowels as they are stressed is a general rule that Aurayieth (ibid) discusses to correlate with stress assignment, where in LA, short vowels tend to lengthen when they are stressed: /ˈmuːs/ ~ /mʊ.ˈseːn/ 'two knives'. Therefore, as will be discussed in Chapter Four, such vowels, although shorter, are still extended in a phonological analysis.

Unstressed short vowels in final utterances are changed to long vowels in non-final utterances when they are stressed: /ˈjæ.buː/ ~ /jæ.ˈbuːk/ 'they brought you', /ˈguː.lɪ/ ~ /guː.ˈliːh/ 'say, F. to him', /ˈʃæ.fʊ/ ~ /ʃæ.ˈfuːlna/ 'looked, 3.PL. at us'.

2.6.4 Diphthongs

As defined in linguistics dictionaries, a diphthong "refers to a vowel where there is a single (perceptual) noticeable change in quality during a syllable, as in English *beer*, *time*, *loud*." (Crystal, 2008: 146). In Bussmann et al (1998: 316) it is defined as a "VOWEL in the articulation of which the articulators move enough so that two separate phonological phases can be distinguished". Diphthongisation is defined as a process that changes simple long vowels to variable vowels.

The existence of diphthongs in Arabic is controversial in view of the fact that those who claim that they exist in the literature; refer to the sequence 'ay' and 'aw' as explained under the previous section. Prochazka (1988: 18) for example, refers to the sequences 'ay' and 'aw' as diphthongs and claims their preservation in various Saudi Arabian dialects: /awgaf/ 'stop!' /jansawn/ '3.Pl. forget', /tansajn/ '2.SG.F. forget', and /gɑːlaw/ 'they said'.

Watson (2002: 55) explains that diphthongs in Arabic are sequences of adjacent melodic units constituted of V+Glide that attach to two rather than adjacent moras. In addition, the second part of the Arabic so called diphthong is part of the root structure of the words being attached at the melodic level as vowels are expected. Thus, the word *kayf* 'how', for example has the root /k-y-f/ and is represented in a moraic tree as shown below:

(2.5) Moraic representation of 'ay' versus 'aa' (Watson, 2002: 55)

Similar to many researchers, Youssef (2006: 2-22) refers to such sequences as diphthongs and claims that although in many cases the diphthongs are changed to long vowels in Cairene, they are reserved in others: *ʕawza* 'wanting, F.S', *layla* 'Layla, F.' and *mawguud* 'present, Adj'.

In the current study, such sequences should not be called diphthongs as they contain a consonant, and as we saw from Watson's discussion are treated as adjacent VC sequences, which should not be the case in vowels (including diphthongs). There are two types of Vowel-Glide sequences in MSA. The first is part of the root with various lengths. While initial and final glides in this type in MSA are not diachronically lost in ALA, they are lost and compensated with a vowel so that the pre-short vowel becomes long, (2.30) below.

Table 2.30: Rood glides in ALA and MSA

Position	ALA	MSA	Root	Gloss
initial	/wʌʕɪd/	/wʌʕd/	√/w-ʕ-d/	promise, N.
	/jʊmɪn/	/jʊmn/	√/j-m-n/	blessing
	/wɪriːd/	/wariːd/	√/w-r-d/	vein
medial	/loːn/	/lawn/	√/l-w-n/	colour
	/moːt/	/mawt/	√/m-w-t/	death
final	/ʕʊðˤɪw/	/ʕʊdˤw/	√/ʕ-dˤ-w/	organ
	/badɪw/	/badw/	√/b-d-w/	bedouin

The second type of Vowel-Glide sequences in MSA is morphological where adding suffixes would cause change to the end of the verb. Thus, for example the verbs /rawajt/ '1.SG. narrated', /banajnɑː/ '1.Pl. built', /raʒawt/ '1.SG. begged', /ʕafawna/ '1.SG. pardoned' derived from /rawɑː/, /banɑː/, /raʒɑː/ and /ʕafɑː/ respectively. In ALA, similar to the case exemplified in table 2.30 above, all such final Vowel-Glide sequences are similarly recognised as long vowels: /rɪweːt/, /bɪneːt/, /rɪʒeːt/, and /ʕɪfeːt/ correspondingly, with surprisingly /eː/ instead of /ɑː/ or /oː/.

Chapter 3. The Syllable Structure in Al'ain Libyan Arabic (ALA)

3.0. Introduction

There are many factors that play a role in formalising a syllable template of any language. To arrive at the syllable template of ALA, I will investigate what types of syllables are found in the dialect in all different lengths of words and the distribution of each type in multi-syllabic words. I will then examine the nature of the nucleus and what types of segments may be assigned to it. In addition, the nature of consonants and consonant clusters in the margins of the syllables needs to be investigated by scrutinising the role of sonority in ALA syllable structure and the phonotactic restrictions in the dialect by studying what possible onset/coda clusters exist in the dialect. I then determine which constituents are obligatory and which are optional. In a second step, I will investigate how two or more intervocalic consonants are syllabified. The targeted group of words will be multi-morphemic multi-syllabic words with two or three intervocalic consonants (therefore, words with the string VCCV or VCCCV underlyingly) where words such as /ʒɪtna/ 'came, 3.SG.F. to us' would be syllabified either as /ʒɪt.na/ or /ʒɪ.tna/. I will also show that /ʒɪtn.a/ is banned as it violates the Obligatory Onset Principle.

A comparison between this dialect and the capital dialect Tripolitanian Libyan Arabic (TLA) as being an influencing dialect will be discussed during the analysis where necessary. In doing so, we will shed some light on the environment around the area where the dialect under investigation is spoken. This is specifically worth examining when the influence of the dialect spoken in the capital (that is TLA) plays a role in the ALA native speakers' pronunciation. The other reason for such a comparison is that of a bedouin versus urban conflict. Other Libyan dialects will be referred to when necessary.

3.0.1. Syllable in traditional Arabic philology

While Muhammed (2009: 2), Rbaaʕ (1994: 55) and Hassaan (1990:132) all agree that MSA has an inventory of six syllable types, they disagree with regards to what these types are. Aniis (1979: 92), in contrast, reveals that there only five types that surface in Arabic. The inventories these researchers point out for MSA syllable structure are illustrated below:

Table 3.1: Syllable types in MSA

Muhammed (2009)	**Aniis (1979)**	**Rbaaʕ (1994) & Hassaan (1990)**
		VC
CV	CV	CV
CVV	CVV	CVV
CVC	CVC	CVC
CVVC	CVVC	CVVC
CVCC	CVCC	CVCC
CVVCC		

The three researchers agree that the first three types constitute the basic Arabic syllable inventory (2nd, 3rd and 4th in Rbaaʕ's and Hassan's) that is free to occur in any utterance-position; whereas occurrences of the rest are restricted.[37] Rbaaʕ (1994: 56), claims that the occurrence of CVVC can only be found in two environments (with some exceptions); in positions when a CVV.CV bi-syllabic word occurs at the end of an utterance and the last vowel is mislaid as a result of "waqf" 'pausing'. He gives an example of the hollow verb "ajwaf"[38] /qɑːla/ 'said, 3.SG.M' that is uttered as /qɑːl/ when pausing, thus having the structure CVVC. The second case that Rbaaʕ claims CVVC exist is in a non-final position where a suffix starting with an identical consonant to the final consonant of the CVVC is attached: /ʃæb-bʊn/. Thus, he did not make it apparent that the geminated consonant is due to the weight requirement to reserve the stress and that the second 'b' is not part of the added suffix, but rather is triggering it to fill in the unoccupied onset position of the suffix. Aniis, conversely, restricts this syllable type to only the end of words and of utterances in pausing "waqf" instances.

Aniis also restricts the occurrence of CVCC to only the end of words in 'waqf' cases, while Rbaaʕ follows Abu-Salim's (1987: 48-49) claim that it can also be established in the middle of short words although never in the middle of longer words. Haliili (1985:50) rejects the occurrence of this type in Arabic regardless of its occurrence within a word, claiming that a vowel either intervenes between the two consonants or posits after the last consonant.

The sixth syllable type is the most controversial. Muhammed (2009) and Omar (1979: 260) claim that it can be discovered in words that have the structure CVVC.CV in'waqf' cases:

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[37] We will see later that the occurrence of CV is more restricted than the other two core types (CVV and CVC) since it does not occur in monosyllabic words.

[38]Hollow verbs are verbs that have the middle consonant of their root either /w/ or /j/ which changes to a long vowel in the different verb forms: /qɑːl/ ~ √/q-w-l/, /bæʕ/ ~ √/b-j-ʕ/.

CVVCC. Muhammed offers as an example the word /ʤænn/ ‘goblin’ (with ‘n’ being a geminate). However, Rbaaʕ agrees with Masˤluuħ (1980), in that in the ‘waqf’ case these two syllables do not change into type-six syllable (if it is found at all). It changes to the fourth type instead (losing the gemination of the last consonant): /ʤæn/.

The most interesting syllable type, thus, is first in Rbaaʕand Hassan’s list illustrated above; that is VC. What makes it interesting is that most, if not all, modern linguists assert that Arabic syllables never start with a vowel. That is true following resyllabification. Fundamentally, VC exists in words that start with hamzatu l-wasˤli, as we saw in Chapter Two, where a line between underlying and epenthetic glottal stop is drawn. Rbaaʕ follows Hassaan (1990: 173) in considering VC as being one of the main Arabic syllable types. However, an epenthetic glottal stop (“hamza” in traditional Arabic studies) always changes this type to the CVC structure at the beginning of speech; an issue that will be argued later in this chapter. In connected speech, with the domain of syllabification being the phrase, vowel initial syllables are repaired by previous semisyllables making use of the extrasyllabicity[39] devise where peripheral constituents are exempt from structure assignment.

In conclusion, we can articulate that traditional Arabic studies of syllable structure and the syllabification process is built on model speech, poetry and the Qur’anic recitations rather than being study-based. In doing so, most of the studies were resistant to the change that occurs to the language, especially the emergence of the different dialects. Thus, the current study is an important addition to the language and dialect analysis, taking such changes into consideration and taking the spoken language as a basis of analysis.

In order to gain an understanding of the dialect under investigation, that is ALA, there is a need to look at the bigger picture by examining some other Libyan Arabic dialects with a focus on TLA as being the greater influence in most of the new generation. This is discussed under the following section.

3.0.2. Syllable structure of LA dialects

Similar to most northern African dialects, TLA syllabification reveals the tolerance of two-consonant clusters syllable-initially in the dialect. Al-Ageli (1995), for example, states that the possible syllable types in TLA have the template $C_1^2V(V)C_0^2$, with the forms recognised below:

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[39] Extrasyllabicity, a specific application of extrametricality (introduced by Liberman & Prince 1977), was introduced by Clements & Keyser (1982) to ban constituents from being assigned to syllable structures. The issue of extrasyllabicity will be discussed briefly under §4.1.3.

(3.1) TLA possible syllable inventory (Al-Ageli, 1995: 111)
(C)CV
(C)CVV(C)
(C)CVC(C)

This yields one of ten syllable forms: CV, CVC, CCV, CCVC, CVV, CVVC, CVCC, CCVVC, CCVCC and CCVV. Conversely, Elgadi (1986:56-57) goes further in arguing that initial consonant clusters might contain up to three consonants having the template $C_1^3VC_0^2$, consequently having the further syllable templates: CCCV and CCCVC in words such as /nkwa/ ‘to be cauterized’ and /ltħam/ ‘was welded, 3.SG.M’. Thus, the main difference between Al-Ageli’s and Elgadi’s schemas is the possibility of three-consonant clusters underlyingly in Elgadi’s model. Furthermore, the CCVVC and CCVV templates exist in Al-Ageli’s schema, although not in Elgadi’s.

Harrama (1993), in his study of the morphology of the Al-Jabal dialect (JDLA) points to the fact that initial consonant clusters surface as a result of phonological and morphological processes, such as vowel syncope: /kɪtæb/ → /ktæb/ ‘book’ or passive formation by adding a prefix such as ‘n-’: /n + kasar/ → /nkasar/ (/nksar/ in TLA according to Elgadi) ‘it was broken’.

In his multi-dialect study, Abumdas (1985, 88-89) mentions thirteen syllable types that can be established in various Libyan dialects, including TLA (in the North West), Zliten (in central Libya) and Benghazi (in the east). The interesting issue in Abumdas’s Libyan syllable schema is the existence of vowel-initial syllables at the phonetic level: V as in *abe* ‘he agreed’, VV as in /uː.gʊf/ ‘stand up!’, VC as in /as.wad/ ‘black’ and VVC as in /iːh/ ‘yes’.

Elgadi’s initial tri-consonantal syllable that is exemplified above is, in fact, a biconsonantal syllable that is preceded by the prefix ‘l-’ or ‘n-’ underlyingly that surface with an initial vowel as: /ɪnkwa/ and /ɪltħam/ respectively.

The review of the research undertaken reveals the following schema in relation to Libyan Arabic syllable types:

- The vowel is the only constituent to fill in the nucleus position and it can be short or long;
- No vowel-initial syllables surface in LA, except according to Abumdas;
- One consonant at least must occupy the onset (with the possibility of branching onsets of two consonants);

- Open syllables, with long and short vowels in monosyllabic as well as multisyllabic words, exist in different LA dialects;
- The coda may contain up to two consonants in monosyllabic words and in final positions in many LA dialects;
- CVVC appears to be determined only in monosyllabic or final positions; and
- In LA dialects, syllable types that have initial consonant clusters illustrate a frequent violation of the SSP, as exemplified in the above mentioned studies.

In order to examine how ALA fits into the picture of LA dialects, the coming sections investigate its syllable structure. We will shortly see that although sonority plays an important role in determining syllable constituents, it is violated when it comes to initial-consonant clusters shown in §4.5 below, the issue that proves its exceptionality in a Bedouin-like variety that prefers vowel epenthesis on consonant clusters.

The disagreement regarding vowel-initial syllables that started in Chapter Two is continued in this chapter.

3.1. Syllable types in ALA

Languages differ in what syllable types are allowed to surface. Some languages allow a wide range of syllable types with fewer restrictions on the distribution of segments, whilst others are strict in this respect in making the syllable structure obey a number of limitations. Scholars have studied all these types of limitations and consequently concluded a cross-linguistic typology. As note by Clements and Keyser (1983: 28-29), the core syllable type CV is universal. Other syllable types may be created by deletion or insertion of post-vocalic and pre-vocalic consonants according to the language parameters. For that reason, the following types are agreed to be the basic syllable types:

(3.2) Core syllable types (Clements and Keyser, 1983: 28)

a. CV
b. V
c. CVC
d. VC

The existence of these types is not universal however. All languages contain the core CV syllable template, whilst they differ in which other syllable are permitted.

In addition to these primary syllable types, languages may allow longer sequences of vowels or consonants to create a more complicated set of syllable forms. As Al-Mohanna (1994: 32) indicates, scholars who have studied Classical Arabic and Arabic dialects[40], generally agree on the presence of the following syllable types (example syllables shown in bold):

Table 3.2: Syllable types in Arabic dialects

Syllable type	**Example**	**Gloss**
CV	/**kɪ**.tæb/	book
CVC	/bʌ.**ħʌr**/	sea
CVV	/**sæ**.ʕah/	hour
CVVC	/fæ.**nuːs/**	lantern
CVCC	/**bɪnt**/	girl
CVVCC	/**ħædd/**	sharp

Furthermore, as we observed in the previous section, some dialects (such as dialects in the north west of Africa) allow syllables with initial consonant clusters. Libyan Arabic dialects such as TLA (Abumdas, 1985, Elgadi, 1986 and Al-Ajeli, 1995) and Misrata Libyan Arabic MLA (Elramli, 2012), for example, allow syllables with initial CC clusters in onset positions. Such examples are: /klæ/ (/kleː/ in TLA and MLA) ‘he ate’ and /mriːdˤ/ ‘ill’. Moroccan Arabic is another dialect that allows initial consonant clusters (Boudlal, 2001 & 2009 and Shaw et al, 2009), eg /kbaʃ/ ‘sheep, pl.’, /bkat/ ‘cries, 3.SG.F.’

Being located in the north west of Africa, ALA is similar in this respect, hence allowing initial-consonant clusters; however, these are very strictly governed as we will soon see. To investigate this phenomenon and similar ones, we need to have a closer look at the syllabification process in ALA.

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[40] See, for instance, Al-Ani (1970), McCarthy (1979b), Selkirk (1981), Abu-Salim (1982), Jarrah (1993), amongst others.

In this study, I claim that the maximal syllable in the dialect is CCVVC and as a result, the following syllable types may surface un-restrictedly: CV, CVV, CVC and CVVC with a limited occurrence of complex-onset syllables having the structures: CCVC and CCVVC mostly in monosyllabic words.

In order to establish the core lexical syllable types in ALA, we need to investigate the four syllable types that are mentioned above to analyse their occurrence in monomorphemic words, both monosyllabically as well as polysyllabically.

Although CV syllable structure is said to be the most universal syllable type, its existence in ALA is limited to polysyllabic words. The reason, as will be discussed later, is because of the requirement of bimoraicity for minimale words in Arabic dialects.

(3.3) CV in monomorphemic words in ALA

Polysyllabic	**Gloss**
/**rɪ**.mɪʃ/[41]	eyelash
/**mɪ**.diː.**na/**	city
/**mʊ.rʊ.gʌ/**	broth
/**fa**.**tˤa**.**ħa**/	flat (surface)
/**xʊ.ðˤʊ.rʌ/**	vegetables
/**wa**.**ra**.**da/**	rose

As we can notice from the list above, CV exists in polysyllabic words in any position, although it is never found in monosyllabic words either mono- or poly-morphemically.

The CVV syllable type also exists in ALA in monosyllabic in addition to polysyllabic words in initial, medial and final positions. Nevertheless, its existence in the second syllable in bisyllabic words is less frequent as will be discussed in the following section. Consider the examples below.

[41] The word /**rɪ**.mɪʃ/ has the syllable structure CVCC in MSA: /**rɪ**.mʃ/, although it is recognised as /**rɪ**.mɪʃ/ in ALA and the second /ɪ/ is not considered epenthetic in this thesis, as it does not occur as a result of a process, but instead it is adapted to the dialect.

(3.4) CVV in monomorphemic words in ALA

Monosyllabic	**Gloss**	**Polysyllabic**	**Gloss**
/læ/	no	**/sˤu**ː.rʌ/	photo
/fiː/	in	/**mæ**.**ʃi**ː/	ok
/hɑː/	what	/ħɪ.**le**ː.wa/	beautiful
/ʒæ/	came, 3.SG.M.	/mɪ.**di**ː.na/	city
/xuː/	brother	/lɪ.**hæ**/	distract
/næ/	me	/mɪ.**rɑ**ː**/**	woman

The next syllable type that is considered one of the core syllables in ALA is CVC. The following list shows its frequent occurrence in the dialect. However, its existence in monosyllabic words is limited and can only be ascertained in a few monomorphemic words, such as /mɪn/ 'who'. Its existence in poly-morphemic, monosyllabic words is less restricted though. Such examples are /ʒɪt/ 'came, 3.SG.F.' and /rɪt/ 'saw, 3.SG.F.'.[42] Examples of the frequency of CVC are described below.

(3.5) CVC in monomorphemic words in ALA

Polysyllabic	**Gloss**
/ma.sɪ.**ħah/**	axe
/**man**.**bɪt/**	seed-bed
/rʌ.**fʌʕ**/	lifting
/bʌ.**tˤɪn/**	stomach
/bɪ.**ħʌr/**	sea
/ʕɪ.**gal/**	hid, 3.SG.M.

Note here that non-final CVC mostly exists after the resyllabification of geminates in syllables, for instance CVG and CVVG in non-final positions where the syllable boundary occurs between the two consonants constituting the geminates. Such examples are: /ħæd.da/ 'sharp, F.', /mɪd.da/ 'period of time'. This is discussed in detail in Chapter Four.

The last syllable type in our list is CVVC. This is also examined in the monomorphemic words below.

[42]As we will see later, monosyllabic CVC is usually changed to CVG to satisfy the minimal moraicity principle.

(3.6) CVVC in monomorphemic words in ALA

Monosyllabic	**Gloss**	**Polysyllabic**	**Gloss**
/fæt/	passed, 3.SG.M.	/ʒɪ.**diː****d**/	new
/ʕeːn/	eye	/bɪ.**rɑː****d**/	chilly
/riːd/	beloved, N.	/mɪ.zɪ.**mɑː****r/**	flute
/læʃ/	why	/mɪ.**liː****ħ**/	nice
/nuːr/	light	/ma.gʊ.**ruː****n/**	shotgun

CVVC does not subsist in initial as well as medial positions in ALA, although a claim can be made that it exists underlyingly and is subject to resyllabification after vowel epenthesis, but it does not surface in these two positions. This will be discussed later.

To summarise, the syllable types discussed above exist in ALA with no resyllabification processes. That is to say, CV, CVV, CVC and CVVC constitute the dialect's syllable algorithm. Syllable types are not restricted to this set however and more syllable types exist in the dialect. Those are, although created for some reason or another also extensively used. The discussion below shows the circumstances where they exist and their distribution and use in the dialect. Chapter Four is a thorough discussion of the syllabification process in ALA. However, some more syllable types exist in the dialect. These are discussed below.

The most controversial syllable type that is claimed to exist in this dialect is that which begins with a vowel; that is a VC syllable type. As mentioned before, many linguists do not believe that Arabic exhibits syllables that start with a vowel. In fact, it is beyond the scope of the current thesis to verify the case in MSA as well as other Arabic dialects[43]. However, the current study claims that similar to many other world languages, ALA does exhibit vowel-initial syllables. The reason for this controversy with regards to its existence is as suggested previously in the previous chapter because of the confusion with the glottal-stop insertion versus the underlying glottal stop. This syllable type has a grammatical function and exists as a result of word formation. Its existence in monosyllabic words is thus rare and limited to a small number of nouns as referred to in the previous chapter. This is another reason for not recognising the similarity between the vowel-initial syllables in ALA and in other world languages, where the existence of vowel-initial syllables is not restricted to a certain function

[43] Bearing in mind the fact of MSA glottal-stop loss in many cases in nowadays Arabic dialects as discussed under 2.2.2.

as it does in Arabic, where it serves a grammatical function. Those vowel-initial syllables are said to surface with an optional epenthesised glottal stop (HW). Hence, the examples below should be considered.

(3.7) VC in ALA

Polysyllabic	**Gloss**
/**ɪm**.tɪħæn/	exam
/**ar**.kaħ/	stop moving!
/**ʊs**.kʊt/	stop talking!
/**ɪʒ**.riː/	run!
/**ɪm**.mɑː.ʕiːn/	utensils
/**ɪr**.tɪ.batˤ/	is linked to
/**ɪs**.tɪm.tæʕ/	enjoying
/**ɪn**.kɪ.tab/	is written
/**ɪl**.tɪ.ħam/	is welded
/**ʊr**.ruːsˤ/	the heads
/**ɪr**.rɪ.biːʕ/	the spring
/**ɪr**.giːg/	thin
/**ɪx**.mɪr/	rotted
/**ɪh**.bæl/	craziness

As the list above indicates, vowel-initial syllables exist only in bi- and polysyllabic words. It does not exist in medial positions as this would trigger resyllabification as we will see in Chapter Four.

Moreover, some instances of vowel-initial syllables that exist in the dialect are morphologically complex and are subject to phonological repairs in non-initial utterances. These are very restricted and can only be ascertained in verb (and related word) formation prefixes in ALA, for instance those discussed in Chapter Two under the epenthetic glottal-stop section for MSA. Vowel-initial syllables are comprehensively discussed under §3.4 underneath.

The syllables CVG and CVVG[44] also exist in the dialect, consequently showing syllables ending with geminates (G) either permanent or temporary. Consider the data for complex syllable-types below.

(3.8) Complex syllable types in ALA[45]

a) CVG in ALA

Monosyllabic	**Gloss**
/had/	broke through, 3.SG.M.
/ħadd/	edge
/ħaʒʒ/	went on pilgrimage, 3.SG.M.

b) CVVG in ALA

Monosyllabic	**Gloss**
/ħædd/	sharp
/ħæʒʒ/	pilgrim
/xɑːtˤtˤ/	making a line

In fact, CVG is the minimal monosyllabic, monomorphemic word that exists in the dialect. Neither CV nor CVC exist in monosyllabic isolated words and their existence is usually subject to vowel lengthening in CV and the gemination of the final C in CVC; subsequently, we have the minimal monosyllabic words CVV and CVG respectively.

CVG and CVVG are subject to resyllabification in non-final positions where G is claimed to be heterosyllabic. Consider the discussion under §3.2 where Table 3.10 presents examples of CVG syllable structure. Examples for CVVG in medial positions are: /ʒæddah/ 'serious, F.', /rɑːdah/ 'returning, 3.SG.M it' and /ʃeːtta/ 'cleaver'.

Moreover, syllables with complex onsets, such as CCVC and CCVVC may also occur in the dialect but in a restricted number of environments. These two syllable structures that have initial consonants are noticed in ALA. Examples are as demonstrated below.

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44 G stands for geminate.

45 Gemination tends to be softer in longer words. Whether it is completely lost or still exists needs more investigation. It will not be discussed further in the current thesis.

(3.9) CCVC and CCVVC in ALA

CCVC	Gloss	CCVVC	Gloss
/kθɪr/	increased	/ħmɑːr/	donkey
/grɪb/	water bottle	/hbæl/[46]	craziness
/bjʊðˤ/	became white	/ktæf/	shoulders

Generally speaking, consonant clusters are not favoured in this dialect. However, initial complex onsets exist in restricted environments. This is thoroughly discussed under §3.5.

In contrast, in careful or emphasised speech, a pre-consonantal vowel may be added and this would cause resyllabification by placing the syllable boundary between the two consonants where the initial consonant of the cluster is syllabified as a coda consonant to the added vowel. Additionally, an optional glottal stop may be heard. Consider:

(3.10) Optional resyllabification of onset clusters in careful speech in ALA

/xmɪr/ → /(ʔ)ɪx.mɪr/ 'rotted'
/sbɪl/ → /(ʔ)ɪs.bɪl/ 'excuses'
/rkɑːb/ → /(ʔ)ɪr.kɑːb/ 'knees'

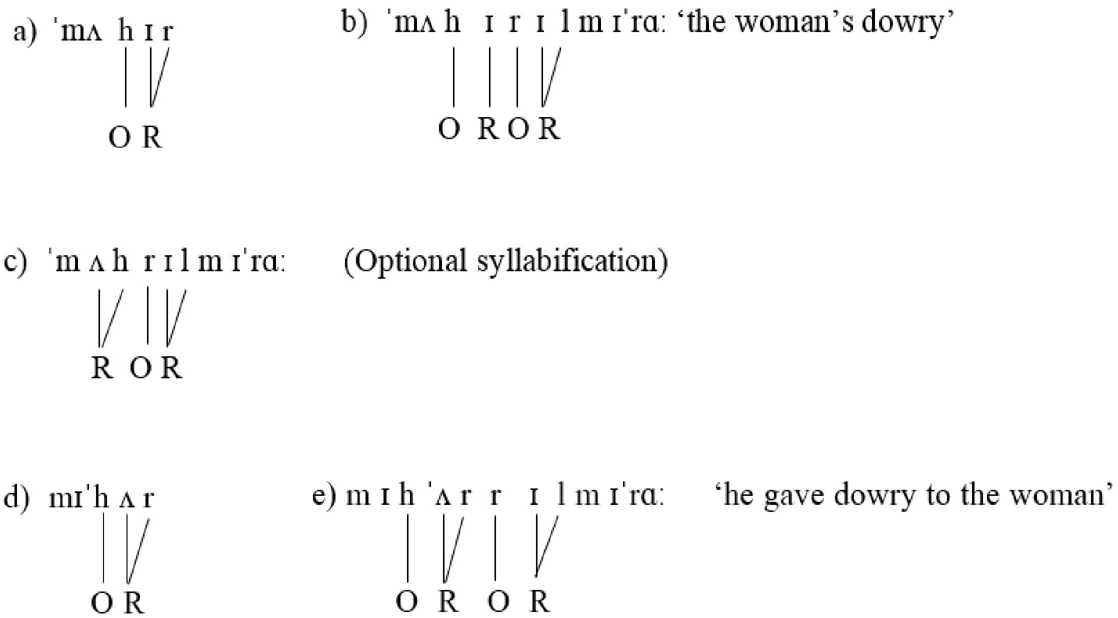
CVCC is a syllable with its coda being occupied by a cluster of two consonants. Although its existence in MSA is influential in many cases, the current study confirms that it is not underlyingly in existence and that the optionality of the appearance of it in some cases does not indicate that CVCC is one of the syllables that should be in the dialect syllable-algorithm.

As mentioned in the previous section, consonant clusters in the coda position do not appear in ALA, either lexically or postlexically. Evidence comes from the recognition of the nominal structure CVCC in MSA as having the structure CVCVC instead in ALA. Thus, for example, the Standard Arabic underlying form /mʌhr/ surfaces as /ˈmʌ.hɪr/ 'dowry' in ALA with the /r/ occupying the coda position in both the isolated and utterance-internally in (a) and (b) below. The pronunciation /ˈmʌhr/ with /r/ occupying the onset position postlexically is optional in ALA and can be heard more amongst the younger generations. In this optional case, /h/ and /r/ are hetero- rather than tautosyllabic consonants with the /h/ occupying the coda of /mʌh/ and /r/ occupying the onset of /rɪl/ in (c) below. Its structure is compared to the structure in the verb /mɪ.ˈhʌr/ 'gave dowry to' which has a temporary gemination that shows up as a

[46] Optionally uttered with an initial vowel, as observed before.

requirement of stress un-shifting. Isolated and utterance internal cases for the verb are illustrated in (d) and (e).

(3.11) syllabification of /mʌhr/ amd /mɪ.ˈhʌr/ in ALA



As referred to above, the last consonant of the stem in (e) is geminated. This gemination is a temporary constituent that emerges to indicate the heaviness of the syllable to consequently receive the main stress. Evidence of the geminate being temporary is clear when the word is attached to a consonant-initial morpheme that blocks vowel epenthesis such as in: /mɪhˈʌrha/ ‘her dowry’ where ‘r’ and ‘h’ relate to different syllables. When such a word is followed by a vowel-initial morpheme or word, the final consonant is geminated to satisfy the universal requirement for no-empty onsets, whilst keeping the heaviness of the stressed syllable at the same time. Thus, the first part of the geminate ‘r’ occupies the coda of the stressed syllable /hˈʌr/, whilst the second part of the geminate occupies the onset position of the following syllable, as explained in the verbal column in 3.3 below with detailed discussion to follow in the following chapter. The table underneath reveals how MSA's CVCC structures appear in ALA indicating that it is not a case of epenthesis.

Table 3.3: Syllabification of MSA's CVCC, phrase internally in ALA

Nominal			**Verbal**		
Lexical	**Poslexical**	**Gloss**	**Lexical**	**Postlexical**	**Gloss**
/ˈmʌrɪðˤ/[47]	/ˈmʌrɪðˤɪrrɑːʒɪl/	the man's illness	/mɪˈrʌðˤðˤ/	/mɪˈrʌðˤðˤɪrrɑːʒɪl/	The man got ill
/ˈfataħ/	/ˈfatɪħɪlbæb/	the opening of the door	/fɪˈtaħħ/	/fɪˈtaħħɪlbæb/	he opened the door
/ˈlaʒɪm/	/ˈlaʒɪmɪlħɪsˤɑːn/	curbing the horse	/lɪˈʒamm/	/lɪˈʒammɪlħɪsˤɑːn/	he curbed the horse

As previously mentioned, the loss of the vowel in phrase-internal positions is optional. Therefore, the utterances in the second column in Table 3.3 above can also be optionally uttered as: /ˈmʌrðˤɪrrɑːʒɪl/, /ˈfatħɪlbæb/, /ˈlaʒmɪlħɪsˤɑːn/, respectively. The case of optionality is not reflective of the dialect syllabification; therefore, it will not be indicated in the table and will not be discussed further.

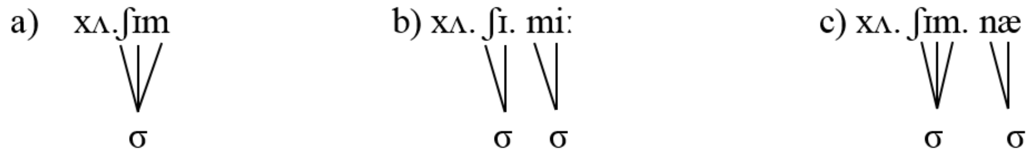
A similar case can be seen in dependant pronouns attachment. Consider the examples below:
Table 3.4: Syllabification of (underlying CVCC + dependent pronouns) in ALA

Final CVCvC	**+ -V(C)**	**Gloss**	**+ -CV**	**Gloss**
/xʌ.ʃɪm/	/xʌ.ʃɪ.mɪ/	my nose	/xa.ʃɪm.na/	our nose
/sˤʌ.bɪr/	/sˤa.bɪ.rah/	his patience	/sˤa.bɪr.na/	our patience
/ga.lɪb/	/gʌ.lɪ.bak/	your, SG. heart	/ga.lɪb.hum/	their heart
/ʕʊ.mʊr/	/ʕʊm.reːn/	two ages	/ʕʊ.mʊr.kʊm/	your, P. age

As expected, the attachment of consonant-initial morphemes (-CV) keeps the stems' syllabification. Surprisingly (compared to MSA and other Arabic, and even Libyan dialects), the same syllabification is maintained after a vowel-initial morpheme is added. In such a case where the stem's vowel is expected to be misplaced when a vowel-initial pronoun is attached, the words are expected to surface as /xʌʃ.mɪ/, /sˤʌb.rʌk/, /gal.bɪ/, /ʕʊm.reːn/. The representation of the three cases is as revealed in the figure below:

[47] With the choice of pronouncing it with the second syllable stressed and its consonant geminated so that it has the same pronunciation and phonological behaviour as the verb derived from it /mɪˈrʌðˤðˤ/.

(3.12) Syllabification of MSA’s CVCC in three different situations in ALA; representation of /xʌ.ʃɪm/



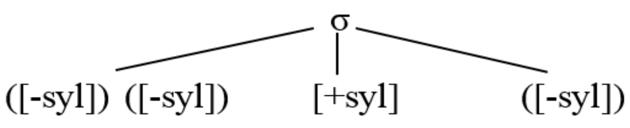
To conclude this part, no CVCC syllables exist in ALA. Those which are so in MSA and other Arabic in addition to Libyan dialects are recognised as two successive syllables: CVCVC. The case is not considered epenthesis as there is no trigger in monomorphemic words. In polymorphemic words, the second vowel in CVCVC is usually reserved, although its loss can be detected as an optional process.[48]

To sum up, the following parameters formulate the syllable inventory in ALA and will be discussed in detail in the following sections.

- Only vowels occupy the nucleus position;
- The onset is obligatory utterance-medially;
- Vowel-initial syllables are possible but restricted to only one environment;
- Two-consonant clusters in onset exist in only a few types of words as a result of vowel syncope in non-concatenated words and block of epenthesis in some prefixed words;
- No consonant clusters are allowed to surface in the coda in the final as well as non-final position in mono- as well as multi-syllables lexically or post-lexically;[49]
- Complex codas having geminates occur only word-finally as syllable-medial geminates subject to resyllabification of the two parts of the geminate;
- The coda is optional.

The syllable template below summarises the above mentioned parameters.

(3.13) ALA Syllable template



[48] The different behaviour of for example /galɪb/ ‘heart’ and /bɪħar/ ‘sea’ will be discussed later under the resyllabification processes.

[49] Although, as we will see later, borrowed words from MSA with the structure CVCC are occasionally detected in the dialect in educated speakers’ speech.

Below is a list of the syllable types that exist in ALA.

Table 3.5: Syllable types in ALA

Syllable type	**Lexical**		**Derived**	
	Example	**Gloss**	**Example**	**Gloss**
CV	/**fɪ**.næ/	extinction	/mak.**tɪ**.**bɪ**.tː/	my library
CVC	/ma.**saħ**/	sweeping	/**mɪn.**huː/	who is it?
CVV	/**si**ː**d**/	lord	/**fi**ː.næ/	into us
CVVC	/**ʃo**ː**tˤ**/	football game	/ɪs.**be**ː**z**.tah/	his grocery
VC	/**ɪn**.ta/	you, SG.M	/**ɪs**.mɪʕ.lah/	listen, SG.M to him
CVG	/**ʒɪdd**/	grandfather	--	--
CVVG	/**sˤa**ː**bb/**	is pouring	--	--

In general, ALA is a dialect that prefers CVCV sequences whenever possible. This can be noted in many cases of epenthesis at syllable boundaries where a vowel is inserted between two heterosyllabic consonants in words such as /ma.dɪ.xɪl/ (from /mad.xɪl/) ‘entrance’, /tɪ.kɪ.tɪb/ (from /tɪk.tɪb/) ‘write, 3.SG.F.’ and /sˤʊ.fʊ.ra/ (from /sˤʊf.ra/) ‘tray’. Epenthesis and its motivations will be thoroughly discussed in the next chapter.

We can see from the data discussed throughout the chapter that only vowels, whether short or long, occupy the nucleus position. No other segments can be assigned to this position.

The onset is another obligatory constituent in ALA syllable structure in medial positions. Hence, in a string as VCV the medial consonant is assigned as the onset of the second syllable. This tendency towards no vowel-initial syllables utterance-medially is noticed universally so as to satisfy the Onset Principle. Utterance-initially, vowel-initial syllables may exist as we saw above.

Intervocalic sequences of consonants are maximally CC with the first consonant occupying the coda of the previous syllable and the second consonant occupying the onset. Thus, no internal consonant clusters exist in the dialect and any word-internal CC must be syllabified as adjacent rather than as a cluster. The reason for this is because initial consonant clusters are not driven by the sonority principle. They have a morphological and a structural restriction instead, as we will identify later.

ALA is one of these dialects that generally follow the universal tendency that onset nodes prefer to be occupied by single consonants (Kuryłowicz 1948; Steriade 1982; Clements and

Keyser 1983, Itô 1989, among others). Therefore, the underlying complex forms /staʕmɪl/ ‘use! Imp.’, /rtɪbatˤ/ ‘is engaged’, for example, surface with presyllable vowel insertion: /(ʔ)ɪstaʕmɪl/ and /(ʔ)ɪrtɪbʌtˤ/ correspondingly. However, complex onsets in non-complex words do exist in the dialect as the emergence of consonant clusters is a result of vowel syncope in some word forms, for instance /grɪb/ ‘came closer’, /xlæl/ ‘safety pin’, and /bdɪl/ ‘suits N.’. Postlexically, utterance-initial complex onsets surface as a result of blocking vowel epenthesis when a prefix is added: /nħɪn/ ‘crave, 1.SG’, /jðuːb/ ‘melt, 3.SG.M.’. These will be discussed under §4.5.

3.2. Distribution of syllable types in ALA

It should be noted at this stage that CV is unrestricted. It can occur word-initially, medially or finally. Examples from ALA are revealed in Table 3.6 below.

Table 3.6: Distribution of CV in ALA

Initial CV		**Medial CV**		**Final CV**	
Word	**Gloss**	**Word**	**Gloss**	**Word**	**Gloss**
/**mɪ**.nuː/	who?	/ma.**ʒɪ**.ra/	path	/ma.rɪ.**sa**/	anchorage
/**ʔa**.næ/	me	/tɪ.**ʕɪ**.ʒɪn/	knead, 3.SG.F.	/moː.**ta**/	dead, N,.Pl.
/**bɪ**.sˤɑː.rah/	kidding	/wa.**rɪ**.dah/	rose	/ʕoː.**ʒa**/	crooked

As we saw from the table above, CV never stands on its own in ALA. Though, its position in polysyllabic words is not restricted, and as aforementioned, it freely occurs word-initially, medially or finally. More examples are: /**nɪ**.zal/ ‘descended, 3.SG.M.’, /jɪ.**gɪ**.lɪb/ ‘turn over, 3.SG.M.’ and /an.**sa**/! ‘forget! Imp.’. As we will notice later, the vowel in the medial syllables of a word such as /jɪ**gɪ**lɪb/ is epenthetic and takes place between two syllables. From the ALA data that is discussed throughout the thesis we can state that all the cases in relation to medial CV are a result of epenthesis. This kind of epenthesis and its motivator will be discussed elaborately in the following chapter under epenthesis.

Although CVC exists in any position in ALA, in some cases it usually undergoes re-syllabification so that it surfaces as CVCV by applying vowel epenthesis when the following syllable starts with a consonant. Consider the examples in the table below.

Table 3.7: Resyllabification of CVC

Initial CVC			**Medial CVC**		
Word	**US**	**Gloss**	**Word**	**US**	**Gloss**
/tɪ.ʒɪ.riː/	/tɪʒ.riː/	running, 3.SG.F.	/mɪ.za.rɪ.kɪʃ/	/mɪ.zar.kɪʃ/	is mottled
/ma.bɪ.rɪd/	/mab.rɪd/	knife sharpener	/mɪ.ka.rɪ.mɪʃ/	/mɪ.kar.mɪʃ/	is crimped
/lʊ.gʊ.mah/	/lʊg.mah/	mouthful	/jɪ.tɪ.ma.rɪ.mɪd/	/jɪt.mar.mɪd/	is messed up
/ʒɪ.bɪ.nah/	/ʒɪb.nah/	cheese	/jɪt.hat.rɪʃ/	/jɪt.hat.rɪʃ/	crumbles, 3.SG.M.

We observe in the previous table that vowel epenthesis applies between heterosyllabic consonants; hence, CVC is resyllabified as CV.CV in such cases. This is not always the case and we cannot say that the existence of CVC is banned in such positions in ALA for the reason that in some cases the syllable type non-problematically surface. Such examples of the existence of CVC in initial and medial positions in ALA are shown below.

Table 3.8: CVC word-initially and medially

Initial CVC		**Medial CVC**	
Word	**Gloss**	**Word**	**Gloss**
/ʒɪt.hʊm/	came, 3.SG.F. to them	/mɪ.lax.tiː/	put off, 2.SG.F. your clothes
/mɪt.na/	died 1.PL.	/nɪ.zal.tiː/	got off, 2.SG.F.
/ʒɪʕ.na/	became, 1.PL. hungry	/wɪ.gaf.tiː/	stood, 2.SG.F.
/rɪt.kʊm/	saw, 3.SG.F. you, Pl.	/sɪ.mɪ.ʕɪt.niː/	heard, 3.SG.F. me
/tˤan.jɪ.rah/	cooking pan	/ħɪ.laf.la/	swore, 3.SG.M. to him
/kʊn.dɪ.rah/	Shoes	/tˤɪ.rab.la/	enjoyed, 3.SG.M. listening to him
/mɪsˤ.tˤɪ.rah/	a ruler	/ʔɪ.xɪn.bɪ/	rob, 2.SG.F.IMP!
/mad.rɪ.sah/	School	/tɪ.ðab.ðɪb/	vibrate, 3.SG.M.
/maz.rɪ.ʕah/	Farm	/tɪ.ʃar.taʕ/	spread, 3.SG.M.

In addition to the above cases, CVC also exists in cases of metathesis, such as those described in the table below.

Table 3.9: Metathesis and CVC syllables in ALA

Word	UR	Gloss
/ʔa.rɪf.ʕɪ/	/ʔar.fa.ʕɪ/	take with you! F. IMP.
/ʔa.mɪs.ħɪ/	/ʔam.sa.ħɪ/	swipe!, F. IMP.
/ja.ʒɪ.raħ/	/jɪʒ.raħ/	to gash

A clear case where CVC exists with no resyllabification is at the last C, being part of a geminate. In addition to the monosyllabic CVG syllable, geminates also occur in polysyllabic words such as the examples shown in Table 3.10 below.

Table 3.10: CVG word-initially, medially and finally

monosyllabic and initial		**Medial**		**Final**	
Word	**Gloss**	**Word**	**Gloss**	**Word**	**Gloss**
/ħɪʒʒ/	pilgrimage	/tɪ.raðˤ.ðˤɪ/	gratify	/mɪm.tadd/	spread
/madd/	handed, 3.SG.M.	/j.daj.ja/	my hands	/muʕ.tazz/	proud
/ʕɪdd/	count!, IMP.M.	/ʕɪd.dɪ/	count! Imp. F.	/bɪ.tˤugg/	will nock, 3.SG.M
/lamm/	collected, 3.SG.M.	/tɪ.ħad.dɪ/	challenge	/bɪn.dɪss/	will hide, 1.SG.
/mann/	honeydew	/tˤɑː.gɪj.ja(h)/	hat	mɪl.tamm/	is gathered

In such examples, geminates are heterosyllabic; therefore, they are split between two syllables where the first part of the geminate occupies the coda position of the syllable on the left, whereas the second part occupies the onset position of the following syllable. This can be easily seen in the examples above where the geminate is not final. In final positions, geminates are syllabified as tautosyllabic having its own mora besides sharing the preceding vowel's mora as we will see under §4.2.3.

In final positions, CVC occurs frequently although we will be claiming later that this final C is resyllabifyable depending on the following utterance. The table below explains instances of resyllabification of underlying CVC (and CCVC).

Table 3.11: Final CVC in ALA

Final CVC			
Bisyllabic		**Longer words**	
Word	**Gloss**	**Word**	**Gloss**
/nɪ.gaz/	jumped, 3.SG.M.	/ma.sˤɪ.nʌʕ/	factory
/lɪ.bas/	got dressed, 3.SG.M.	/ma.ħɪ.fɪl/	congregation
/mɪ.rʌðˤ/	illness	/sæ.ʕah/	watch, N
/ʒa.bɪd/	pulling	/tɪ.jak.kɪd/	checked, 3.SG.F.
/ʒɪ.bad/	pulled, 3.SG.M.	/mɪ.xʌr.rɪb/	damaged
/gʌ.bɪr/	grave	/mɪ.raw.wʌħ/	going home, 3.SG.M
/gɪ.bar/	buried, 3.SG.M.	/ma.rɪ.jɪm/	Mariam
/ħɪ.sɪd/	envy, N.	/ħɪ.dæ.jɪd/	bracelets

Being an open syllable, CVV seems to be unrestricted regarding its distribution within an utterance, either in initial or in medial positions. In final positions, its occurrence is less frequent as it occurs word-finally only in bi-syllabic words in this dialect and receives the main stress in this instance. Also, there is a tendency to reduce long vowels in final positions. Consider the examples in the following table.

Table 3.12: Distribution of CVV in ALA

Initial CVV		**Medial CVV**		**Final CVV**	
Word	**Gloss**	**Word**	**Gloss**	**Word**	**Gloss**
/sæ.lɪm/	a proper name	/tˤɪ.rɑː.liː/	happened to me	/nɪ.ʒæ/	survived, 3.SG.m.
/næ.dɪr/	Rare	/bɪ.dæ.liː/	suits, N.	/sˤɪ.fɑː/	purified, 3.SG.M.
/ruː.ħiː/	my soul	/tɪ.rɪ.kiː.nah/	corner	/ʕɪ.liː/	Ali
/liː.na/	Ours	/ma.rɪ.buː.ʕah/	guests' room	/θɪ.riː/	rich

CVV also exists as a result of resyllabification of CVVC in morphologically complex words. Consider: /bæbɪha/: /bæb/ + /ha/ 'its door'; /ædah/: from /zæd/ + /h/ 'added, 3.SG.M. it'; /mɪʃeːtɪlha/: from /mɪʃeːt/ + /laha/ 'went, 1.SG. to her', /ðˤɪruːfiː/ from /ðˤɪruːf/ + /iː/ 'my circumstances'.

CVVC exists in monosyllabic words as mentioned in (3.6) above and also word-finally. It never occurs in medial positions and its occurrence in non-final positions triggers resyllabification and the final C is syllabified as the onset of an epenthesised vowel (if the following syllable already has an onset) or by occupying the onset of the following vowel-initial morpheme. The distribution of CVVC is exemplified in the table below.

Table 3.13: Distribution of CVVC in ALA

monosyllabic CVVC		final CVVC	
Word	**Gloss**	**Word**	**Gloss**
/bæt/	spent, 3.SG.M. the night	/kɪ.tæb/	book
/liːk/	Yours	/mɪ.liːħ/	nice
/ʕeːn/	eye	/gɪ.reːt/	I read (past)
/ʒuːd/	generosity	/bɑː.buːr/	engine

In a moraic theoretical analysis, CVVC is a superheavy syllable with three moras. To satisfy a requirement that ALA, similar to other Arabic dialects, is maximally bi-moraic as we will see later, a resyllabification of the final C as an onset would result in losing its mora. Therefore, one of two processes occurs for this sake. In one of them, the consonant is resyllabified with an epenthetic vowel when the following morpheme starts with a consonant. In the other case, the C occupies the empty onset position of the attached vowel-initial suffix. Further examples to those mentioned previously in the discussion regarding CVV syllable type are as shown below.

Table 3.14: Non-final CVVC in ALA

CVVC + suffix	Syllabification	Gloss
/ʒiːt + kʊm/	/ʒiː.tɪ.kʊm/	came, 1.SG. to you, PL.
/kɪ.leːt + hʊm/	/kɪ.lɪː.tɪ.hum/	ate, 1.SG. them
/rɑːs + ha/	/rɑː.sɪ.ha/	her head
/ħoːsh + na/	/ħoː.ʃɪ.na/	our house
/reːt + ah/	/reː.tah/	saw, 1.SG. him
/mɪn.ʃɑːr + iː/	mɪn.ʃɑː.riː/	my saw

Although the long vowel is phonetically shorter in forms such /bæbeːn/ ‘two doors’, /nɑːreːn/ ‘two fires’ /ʕiːdeːn/ ‘two feasts’ CVVC + /eːn/, but are still considered long phonologically. Thus, there is no claim that can be made for the shortening of long vowels in such a case in ALA. Consequently, the vowel-length difference between /bæb/ and /bæbeːn/ will not be discussed further in the current study.

3.3. Sonority in ALA

While scholars agree on the Universal Sonority hierarchy in general, they agree that languages differ in the extent to which they obey the universal sonority hierarchy and hence have their own language-specific sonority hierarchy. There is also an agreement that violations of sonority hierarchy can be attributed to the occurrence of vowel syncope (Al-Mozainy, 1981: 199), a case which occurs systematically when consonant clusters arise in the dialect, as a result of vowel syncope in morphologically simplex words and by epenthesis blocking in morphologically complex words word-initially, as we will notice later.

3.3.1. The internal sonority hierarchy structure in ALA

The ranking of segments that will be used for ALA follows the universal ranking. Here I follow the universal hierarchy, which is presented in a number of previous literatures, specifically discussed in Clements (1990); hence, having the structure noted below in (3.14):

(3.14) ALA Sonority hierarchy

Vowels	more sonorous
Glides	
Liquids	
Nasal	
Obstruents	less sonorous

The sonority distance will be considered equal within the glides, liquids and nasals for the purpose of the current study, seeing that the distance would not be high and the exact number of the distance does not have a significant effect on the phonology of the dialect. Classification is only made between the different class categories and within obstruents as this class feature contains the biggest number of segments. This implies that the distance between segments under obstruents is varied and is significant. Thus, a classification within these will be beneficial to the current study, where the role of sonority is investigated to see what consonant clusters may exist in this dialect and whether epenthesis is a repair process triggered by the sonority hierarchy. The obstruents' sonority hierarchy assumed here is that discussed by Parker and illustrated in (3.15).

(3.15) Parker's Sonority Hierarchy of obstruents (2008: 58)

Voiced fricatives	more sonorous
Voiced affricates	
Voiced stops	
Voiceless fricatives	
Voiceless affricates	
Voiceless stops	less sonorous

Hence, the sonority hierarchy that will be assumed for ALA is as shown below.

(3.16) ALA Sonority hierarchy of obstruents

Vowels: ɪ, iː, ʊ, uː, eː, ʌ, o, oː, æ, a, ɑː more sonorous
Glides: j, w
Liquids: l, r
Nasal: m, n
Obstruents:
Voiced fricatives:ð,z,ɣ,ʕ,ðˤ
Voiced stops:b,d,g, ʔ
Voiceless fricatives:f, θ,s, ʃ, ʒ, x, ħ, h, f, sˤ
Voiceless stops: t,k,tˤ less sonorous

Parker's hierarchy is based on the universal tendency in which voiceless segments are ranked lower, in terms of their sonority, than their voiced counterparts. This tendency is confirmed in different acoustic analyses of individual languages. Jany et al. (2007) conducted an experiment where Egyptian Arabic, amongst other languages (Hindi, Mongolian and Malayalam), was acoustically investigated. They showed that voiceless obstruents are less sonorous than their voiced counterparts as described in 3.17 beneath, where < shows that the ones on the left are ranked lower than those on the right.

(3.17) Sonority hierarchy within class features in Egyptian Arabic

(Jany et al., 2007: 1402)
Voiceless fricatives < voiced fricatives
Voiceless sibilants < voiced sibilants
Voiceless stops < voiced stops
Rhotics < laterals
Other fricatives< sibilants

They concluded that the universal sonority hierarchy is maintained in most of the languages under investigation. That is, most languages follow the hierarchy: glides > liquids > nasals > obstruents, with Egyptian Arabic having a slightly different ranking regarding nasals and glides, as described below in (3.18) compared to the Universal Sonority Hierarchy.

(3.18) Sonority of segments in coda position in Egyptian Arabic (Jany et al, ibid)

Laterals > nasals > glides > rhotics > affricates > sibilants > fricatives (excluding sibilants) > stops

3.3.2. The role of sonority in ALA syllabification

There is no doubt that the sonority hierarchy plays a universal role in the process of syllabification in determining the syllable constituents' arrangements. In ALA, only vowels, which are the highest in the sonority hierarchy, occupy the peak of the syllable. Less sonorant segments are arranged around the peak. Generally speaking, no consonant clusters are favoured in the dialect although, as we will see later, syllable-initial clusters can surface as a result of vowel syncope in simplex words or vowel-epenthesis blocking in complex words. Such clusters have some kind of morphological restriction which overrides the phonological sonority hierarchy that allows consonants to cluster dis-obeying the hierarchy in many cases, as will be seen later. In the coda position, no consonant clusters are allowed, and accordingly, we can say that the sonority hierarchy controls the procedure allowing systematic epenthesis to occur so that a Standard Arabic CVCC structure is recognised as CVCVC, as we previously observed.

3.4. Vowel-initial syllables in ALA

In ALA, the verbs' (and related forms) formation affixes are the only environment of vowel-initial syllables. Such examples are /alʕɪb/ 'play, Imp.' and /ɪnʃɪɣʌl/ 'got, 3.SG.M. busy'. Usually, vowel-initial syllables start with some type of glottalisation as a preparation of the pronunciation of the vowel. The behaviour of the glottal-like utterance is different from that which underlyingly exists. Therefore, /(ʔ)ɪs.maʕ/ 'listen, Imp.' is underlyingly different from /ʔaħ.mɪd/ 'proper name' where the glottal stop is inserted in the first to occupy the empty onset, while it underlyingly exists in the second.

As previously discussed, vowel-initial syllables are restricted to word-initial positions. In addition to the ten Standard Arabic nouns and the definite article 'il-', they are also discovered in different forms of the verb by adding the verb formation prefixes to build the different Arabic verb forms, as we saw in Chapter Two and §2.2 above.

It is claimed by traditional grammarians that in addition to the verb-types formation affixes, underlying vowel-initial syllables can also be found in only ten nouns in MSA, as revealed in Chapter Two. It is also claimed in most of the studies that such a syllable undergoes resyllabification by inserting a glottal stop in initial utterances; a process of consonant prosthesis according to Watson (2002: 65), whereas the glottal stop is lost in non-initial positions. This claim of glottal-stop adjunction hails from the claim that Arabic syllables require an onset. A claim that is built on the belief that glottal stop is not morphemic in the

Arabic language and dialects, falling in to the trap of not recognising the difference between an underlying glottal stop and an epenthetic one.

As the discussion under §2.2.1, HW[50] is a vowel that is inserted to some derivational forms of the verb, such as the word-initial vowels in /ʊktʊb/ 'write!', /ɪmtaħan/ 'to examine', /ɪstafham/ 'sought explanation' and their related nouns such as: /ɪmtɪħæn/ and /ɪstɪfhæm/ which are derived from the verb roots: /k-t-b/, /m-ħ-n/ and /f-h-m/, respectively.

While the initial-vowel in /ʊktʊb/ is inserted as an imperative formation morpheme by itself, the vowel in /ɪmtaħan/ and /ɪstafham/ accompanies the infix inserted in the verb for these two types of verb formation. That is, while /ʊ/ is added to the root /k-t-b/, /ɪ/ is inserted to both /ɪmtaħan/ and /ɪstafham/ after the infixation of /t/ and the prefixation of /s/ respectively. The insertion of the vowel in the second case is to break up the consonant cluster that is created as a result of affixation. The representation of such verbs is as illustrated in Figures 1.16 and 1.20 above, applying the procedures (one-to-one and left-to-right).

In Arabic, the four verb formation prefixes /n-/, /st-/, /ʔ-/ and /t-/ create derivations such as: /nfaham/ 'is understood', /stafham/ 'sought, 3.SG.M. understanding', and /ʔafham/ 'understand, 1.SG.' and /tafæham/ 'communicated, 3.SG.M.'. Moreover, the infixation of /-t-/ also creates another verb derivation, such as /rtabatˤ/ 'is associated'. Despite the fact that the first four affixes are prosodically associated taking into consideration the procedures mentioned above and those under §3.5, the infixation process requires the Eight Binyan Flop rule to apply. The point to mention here is that in all five cases, there is a creation of an initial cluster which is not tolerated in MSA, in addition to dialects, such as ALA. McCarthy (1981) argues that the initial vowel is inserted in order to break up such clusters as those in: /nfaham/, /stafham/, and /rtabʌtˤ/, hence having the surface forms /ɪnfaham/, /ɪstafham/, and /ɪrtabatˤ/.

To conclude, vowel-initial syllables exist in ALA although sometimes a glottal-like gesture could be heard as a preparation of the vowel. Thus, as concluded from §2.2, there is a need for the recognition of the difference between underlyingly glottal-initial syllables and vowel-initial ones which might be received with a glottal-like gesture, similar to other world languages such as English.

3.5. Consonant clusters in ALA

The analysis that is favoured in this study is one which is based on the interpretation that consonant clusters do not exist underlyingly and that they occur as a result of word formation

[50] hamzatul-wasˤli.

(hence, the addition of grammatical information) in some way or another as, tautosyllabic clusters are not permitted within roots (Harris & Gussmann, 1999: 9). In ALA this view is supported where consonant clusters do not exist in monosyllabic words. Thus, the insertion in words such as /galıb/ ‘heart’ and /mılaħ/ ‘salt’ that are pronounced as /galb/ and /mılħ/ in MSA and many other Arabic dialects, occurs in the word formation stage and not as a result of the addition of grammatical information. Consequently, the consonant clusters in ALA are a result of vowel syncope due to grammatical information as we will observe below.

Generally speaking, ALA is a dialect that does not prefer consonant clusters. However, consonant clusters do exist in this dialect as a result of some phonological processes such as syncope. Morphological structure also plays a role in which word forms may contain initial consonant clusters. This should be differentiated from the initial consonant sequences that occur as a result of vowel epenthesis block in initially complex words.

Consonant clusters can be initial, internal or final. While initial are indicated in ALA, internal and final clusters are highly intolerable and rarely occur. Adjacent internal consonant sequences are always heterosyllabic. To start our discussion, we need to first identify how the term ‘consonant cluster ‘is defined in the literature.

Furthermore, to account for the issue in ALA, we need to first identify what is meant by consonant clusters and how they are different from consonant sequences.

3.5.1. What is a consonant cluster?

This issue is controversial amongst researchers as linguists differ in considering whether any adjacent consonants constitute a cluster even if they occur in two different syllables, or whether they should occur within the same syllable under either the onset or the coda position of that syllable. Abumdas (1985: 60), for example, provides a definition for the consonant cluster as being “a sequence of two or more consonants with no intervening vowels”, which implies that any adjacent consonants constitute a cluster even if they occur in different syllables. Moreover, the author claims that consonant clusters may occur word-initially, medially and finally. This implies that in a word such as /kıtabna/ ‘we wrote’; the ‘bn’ consonants constitute a cluster according to Abumdas’s definition.

Most researchers still do not agree with this definition and stipulate that the consonants must occur in the same syllable for them to be analysed as being a cluster. This definition is adopted in the current study. Thus, the ‘b’ and ‘n’ do not constitute a cluster and they are, rather, mere adjacent heterosyllabic consonants and therefore constitute a consonant sequence rather than a cluster and therefore, /kıtabna/ is syllabified as /kı.tab.na/ in ALA.

Addressing this difference helps to differentiate between constraints within a syllable and constraints across syllable boundaries. For example, in order to make any illicit sequence pronounceable one of the processes is to split the consonants into two different syllables. Therefore, a superior definition is that which defines a series of consonants to constitute a cluster when they occur in the same onset or the same coda positions in a syllable; in other words, a tautosyllabic sequence of consonants.

Moreover, what determines the types of consonant clusters that exist in a given language is its phonotactics.

To make the difference between heterosyllabic and tautosyllabic consonant sequences clear, an illustration of syllabification from ALA is exemplified below:

Table 3.15: Heterosyllabic consonant sequences in ALA

Word	**syllabification**	**Gloss**
/mıftæħ/	/mı**f.t**æħ/	key
/rkıbtiː/	/rkı**b.t**iː/	you (fem.) rode
/kıtabıthælkʊm/	/kı.ta.bı**t.h**æl.kʊm/	wrote, 1.SG. it to you, PL.
/mıntˤɑːd/	/mı**n.tˤ**æd/	air balloon

As we can note from the table, internal consonant sequences that might be thought of as being tautosyllabic as they can be ascertained in word-initial clusters according to the sonority hierarchy, are in fact heterosyllabic related to different syllables. As ALA is a dialect that does not benefit consonant clusters word-initially and those which exist are within a very strict environment, consequently, it does not permit consonant clusters word-internally. Thus, ALA does not follow the universal tendency which confirms that allowing consonant clusters to surface word-initially in a dialect implies the existence of the cluster in internal positions. In English, for example, a word such as *retrieve* is syllabified as *re.trieve* since words with the initial cluster ‘tr’ exists: *treat*.

In this section we address the kinds of consonant clusters in ALA, in order to reach a conclusion regarding why word-medial clusters do not exist in the dialect and how utterance-medial syllable-initial clusters are resyllabified.

3.5.2. Word-Initial consonant clusters

Despite the idea of consonant-cluster avoidance in ALA, as we have seen, there are some instances where word-initial consonant clusters do occur. There are mainly two cases of consonant clusters in ALA; one will be discussed in the rest of this section. The other one can sometimes be heard amongst some speakers (especially younger people) who are influenced by the capital's dialect (TLA). This is a common phenomenon amongst people in the western area of Libya and we will not be going any further than hint at it in this research, as such, clusters follow the rules of that dialect rather than the rules of the dialect under analysis (i.e. ALA).

Similar to many north western dialects in Africa, TLA is a dialect where initial consonant clusters surface more freely; even in cases where the sonority hierarchy is violated. Younger residents of Riyayna tend to imitate them in this respect. Apart from this, the rest of the cases of the occurrence of initial consonant clusters results from either phonological processes, for example syncope and metathesis, or for morphological reasons as we will see below.

In LA dialects which permit consonant clusters, Abumdas (1985: 66) claims that such initial consonant clusters occur as a result of vowel syncope and do not exist in the underlying form. He provides the following rule to explain the process.

(3.19) The vowel syncope rule in Libyan Arabic (Abumdas, 1985: 66)

$V \rightarrow 0$ /# C (+)____CV

e.g. /bɪlæd/ → [bɪlæd] ‘country’

/liː + kalbiː/ → [lkalbiː] ‘for my dog’

This rule applies systematically in TLA and some other Libyan dialects at the beginning of each word, with the initial syllable containing any consonant followed by any short vowel, no matter whether the first syllable is a separate morpheme or part of the stem.[51] The word that has syncope to be applied should be two syllables or more. In ALA, the environment where clusters show up is more restricted. The following table compares the difference between ALA and TLA in this respect. It demonstrates that while ALA allows consonant cluster surfacing in only certain environments, TLA applies vowel syncope in most if not all cases.[52]

[51] See also Al-Ageli (1995: 129-145).

[52] The data in this table is the writer's own pronunciation as a speaker of both TLA as well as ALA and applying consonant clusters in all cases.

Table 3.16: Consonant clusters, a comparison between TLA and ALA

Word			**Gloss**
TLA	**ALA**	**UR**[53]	
/rbʌħ/	/rbɪħ/	/rabaħ/	won, 3.SG.M.
/sbɪħ/	/sbɪħ/	/sɪbɪħ/	chaplets
/mrʊdˤ/	/mrʊðˤ/	/mɪradˤ/	became ill, 3.SG.M.
/nbʊx/	/nɪbʊx/	/nɪbʊx/	spray, 1.SG.
/hrʊk/	/hrʊk/	/hʊrʊk/	men's jilbaabs
/dhan/	/dɪhan/	/dɪhan/	greased, 3.SG.M.
/sʕaf/	/sɪʕaf/	/sɪʕaf/	fronds, N.
/sgʌf/	/sɪgʌf/	/sɪgʌf/	ceiling
/ngʌsˤ/	/nɪgʌsˤ/	/nɪgʌsˤ/	reduced
/wgʌf/	/wɪgʌf/	/wɪgʌf/	stood
/rmash/	/rɪmʌʃ/	/rɪmʌʃ/	blinked, 3.SG.M.
/smɑːr/	/smɑːr/	/sɪmɑːr/	became darker in color
/bʕeːn/	/bʕeːn/	/bɪʕeːn/[54]	with an eye
/nʒeːt/	/nɪʒeːt/	/nɪʒeːt/	survived, 1.SG.
/smɪnna/	/smɪnna/	/sɪmɪnna/	became, 1.PL. fatter
/bnɪttah/	/bnɪttah/	/bɪnɪttah/	girls

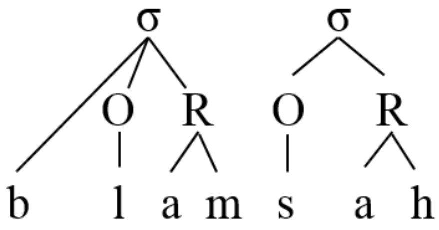
As is recognised in the table above, initial consonant clusters may surface only in certain environments in ALA within the same morpheme.

In prefixed forms, the absence of a vowel between the affix and the stem is not a case of vowel deletion, but is a case of epenthesis block instead. Thus, in words such as /bnɪjja/ 'with intention', /twakkɪd/ 'she confirms' and /blamsah/ 'with a touch', for example, the initial CCs are sequences with the first C being extrasyllabic rather than being part of the onset having the inputs: /b + nɪjja/, /t + wakkɪd/ and /b + lamsah/, correspondingly. In a prosodic analysis, the representation of the word /blamsah/ is as illustrated below.

(3.20) Prosodic representation of /blamsah/

[53] Ignoring the vowel difference that is only dialectal and has no structure formation difference and applying the TLA vowels as a default in this table.

[54] An argument will be made later that consonant clusters in morphologically complex words, such as /nbʊx/ and /bʕeːn/, if they exist, are a case of epenthesis block rather than vowel syncope.



All the examples with initial consonant clusters in ALA have one of the underlying structures CVCVC, CVCVGV(C) or CVCVVC, in addition to a restriction of the vowel type in the second syllable in both forms, as we will see soon.

The reason why the consonant cluster, in the examples in the table above, is considered to have been created by deleting the first vowel in the vowel melody level, is because this vowel is existent in other morphological forms that are created from the same word root and that the consonant cluster does not exist in any of the other forms. Consequently, the root √/rbħ/ ‘to win’ for example has the word forms: the verbal /ˈrbɪħ/ ‘won, 3.SG.M., the nominal /rɪ.ˈbʌħ/ ‘winning’, the plural suffixed verb /ˈrɪb.ħuː/ ‘won, 3.PL.’ and the feminine suffixed verb /ˈrɪb.ħɪt/ ‘won, 3.SG.F.’, and so on. Thus, the assumption is that in the absence of syncope, the verbal form would be /rɪ.ˈbɪħ/.

Vowel syncope in this type of structure, as in /ˈrbɪħ/, is only noticed when the vowel in the second syllable is the vowel /ɪ/ and /ʊ/. Consider the examples below:

Table 3.17: Initial consonant clusters in underlying CVCVC in ALA

Word	UR	Gloss
/ˈktʊb/	/ku.ˈtub/	books
/ˈgrɪb/	/gɪ.ˈrɪb/	came, 3.SG.M. closer
/ˈnðʊf/	/nu.ˈðuf/	is cleaned
/ˈbdɪl/	/bɪ.ˈdɪl/	suits, N.
/ˈtʕɪb/	/tɪ.ˈʕɪb/	got, 3.SG.M. tired
/ˈwʒɪd/	/wɪ.ˈʒɪd/	is found
/ˈtrʊd/	/tɪ.ˈrud/	replies, 3.SG.M.
/ˈsmɪn/	/sɪ.ˈmɪn/	became, 3.SG.M. fatter
/ˈwlɪʕ/	/wɪ.ˈlɪʕ/	is turned on
/ˈʕðɪb/	/ʕɪ.ˈðɪb/	(the water) became fresh

As we can detect here, the vowels in the second syllable in the underlying forms are either /ɪ/ or /ʊ/. All words are bisyllabic with short vowels. In addition to the type of vowel, we can notice that all the underlying vowels are not stressed and stress falls in the second syllable following a tendency in ALA to stress the last syllable, as we will observe in the following chapter.

Now notice the words in the table below where the second syllables in the bisyllabic words have one of the vowels /a/ or /ʌ./ The short unstressed vowel in the preceding syllable is not syncopated.

Table 3.18: Non-resyllabified CVCVC in ALA

Word	UR	Gloss
/kɪ.ˈθab/	/kɪ.ˈθab/	dune
/sɪ.ˈʕal/	/sɪ.ˈʕal/	coughed, 3.SG.M.
/lɪ.ˈbas/	/lɪ.ˈbas/	wore, 3.SG.M.
/tˤɪ.ˈhʌg/	/tˤɪ.ˈhʌg/	became excited. 3.SG.M.
/tˤɪr.ˈʌðˤ/	/tˤɪ.ˈrʌð/	expelled, 3.SG.M.
/ðˤɪ.ˈħʌk/	/ðˤɪ.ˈħʌk/	laughed, 3.SG.M.

We can note in this table that the second syllable in the bisyllabic words contain either the vowel /a/ or /ʌ/. The stress position is the same as in Table 3.17 above, though counting the initial syllable as unstressed in both groups of words.

To illustrate how words with different vowels behave differently and how different vowels affect words with similar structures, the following table has two lists of words to compare. This also includes the optional pronunciations of the same words that can be heard in the dialect (such as /ˈsmɪʕ/ and /sɪ.ˈmaʕ/ ‘he heard’). Consider:

Table 3.19: Optional syncope in CVCVC ALA

Word	**UR**	**Gloss**	**Word**	**UR**	**Gloss**
/ˈxmɪr/	/xɪ.ˈmɪr/	rotted	/xɪ.ˈmʌr/	/xɪ.ˈmʌr/	rot (N.)
/ˈbdɪl/	/bɪ.ˈdɪl/	suits (clothes)	/bɪ.ˈdal/	/bɪ.ˈdal/	alternative
/ˈzʕɪl/	/zɪ.ˈʕɪl/	became sad, 3.SG.M.	/zɪ.ˈʕal/	/zɪ.ˈʕal/	V/ N became sad / sadness
/ˈwsˤɪl/	/wɪ.ˈsɪl/		/wɪ.ˈsˤʌl/	/wɪ.ˈsˤʌl/	arrived, 3.SG.M.
/ˈmnɪʕ/	/mɪ.ˈnɪʕ/	escaped, 3.SG.M.	/mɪ.ˈnaʕ/	/mɪ.ˈnaʕ/	disallowed, 3.SG.M.

The case of optionality of pronunciation is only possible when there is no conflict in meaning under the same word category, in other words only when syncope does not result in lexical homophony. Thus, /ˈktɪb/ ‘is fated’ for example (with its passive meaning) is not optionally pronounced as /kɪˈtab/ since /kɪ.ˈtab/ has an active meaning: ‘wrote, 3.SG.M.’. Similar examples are: /ˈwʒɪd/ ‘is founded’ and /wɪ.ˈʒad/ ‘found, 3.SG.M.’.

As can be seen from the tables above, both groups consist of words of the structure CVCV́C with the first syllable being un-stressed and the only difference is the vowel type of the second syllable. Thus, the conclusion that may be drawn so far is as follows:

(3.21) Vowel syncope rule in ALA[55]
Vowel syncope occurs in initial open short unstressed syllables in bisyllabic words when the vowel of the second syllable is either /ɪ/ or /ʊ/.

Let us now think about another setting where vowel syncope occurs in ALA. Consider the table below where bisyllabic words that have the structure CV.CVVC behave differently.

[55] Bearing in mind that [e] is an allophone of /ɪ/ in ALA and is an individual preference whether to use [ɪ] or [e].

Table 3.20: CVCVVC in ALA[56]

Word	US	Gloss
/ˈxʃæn/	/xɪ.ˈʃæn/	became, 3.SG.M. fatter
/ˈlbæs/	/lɪ.ˈbæs/	clothes
/ˈkdæs/	/kɪ.ˈdæs/	piles
/ˈħbæl/	/ħɪ.ˈbæl/	ropes
/ˈtˤwɑːl/	/tˤɪ.ˈwɑːl/	became, 3.SG.M. tall / long
/ˈsɣɑːr/	/sɪɣ.ˈɑːr/	kids
/ˈħmɑːr/	/ħɪ.ˈmɑːr/	donkey
/ˈsbuːl/	/sɪ.ˈbuːl/	pop corn
/ˈgʕuːd/	/gɪ.ˈʕuːd/	staying, PL.
/mɪ.ˈniːʕ/	/mɪ.ˈniːʕ/	strong
/sɪ.ˈmiːn/	/sɪ.ˈmiːn/	fat, Adj.
/mɪ.ˈliːħ/	/mɪ.ˈliːħ/	awesome
/rɪ.ˈgiːg/	/rɪ.ˈgiːg/	slim
/wɪ.ˈʒiːʒ/	/wɪ.ˈʒiːʒ/	noise
/mɪ.ˈriːðˤ/	/mɪ.ˈriːðˤ/	sick
/gɪ.ˈreːt/	/gɪ.ˈreːt/	read, 1.SG.
/xɪ.ˈðeːt/	/xɪ.ˈðeːt/	took, 1.SG.
/lɪ.ˈgeːt/	/lɪ.ˈgeːt/	found, 1.SG.
/tɪ.ˈreːt/	/tɪ.ˈreːt/	it seems to be

We can note from the table above that we have two groups of words: one applied vowel syncope (in the first nine words) whereas the other (the rest) blocked the application of the vowel syncope. In the first set of words the long syllable has one of the vowels /ɑː/, /æ/ or /uː/ but the second set has either the vowel /iː/ or /eː/. Stress behaviour is similar to those in Tables 3.18 and 3.19 above.

Accordingly, we conclude that short unstressed vowel syncope applies when the long vowel in the following syllable in a bisyllabic word is /ɑː/, /æ/ or /uː/.

A comparison between CVCVC and CVCVVC can also be addressed to illustrate the difference in vowel behaviour. Consider:

[56] Exceptions such as /bɪlæd/ and /rɪmɑːd/ will be addressed shortly.

Table 3.21: A comparison between CVCVC and CVCVVC in ALA

Word	Gloss	Word	Word
/nðʊf/	is cleaned	/nɪði:f/	clean, Adj.
/grɪb/	came closer	/gɪri:b/	close, N.
/mnɪʕ/	escaped	/mɪni:ʕ/	strong
/xʃɪn/	became fatter	/xɪʃi:n/	fat

A third case where vowel syncope is noticed is in words having the structure CV.CVG(V). Hence, as it is optional, it only occurs between the new generations and does not follow any vowel restrictions; it is considered to be a TLA influence. Hence, it is not discussed further in the current research given that this does not follow the dialects phonotactics but the TLA's instead. Such examples though, might be /bnajja/ ~ /bɪnajja/ 'girl', /hnɪjjah/ ~ /hnɪjjah/ 'pleasant'.

As can be seen from the examples discussed in this section, initial-consonant clusters violate the Sonority Sequencing Principle in a vast majority of cases, with the main influential factor being the type of the vowel in the following syllable, in addition to the structure of the word to be bisyllabic with the syllable structures CV.CVC or CV.CVVC. The vowel syncope rule in 3.21 can be revised to include both sets of vowel restrictions as follows:

(3.22) Vowel type restriction in ALA

Non-underlying initial consonant clusters occur as a result of vowel syncope in CVCVC and CVCVVC syllables provided that the vowel of the second syllable is /ɪ/, /ʊ/,/ɑ:/, /æ/ or /u:/.

Other factors also play a role in consonant-cluster creation and occurrences in ALA. Such examples are place of articulation of consonants, sonority distance, and voicing. Accordingly, if the creation of consonant clusters is enabled by obeying the vowel requirement in 3.22 above, consonant clusters that can surface in ALA word-initially are investigated. The chart below explains all possible occurrences of consonant clusters that really exist in the dialect, or are possible but do not happen to occur. The chart will be filtered afterwards, leaving only the possible CC clusters that exist in morphologically non-complex words after applying the different influencing factors. Examples to support the chart below and the filtered chart to follow can be located in Appendix (1).

The first column on the left contains possible C_1 constituents, whereas the upper row includes possible C_2 constituents of a C_1C_2 utterance-initial cluster. Hence, for example, 'bt' clusters do not exist, whilst 'bd' clusters exist in the dialect.

(3.23) Initial Consonant clusters in ALA

	b	t	d	k	g	tˤ	sˤ	f	θ	ð	s	z	ʃ	ʒ	x	ɣ	ħ	ʕ	h	ðˤ	m	n	l	r	j	w
b			✓	✗	✗	✓	☑									✗	✗	☑	✓			☑	✗	✓	☑	
t								✓					✓											✓		
d	✓			✓				✓						✗	✗			✗	✗		✗	✗	✗	✗	✗	✗
k	✓	✓	✗					✓	✓		☑										✓		✗	✗	☑	☑
g	✗	✗	☑			✓	✗			✗		✗	✗	✓			✓	✗		✗	✓	✗	✗	✓		
tˤ	✗																									✗
sˤ	✓		✓		☑	✓		✓							✓	☑	✓	✓			✓	✓	✗	✓	✓	
f		✓				✗					✓		✓	✓	✓				✓	✗		✗	✗	☑	✗	
θ					✓										✓											
ð																			☑						✓	
s	✓	✓		✓	☑										✓		☑		✗		✓		✓	✗		☑
z																		✓							✓	
ʃ	✓		✓	✗				✓							✓			✓	☑		✓	✓	✓	✓	✓	✓
ʒ	✓		✓					✗								✗					✗	✗				
X									✓				✓							✓	✓		✓	✓		
ɣ																				✓			✓	✓	✓	✓
ħ	✓			✗			✗														✗	✗				
ʕ	✗	✓	✗		✗	✗				✓				✗									✗		✗	✗
h	☑													✗										✓	✗	✓
ðˤ	✓																	✓	✓				✗	✓	✓	
m	✓	✓	✓	✗	✗	✗					✗	✗	✗		✗		✗	✗				✓	✗	✗		
n	✗		✗										☑	✗	✗	✗	✗	✗	✗	✗						
l	✓										✗	✗		✗			✓				✓				✓	✗
r	✓		✓	✓	✓	✓	✗					✗	✗		☑			✗	✓	✓	✗				✓	
j	✓																									
w						✗	✓	✗	✓	✓	✓		✓	✓			✓	✓	✓	✓			✓	✓		

Notes in relation to the chart:

- The symbol ✓ indicates the existence of the cluster in ALA whereas ✖ indicates that words exist although syncope is unlikely to occur even in accidently non-occurring clusters. ☑ indicates that the cluster exists in one syllable form but is blocked in the other (CVCVC and CVCVVC). Examples to justify every case are listed in Appendix (1) in order.
- The left-hand column is the first member of a cluster, the row across the top is the second, and the symbol at the intersection informs whether or not it's possible.
- The examples represented by the chart are all non-prefixed words.
- There is no identification of non-underlying emphatics in the chart. The reason for this is because the existence of such emphatics is obviously recognised from the type of vowel in the following syllable. As explained in Chapter Two, non-underlying emphatic consonants exist as a result of emphasis spread of either one of the underlying emphatic consonants or one of the vowels /ʌ/ or /ɑː/ that exist in the same word. Thus, if such word structures with consonant clusters would occur in ALA, vowel syncope is not expected in CVCVC when the first consonant is either /$t^{ʕ}$/, /$s^{ʕ}$/ or /$ð^{ʕ}$/, since being underlyingly emphatic would require the vowel in the second syllable to be /ʌ/. Consequently, the vowel type restriction mentioned in 3.22 above blocks the vowel syncope process. In the same way, the process is expected to take place in $t^{ʕ}$VCVVC and $s^{ʕ}$VCVVC and the long vowels are implied to be either /ɑː/ or /uː/.
- Combinations that are possible in the dialect; however, are not detected to the knowledge of the writer and are not included in the chart as existents. The shaded cells indicate this possibility though.
- Combinations where the first consonant is a different morpheme are not included since, as is mentioned before, they do not constitute clusters, but are heterosyllabic instead as we will see later. Thus, when the first consonant is either b, t, m, n, l, j or w predictions of words containing clusters are not indicated because most cases of the combinations bC, tC, mC, nC, lC, jC and wC are in fact morphologically complex with the first constituent being a prefix.
- The epenthetic glottal stop is excluded as it behaves differently, as argued in Chapter Two, and as we will become aware of later in this chapter.
- An initial non-epenthetic glottal stop requires a vowel to follow it and hence is not indicated in ʔC clusters.

- Cʔ clusters cannot exist in the dialect as, similar to many modern Arabic dialects; there is a tendency to lose it in non-initial positions unless it has the requirement pointed out in Chapter Two above, which is not met in CVCVC and CVCVVC structures.
- Identical consonants do not underlyingly exist word-initially. Those which exist as a result of affixation create geminates rather than clusters: /bbæb/ ~ /biː- + bæb/ 'with a door', /llaħaðˤah/ ~ /ɪl- + laħaðˤah/ 'the moment'.
- Empty cells indicate impossibility of consonant combinations.
- Sonority is not followed in many cases.

Some ambiguous cases that might be thought of as containing consonant clusters, in fact contain sequences. Therefore, awareness of their status makes it obvious that they are not instances of consonant clusters. Such examples are: /ʃkæl/ 'shapes', /mbɑːˤrɪk/ 'blessed', /ltɪfat/ 'turned round, 3.SG.M.', /ʒtæz/ 'passed', /ɣtar/ 'is deceived', /ltɪwɑː/ 'is bent', /mtad/ 'spread', /wlæd/ 'boys', /ftˤɑːr/ 'breakfast' actually all have the pronunciations and syllabifications: /ʔash.kæl/, /ʔɪm.bɑː.rɪk/, /ʔɪl.tɪ.fat/, /ʔɪʒ.tæz/, /ʔɪɣ.tar/, /ʔɪl.tɪ.wɑː/, /ʔɪmtad/, /ʔaw.læd/, /ʔɪf.tˤɑːr/ in careful speech.

As a conclusion of the above discussion, consonant clusters that may surface in ALA are revealed in the chart below. They are organised according to the consonants' feature-combinations of sonorants (SON) and obstruents (OB) as below.

(3.24) Types of initial consonant clusters in ALA

OB/OB	bd	btˤ	bsˤ	bʕ	bh	tf	tʃ	db	dk	df	kb	kt	kf	kθ	ks	gd	gtˤ	gʒ
	għ	sˤb	sˤd	sˤg	sˤtˤ	sˤf	sˤx	sˤɣ	sˤħ	sˤʕ	ft	fs	fʃ	fʒ	fx	fħ	θg	θx
	ðk	ðh	sb	st	sk	sg	sx	sħ	zʕ	ʃb	ʃd	ʃf	ʃx	ʃʕ	ʃh	ʒb	ʒd	xθ
	xʃ	xðˤ	ɣðˤ	ħb	ʕt	ʕð	hb	ðˤb	ðˤʕ	ðˤh								
OB/SON	bn	br	bj	tr	km	kj	kw	gm	gr	sˤm	sˤn	sˤr	sˤj	fr	ðj	sm	sl	sw
	zj	ʃm	ʃn	ʃl	ʃr	ʃj	ʃw	xm	xl	xr	ɣl	ɣr	ɣj	ɣw	hr	hw	ðˤr	ðˤj
SON/OB	mb	mt	md	nʃ	lb	lħ	rb	rd	rk	rg	rtˤ	rx	rh	rðˤ	jb	wsˤ	wθ	wð
	ws	wʃ	wʒ	wh	wʕ	wħ	wðˤ											
SON/S	mn	lm	lj	rj	wl	wr												

As is evident from the chart, the combination of obstruent/obstruent (OB/OB) is the most dominant type in ALA. This is called “obstruent clusters” by Morelli (1990) and is the most popular type across languages with 64 out of 131 existent clusters in ALA (49%). The second dominant type is the obstruent/sonorant (OB/SON) combination (28%), followed by the sonorant/obstruent (SON/OB) combinations (19%), with the sonorant/sonorant (S/S) being the least dominant type (with only 5%). There is an obvious violation of sonority in the third cluster type, though violation in the OB/OB and the S/S types is tolerable considering the non-high sonority distance. However, the recurrence of OB/OB is much higher than SON/SON. The following table depicts the percentage existence of each type:

Table 3.22: Frequency of occurrences of obstruent clusters in ALA

OB/OB		**OB/SON**		**SON/OB**		**SON/SON**	
/131	%	/131	%	/131	%	/131	%
64	49%	36	28%	25	19%	6	5%

The fair number of OB/SON compared to the rest is obeying the universal sonority requirement and thus is not problematic. At the same time, the SON/OB reflects a high number of violations compared to the previous type, and can be claimed to be purely governed by the morphological structure of the word, as explained earlier in the section.

In her study of "Obstruent clusters" (OB/OB), Morelli (1999) reveals that this type is the most common type in world languages. Such clusters are a combination of a stop and a fricative in any direction or a sequence of two stops or fricatives. Therefore, four possible obstruent combinations are confirmed in different languages as illustrated below:

(3.25) Types of obstruent clusters in other languages (Morelli, 1999:32)

- F/S (e.g. English /st/, Havasupai /θp/, Haida /ɬk/, German /ʃt/)
- S/F (e.g. Wichita /ks/, Paipai /px/)
- F/F (e.g. Italian /sf/ , Nisqually /sx/)
- S/S (e.g. Khasi /pt/, Georgian /tp^h/)

Morelli analysed data collected from samples of thirty world-languages that allow initial consonant clusters, initialising fifteen different possible types of obstruent clusters depending on the types in 3.25 above. In doing so, she indicated that only six types occur cross-linguistically and therefore identified six language types accordingly. Morelli's classification is illustrated underneath:

(3.26) Types of languages according to the co-occurrence of obstruent clusters (Morelli, 1999: 42)

	F/S	S/F	S/S	F/F
Language type 1	✓			
Language type 2	✓			✓
Language type 3	✓	✓		
Language type 4	✓	✓		✓
Language type 5	✓	✓	✓	
Language type 6	✓	✓	✓	✓

The arrangement of the obstruent types in this way implies the existence of the right most cluster type if any of the ones in the left exist. That is, in language type 2 for example, the existence of FF implies the existence of FS; hence, if FF clusters exist in a language, this implies that FS clusters exist in the same language, and so on.

F/S is the most popular type across-linguistically. The existence of FS clusters in ALA is not the highest number though, where only 15 out of 78 (19%) possibilities (according to Chart 3.24 above). The highest occurrence of obstruent clusters in ALA is the S/S type with 12 existent clusters out of 42 possibilities (29%). S/F only constitutes 16 out of 98 possibilities (16%), while FF showing the least frequency with only 12%. For that reason, ALA is said to be a type 6 language. The following table shows the numbers according to Chart 3.24 above.

Table 3.23: Frequency of obstruent-clusters OB/OB occurrence in ALA

F/S		**S/F**		**S/S**		**F/F**	
15/78	19%	16/98	16%	12/42	29%	21/182	12%

Obstruent/sonorant OB/SON is the second highest type existent in the dialect. It contains the types: stop/sonorant S/SON and fricative/sonorant F/SON with almost equal percentages 31% (13/42) and 30% (23/78) respectively.

Sonorant/obstruent SON/OB has two types as well. These are SON/S and SON/F with 10 clusters out of 36 possibilities (28%) of SON/S and only 15 out of 84 (18%). These are revealed below:

Table 3.24: Obstruent/sonorant OB/S and Sonorant/obstruent SON/OB

OB/SON				**SON/OB**			
S/SON		**F/SON**		**SON/S**		**SON/F**	
13/42	31%	23/78	30%	10/36	28%	15/84	18%

Although the above discussion reveals that initial consonant clusters are possible syllable starters in ALA, initial epenthetic syllables containing a glottal stop plus a vowel may occasionally be heard before the utterance of such syllables in forceful in addition to careful speech. As seen before, the glottal stop in this epenthetic syllable is non-phonemic and is different from the behaviour of the phonemic one that might occur in similar situations, as we detected in the previous chapter.

3.5.3. Internal consonant clusters or heterosyllabic sequences?

As previously discussed, consonant clusters do not exist in any other place than word-initially. All word-internal clusters are in fact heterosyllabic relating to two adjacent syllables. Such examples are those which are discussed in Table 3.15 above, where the internal consonants in the words /mɪftæħ/, /rkɪbtiː/, /kɪtabɪthælkʊm/ and /mɪntˤɑːd/ are syllabified as:

/mɪ**f.t**æħ/, /rkɪ**b.t**iː/, /kɪ.ta.bɪ**t.h**æl.kʊm/ and /mɪ**n.tˤ**ɑːˤd/ respectively (with the underlined consonants being the target).

Although the current study's domain of analysis is the word, it is worth pointing to the word-initial consonant clusters phrase-medially. In such a situation the consonant clusters that are mentioned above all undergo resyllabification in internal positions in phrases. Examples are as follows:

(3.27) Resyllabification of word-initial clusters phrase-medially

ɪ n t iː r k ɪ b t iː ~ /ɪntiː + rkɪbtiː/

R O R ‘2.SG.F, rode’

w a j h ɪ k ɪ s w ɑː d ~ /wajhɪk + swɑːd/

O R ‘your, F. face became black’

3.6. Initial heterosyllabic consonants

The concatenation of affixes usually requires that vowels are added between the stem and the affix. Consider the examples underneath:

(3.28) Vowel insertion for prefix concatenation in ALA

/tɪrɑːʒiː/	from	/t + rɑːʒiː/	waits, 3.SG.F
/tɪlagga/	from	/t + lagga/	caught, 3.SG.M
/nɪbædiː/	from	/n + bædiː/	begin, 1.SG
/nɪsæfruː/	from	/n + sæfruː/	travel, 1.PL
/jarɪkʊb/	from	/j + rɪkab/	rides, 3.SG.M

We see that a vowel is inserted between the prefix and the stem in the previous words. This is not always the case though as there are examples where no vowel insertion happens. Hence, the examples below should be considered.

(3.29) Vowel epenthesis block in prefix concatenation in ALA

/tlɪf/	/t + lif/	wrap, 3.SG.F
/nfiːd/	/n + fiːd/	benefit, 1.SG
/nsæwuː/	/n + sæwuː/	tidy up, 1.Pl
/jkæfiː/	/j + kæfiː/	reward, 3.SG.M

To this point, to conclude, as previously stated, the consonant cluster formation in ALA is only restricted to certain type of words with a phonological restriction of the type of vowels. Therefore, the universal claim that possible initial clusters are those that can appear as possible word-initial clusters[57], do not apply to those exist in ALA. Most of the clusters do not even subsist in word-internal positions. Consequently, any adjacent consonants word-internally are automatically syllabified as heterosyllabic not tautosyllabic. Initial consonant clusters are resyllabified as heterosyllabic consonants in phrase medial utterances. Initial consonant sequences in morphologically complex words are heterosyllabic.

[57]This is interpreted in Venneman's (1972b: 11) "law of Initials" where, he claims "medial syllable-initial clusters should be possible word-initial clusters" or, more comprehensively, in Bell's (1976: 255) "Kuryłowicz Condition" that "initial and final clusters of medial syllables conform to the same constraints as those in initial and final syllables".

Chapter 4: Syllabification and Resyllabification

4.0. Introduction

The current chapter addresses issues that are essential to syllabification in ALA. Adopting a moraic approach in the current study implies the belief in the role of the syllable weight in identifying the stress assignment parameters. Thus, a discussion with a review of the issue of syllable weight is followed by a discussion to identify the stress parameters of ALA syllable. In doing so, it is crucial to review the debate concerning the notion of "superheavy syllables" with a reminder that the current study is not assessing one theoretical framework against the other. It is about using the existing approaches to explain the linguistic phenomena in the dialect more appropriately. The issues of extrametricality and extrasyllabicity are also discussed.

As the discussion flows, some phonological repair processes that occur in the dialect are examined so that a greater understanding of the resyllabification process in ALA is gained. Such processes are vowel epenthesis, deletion and lengthening. The consonant repair processes that are discussed in the previous chapters will not be discussed further.

4.1. Syllable weight

In a moraic approach, syllables are divided into light and heavy. The rhyme is the constituent that defines the weight of the syllable, while the onsets do not contribute weight to syllables. Heavy syllables are those which normally attract stress. Blevins (1996: 215) provides the following definition of syllable weight dividing the world's languages into three groups.

(4.1) Structural definition of syllable weight (Blevins, 1996: 215)

	Light	**Heavy**	**Heaviest**
Type 1	non-branching rhyme		branching rhyme
Type 2	non-branching nucleus		branching nucleus
Type 3	non-branching rhyme	branching rhyme	branching nucleus

Zec (2003) refers to the distinction between two sources of syllable weight: A mora count source (posited in Hyman (1985), McCarthy and Prince (1996) and Hayes (1989)) and the sonority of nucleus count that is discussed in Hayes (1995) and Gordon et al (2012).

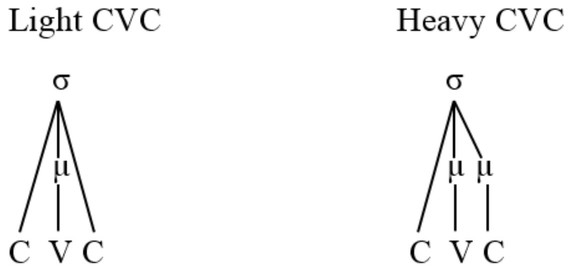
As briefly mentioned in Chapter One, phonological weight is defined in terms of the presence or absence of two skeletal positions in X-slot theory, whilst in moraic theory, a heavy syllable is that which has two moras. Consult §1.3 for the illustration of both models.

We will return to syllable weight under the stress section. In the following few sub-sections, we will examine the three issues that have an impact on the syllabification process, in order to be able to identify the syllabification algorithm of ALA in the following section. Thus, the status of CVC and CVVC syllable types in ALA are discussed below.

4.1.1. Heavy and light CVC in Arabic

Encapsulating the discussion in Chapter Three, the behaviour of CVC syllable as being heavy or light is a language specific matter having one of the structures below:

(4.2) Heavy and light CVC



The reason for these two interpretations is related to the stress behaviour with regard to the position of this syllable type in different languages.

According to Zec (1995), minimal sonority is identified on two different levels; syllable weight is restricted by mora, whereas syllabicity is restricted by the syllable. Her assumption, following Prince (1983: 87-58), is built upon the claim that there is a strong correlation between the syllabicity of segments and their sonority classes in a given language. In the same way, segments that contribute to the syllable weight, she argues, respond to a similar constraint where heaviness, and accordingly the moraicity of segments correlates to their sonority, bearing in mind the variation in the identity of weight-bearing segments amongst different languages being vowels, sonorants or even obstruents. (Zec, 1995: 89)

Zec (1995: 91-92) assumes that, for a consonant to bear weight, and accordingly be moraic, the consonant’s sonority needs to be identified according to the language-specific sonority classes. Zec provides an analysis where she differentiates between a peak mora and a non-peak one. She claims that the identity of the two moras is different given that the peak (leftmost) mora is constrained by sonority as well as syllabic constrains (being syllabic) and the non-peak (rightmost) mora is only controlled by sonority (being sonorous).

The different behaviour of CVC as either attracting or not contributing to stress, being in final or non-final positions is accounted for in moraic analysis by relating to the final consonant extrametricality, where segments (in this case, consonants) in final positions are excluded from the stress assignment procedure by being invisible to Hayes' Weight-by-Position rule mentioned in §1.4 above. Extrametricality is as mentioned before a rule-based device first introduced by Liberman and Prince (1977) and is used in the metrical theory of stress to account for the ignorance of stress rules by certain syllables. In Arabic dialects, in addition to some other languages, final CVC is light because the last C is extrametrical, while the last C in non-final CVC is a weight-bearing segment. The representation of each and the extrametricality issue are discussed below.

4.1.2. CVC in ALA

The behaviour of CVC in ALA is interesting given that utterance-final CVCs are stressed in bi-syllabic CV.CVC. Note that the grammatical function plays a role here as CV.CVC sequences are usually verbs and have the final syllable stressed, as we will see later. This follows from a general tendency to stress the rightmost syllables in North African dialects. Nouns with similar syllable structure sometimes follow the same stress procedure. However, in many other situations, final CVC appears not to attract stress. Such examples of stress attracting versus non-attracting final CVCs are those in the table below, including both categories of verbs and nouns.[58]

[58] More in-depth discussion of the stress assignment in ALA will follow.

Table 4.1: Final CVC in ALA (Stress)

Stressed final CVC		Non-stressed final CVC	
Word	**Gloss**	**Word**	**Gloss**
/lɪ.ˈgɪt/	found, 3.SG.F.	/ˈkɪ.tɪ.bɪt/	wrote, 3.SG.F.
/ʃɪ.ˈfit/	became, 3.SG.F. well	/ˈmæ.tɪt/	died, 3.SG.F.
/θɪ.ˈnɪt/	bended, 3.SG.F.	/ˈtæ.ʕɪb/	sick, M., ADJ
/gɪ.ˈrɪb/	approached, 3.SG.M.	/ˈʃɪ.fɪt/	saw, 1.SG.
/xɪ.ˈdaʕ/	betrayed, 3.SG.M.	/ˈrɪ.jɪl/	leg
/lɪ.ˈʕab/	played, 3.SG.M	/ˈsɪ.mɪn/	overweight
/sɪ.ˈʔal/	asked, 3.SG.M.	/ˈrɪ.baħ/	profit
/lɪ.ˈɣʌb/	gums, SG. N.	/ˈbʌ.tˤɪn/	stomach
/mɪ.ˈrʌðˤ/	sickness, N.	/ˈwɪ.ðɪn/	ear
/wɪ.ˈsˤʌx/	dirt, N	/kɪ.ˈtæb.kum/	your, PL. book
/wɪ.ˈɣʌf/	contagious infection, N.	/ˈsɪ.maħ/	beautiful, M.

As we can see, the column on the left contains verbs and nouns having the syllable sequence CVCVC. In the right column, there are five types of words. The word /ˈkɪ.tɪ.bɪt/ on the right column is morphologically similar to the first three on the left column; these are: /lɪ.ˈgɪt/, /ʃɪ.ˈfit/ and /θɪ.ˈnɪt/. Both groups are verbs that end with the feminine marker /-t/. Thus, the first group has the structure CV.CVC, whilst the second has the underlying structure CVC.CVC with the stress falling on the first syllable that is resyllabified as CV.CV.CVC with a medial epenthetic vowel and with the reserved stress to the first syllable. Similar examples are /bɪ.ˈnɪt/ ‘built, 3.SG.F.’, /xɪ.ˈðɪt/ ‘took, 3.SG.F.’ and /rɪ.ˈmɪt/ ‘miscarried, 3.SG.F.’.

The second type is a word having the structure CVV.CVC with the same feminine marker. CVV is required to have the stress on it as it is long. This can be seen in both feminine and masculine words. Such examples are: /ræ.gɪd/ ‘is asleep, 3.SG.M.’, /ræ.gɪt/ ‘calmed down, 3.SG.F.’, /sˤɑːbɪr/ ‘patient, 3.SG.M.’ and /siːdak/ ‘your father’. In addition, /ˈʃɪ.fɪt/ is a verb with a dependant pronoun: /ˈʃæf + -t/ ~ /ˈʃɪf-t/ ~ /ˈʃɪ.fɪt/.

As can be noticed from the examples, dependent pronouns, being clitics, do not receive stress. Dependent pronouns are different from other attached morphemes such as the feminine marker that contributes to the word formation rather than adding a phrasal meaning as dependent pronouns. The difference is obvious in comparing /ˈʃɪ.fɪt/ ‘saw, 1.SG.’ with /ˈʃɪ.fɪt/ ‘became, 3.SG.F. well’. Other examples with the dependent pronouns are: /ˈxʊ.fɪt/ ‘terrified, 1.SG.’, /ʕɪ.ˈrʌ.fɪt/ ‘I knew’ and /fɪ.ˈha.mɪt/ ‘understood, 1.SG.’.

The nouns in the left column of the above table /lɪ.ˈɣʌb/, /mɪ.ˈrʌðˤ/, /wɪ.ˈsˤʌx/ and /wɪ.ˈɣʌf/ have the same segmental and morphological structure of those in the right column: /ˈrɪ.jɪl/, /ˈsɪ.mɪn/ and /ˈrɪ.baħ/ since they are both lists of nouns that have the syllable template: CV.CVC. The case is not predictable and hence, such words are recognised by the intuition of an indigenous person. Another factor to take into consideration that works in most cases is that stressing the first syllables when stressing the second would confuse with the related verbs. Thus, the nouns /ˈsɪ.mɪn/ and /ˈrɪ.baħ/ are different from the verbs /sɪ.ˈmɪn/ 'overweighed, 3.SG.M.' and /rɪ.bɪħ/ 'won, 3.SG.M.' which are also uttered as: /ˈsmɪn/ and /ˈrbɪħ/ with vowel syncope, as we noted before.

The words /ˈbʌ.tˤɪn/ and /ˈwɪ.ðɪn/ synchronically have the structure CVCC in MSA, although they are realised as CVCVC in ALA because coda consonant clusters are not tolerable in ALA and the CVCC syllable structure is not one of the possible syllables in this dialect. Thus, being synchronically inserted, the vowel does not receive the word's main stress.

The last word in the table, that is: /ˈsɪ.maħ/ is an adjective. Such adjectives do not follow the verb stress pattern and therefore the final CVC is unstressed.

Initial CVC can also be stressed in ALA. Such examples are those in the table below.

Table 4.2: Stressed initial CVC in ALA

Word	Gloss
/ˈʒɪt.na/	came, 3.SG.F. to us
/ˈbɪn.tɪ.na/ / /ˈbɪ.nɪt.na/	our daughter
/ˈwɪð.niː/	my ear
/ˈmɪn.kʊm/	from you, PL.
/ˈʒɪt.kʊm/	came, 3.SG.F. to you, PL.
/ˈbɪn.tak/	your, M. daughter
/ˈwɪð.nɪk/	your, F. ear
/ˈmaz.rɪ.ʕʌh/	farm
/ˈmad.rɪ.sah/	school
/ˈmʌr.wɪ.ħʌh/	air fan

The first seven words have a syllable dependent pronoun which, as revealed above, does not receive the main stress. Therefore, the first syllables that have the CVC structure, receive stress. The second choice on /ˈbɪn.tɪ.na/ is also pronounced with vowel metathesis having the optional pronunciation /ˈbɪ.nɪt.na/. Similar examples with the optional vowel alternation are: /ˈmɪl.kɪ.na/, /ˈmɪ.lɪk.na/ ‘our property’, /ˈkal.bɪna/, /ˈka.lɪb.na/ ‘our dog’, and so on.

Similar to /ˈbɪn.tɪ.na/, /ˈmaz.rɪ.ʕʌh/, /ˈmad.rɪ.sah/ and /ˈmʌr.wɪ.ħʌh/ also have the optional pronunciation /ˈma.zɪr.ʕʌh/, /ˈma.dɪr.sah/ and /ˈma.rɪw.ħʌh/ respectively.

In the following examples that have the structure CVC.CVC, there is a tendency to stress the first rather than the final CVC. Consider:

Table 4.3: Stress in CVC.CVC words in ALA

Word	**Gloss**
/ˈmʌs.rʌʕ/	how quick!
/ˈmad.xɪl/	entrance
/ˈman.bɪt/	source / origin
/ˈwar.dah/	rose
/ˈmɪn.ʒɪl/	billhook

Such nouns are preferably pronounced as: /ˈmʌ.sɪ.rʌʕ/, /ˈma.dɪ.xɪl/, /ˈma.nɪ.bɪt/, /ˈwa.rɪ.dah/ and /ˈmɪ.nɪ.jɪl/ respectively; with the heterosyllabic epenthetic vowel and the stress reserved on the first CV syllable.

In summation, the heaviness of the CVC in ALA is not determined solely by its position in the word as other dialects and languages. Its weight is alternatively determined by other information such as the morphological factors. Discussion in relation to the stress assignment procedure in CVC will follow.

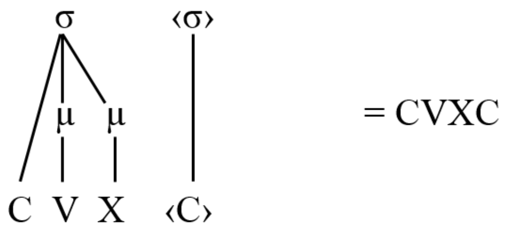
4.1.3. Superheavy CVVC syllables[59]

According to the mora association procedures presented in the literature, a syllable type having either the template CVVC or CVCC is said to be superheavy and exceeding the maximal allowed number of moras in a single syllable being tri-moraic, taking into account the Bimoraicy Constraint that syllables must be maximally bimoraic (Broselow, 1992: 10). The intolerance of tri-moraic syllables in Arabic dialects is evidenced in restricting such syllables to domain-final positions only. In non-final positions both CVVC and CVCC usually undergo resyllabification. Word-finally, both are treated differently in literature. In McCarthy’s (1979a) analysis, a superheavy syllable is actually a heavy syllable plus a degenerate one. Others used the term “extrasyllabic” to analyse a superheavy final consonant

[59] CVCC is discussed to a limited extent as it is not relevant to the dialect under analysis.

being attached to a separate syllable node rather than to a previous syllable (Aoun 1979, Selkirk 1981, Hayes 1979, Kenstowicz 1994, Watson 2002: 58). According to Rialland (1994: 136), “[a]n extrasyllabic consonant is not part of any syllable”. The representation of an extrasyllabic consonant is as illustrated below (X stands for either a vowel in CVVC or a consonant in CVCC).

(4.3) Extrasyllabicity (Watson, 2002: 58)



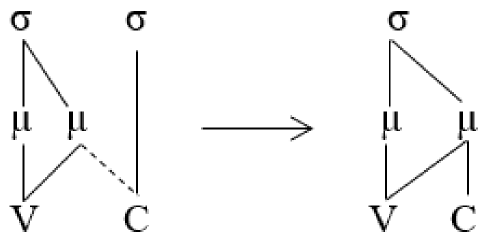
In order to comply with the bimoraicity principle, Arabic dialects follow either one of the two repair procedures to make an unsyllabified non-final segment syllabifyable. The choice of which is dependable on the language-specific parameters. Vowel epenthesis is a repair process that is followed in dialects, for instance Cairene and Iraqi Arabic (for CVCC: *ʔibin* > *ʔibinna*[60] ‘our son’ in Iraqi *kalb* > *kalbina* ‘our dog in Cairene) (Erwin 1963, Mitchell, 1956 Itô, 1986, 1989 and Broselow, 1979), Makkan Arabic (for CVVC: *xaalana* ‘our maternal uncle’, and CVCC: *kalbana* ‘our dog’) (Abu-Mansour, 1987, 1991) and Hijazi Arabic (Al-Mohanna, 1994). Thus, a final C of either CVVC or CVCC is resyllabified according to where an epenthetic vowel is inserted.

In an optimality theoretical analysis, Kiparsky (2003: 159) claims that non-final CVVC surface in VC and C dialects[61] because such languages license internal trimoraic syllables with a final semisyllabic consonant. Watson (2007: 343) claims that other dialects do not allow internal semisyllables although internal CVVC syllable surface in such dialects as middle Egyptian, and some Yemeni and Meccan (Makkan) by claiming that mora dominates two constituents. Thus, she suggests a mora sharing procedure for a CVVC syllable instead, in languages which allow internal CVVC (/beːtna/ ‘our house’ in Iraqi), by making use of Broselow’s (1992: 14-15)[62] Adjunction-to-Mora Rule, that is restricted to CVVC to adjoin the final consonant to the mora of the vowel, represented below:

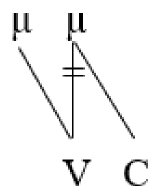
[60]I argue in the current thesis that, in a similar case to Iraqi, the vowel in a word that is originally CVCC in MSA but surfaces as CVCVC in such dialects as ALA is diachronically added. Thus, the insertion of the vowel in /ʔɪbɪn/ in ALA is not epenthetic but is part of the word formation instead.
[61] Classifying Arabic in this way is based on the position of vowel epenthesis in a CCC cluster, having a C, CV and VC dialect types (Kiparsky, 2003).
[62] Also presented in Broselow et al (1995) and Broselow et al (1997).

(4.4) Mora reduction rules (Broselow 1992: 14-15)

(a) Adjunction-to-Mora



(b) Cairene Delinking



Whether to apply Adjunction-to-Mora on the word or the phrase or both levels depends on the language in question since different languages make use of either Adjunction-to-Mora, vowel epenthesis, a delinking rule, or either a combination of each to reduce the number of moras a superheavy syllable has. While epenthesis reduces the trimoraicity of a superheavy syllable to monomoraicity by splitting it in to two light syllables, Adjunction-to-Mora and delinking change it to a bimoraic syllable. According to Broselow (1992: 17), Arabic dialects are divided into three groups according to what level (word or phrase) the repair rules apply. These are as illustrated beneath:

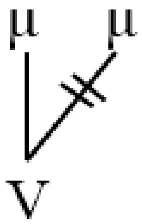
(4.5) CVVC behaviour in Arabic dialects

Group 1	**Group 2**	**Group 3**
CVVC#	CVVC#	CVVC#
CVVC + C	CVVC + C > CVVCVC	CVVC + C > CVCC
Adjunction applies on both levels. Iraqi, Sudanese: *beetna*, *beet salim*	Adjunction applies on phrase level only. Makkan: *xaalana*	Adjunction on phrase level. Delinking on word level. Cairene: *beet salim*, *betna*

Unstressed vowel shortening is another evidence of the intolerance of non-final CVVC. Cairene Arabic is an example of vowel shortening in unstressed non-final CVVC: /bæb/ ‘door’ > /babeːn/ ‘two doors’. Unlike Cairene Arabic, vowel shortening of unstressed long vowels does not occur in ALA as one of the repair processes. Thus, although the vowels in the non-final long syllable in the examples /bæbeːn/ ‘two doors’, /sˤaːħbaːt/ ‘friends, PL. F.’, /ħæʒæt/ ‘things’, /dɪbæbiːr/ ‘wasps’ and /tiːʒæn/ ‘tiaras’, are shorter than those in /bæb/, /saːħbʌh/, /ħæʒah/, /dabbuːr/ and /tæʒ/, they still count phonologically as long, in spite of the fact that they are not stressed anymore. This fact is apparent when comparing the pronunciation of these words to the Egyptian Arabic pronunciations: /bəbeːn/, /sˤʌħbaːt/, /ħəgaːt/, /dababiːr/ and /təgæt/, where unstressed long vowels are shortened for the reason that two long vowels in a single word are not allowed in Cairene Arabic (Watson, 2002: 226-227).

The shortening of the vowel is in fact a process of mora loss as illustrated below:

(4.6) Unstressed long vowel shortening in Cairene Arabic (Watson: 2002: 227)



Recall that CVVC occurs only in final positions in ALA. It never occurs in non-final positions in morphologically simplex words and its existence in morphologically complex words is subject to resyllabification. When a vowel-initial morpheme is added, the last C in a CVVC syllable occupies the onset position of that onsetless morpheme. Consider:

Table 4.4: CVVC + V(C) in ALA

Word	**UR**	**Gloss**
/reː.tah/	/reːt + ah/	saw, 1.SG. him
/ʒeː.bak/	/ʒeːb + ak/	your pocket
/fluː.siː/	/fluːs + iː/	my money
/lɪ.geː.tak/	/lɪ.geːt + ak/	Found, 1.SG. you

Vowel epenthesis is another repair process where the last C syllabifies as the onset of the epenthesised vowel. Compare the words in the previous table to the examples below:

Table 4.5: CVVC and vowel epenthesis in morphologically complex words in ALA

Word	UR	Gloss
/reː.tɪ.ha/	/reːt + ha/	Saw, 1.SG. her
/kɪ.tæ.bɪ.ha/	/kɪ.tæb + ha/	her book
/bæ.bɪkʊm/	/bæb + kʊm/	your, PL. door
/tˤɪ.riː.gɪ.na/	tˤɪ.riːg + na/	our route
/mʊf.tæ.ħɪ.kʊm/	/mʊf.tæħ + kʊm/	your, PL. key

Although it seems that an existent vowel, either epenthetic or from a following morpheme, syllabifies with the final C as its onset. Non-final CVVC are also detected in the dialect. Consider:

Table 4.6: Non-syllabifiable C in CVVC in ALA

Word	UR	Gloss
/zeːt.na/	/zeːt+ na/	our oil
/rɪ.biːʕ.na/	/rɪ.biːʕ + na/	our spring
/ħoːʃ.hʊm/	/ħoːʃ + hʊm/	their house
/bɪ.rɪ.miːl.hʊm/	/bɪ.rɪ.miːl + hʊm/	their barrel
/tˤeːr.kʊm/	/tˤeːr + kʊm/	your, PL. bird

In fact, the examples in Table 4.6 above are optional versions of ones with vowel epenthesis. It is not a geographical or a dialectal variant but can be heard from the same person where the quality of the epenthetic vowel varies according to factors such as speech speed, emphasis or type (connected or not) and moreover, also varies according to the types of the heterosyllabic consonants in relevance to sonority, since the vowel is clearer whenever the distance between the consonants is greater. Therefore, surfacing of internal CVVC will not be considered as the dialect's repair strategy against closed long syllables word internally.

In summary, CVVC can only surface in final positions in ALA with an extrasyllabic final C by adopting the syllabicity approach mentioned above. In non-final positions, the final syllable's consonant is subject to resyllabification as an onset to a following vowel (either epenthetic or onsetless). This can be evidence of the fact that Arabic dialects are maximally bimoraic.

4.2. The syllabification process

Generally speaking, ALA is classifiable as a North African dialect in this respect. Similar to such dialects as Moroccan Arabic, the syllabification direction is right-to-left with right-to-left stress assignments as we will observe soon. To come to such a conclusion we need to examine the wider picture in syllabification, and then look closer to North African dialects concluding with an algorithm for ALA accordingly.

Studies of syllable structure revealed the following principles that languages seem to share in common:

- All languages have syllables with onsets as one of the options of the syllable algorithm of the language (for example, Clements and Keyser' (1983) typology).
- The existence of a closed syllable type implies that of a correspondent open syllable type (Clements (1990: 320).
- Many languages require all syllables to have onsets in surface representation prohibiting vowel-initial syllables since "syllables that lack an onset should be avoided" Itô (1989).
- No language requires all syllables to have codas.

To abstract the language's algorithm of syllabification, some issues such as syllabification of intervocalic consonants and syllabification and syllable weight need to be discussed.

4.2.1. Syllabification of intervocalic single consonants

An intervocalic consonant usually syllabifies as the onset of the second vowel. In his Maximal Onset Principle, Clements (1990: 299 & 316-317) gives the stipulation that in the syllabification process, an unsyllabified segment is adjoined to a following segment if it is lower in sonority, in order that a VCV sequence is better syllabified as V.CV rather than VC.V.

Moreover, the Syllable Contact Law (Murray and Vennemann, 1983: 520) with its extended version (Clements, 1990: 319) provides a device to achieve syllabification of intrasyllabic constituents. Both generally state that preferred adjacent syllable boundaries at the end of the first syllable are higher in sonority than that at the beginning of the second.

It is also mentioned by Clements and Keyser (1983: 37) that "syllable-initial consonants are maximised to the extent that they are consistent with the syllable structure conditions of the language in question" and "subsequently, syllable-final consonants are maximised to the extent consistent with the syllable structure conditions of the language in question." That is, longer consonant sequences require language specific parameters. Thus, the sequence VCCV is either syllabified as VC.CV or V.CCV, although never as VCC.V (Itô, 1989: 222) which also happens across word-boundaries (Harris. 1983).

It is also worth revealing that the syllabification of VCCV is not always the same even in a single language where two options may be ascertained: V.CCV, VC.CV, but not VCC.V. The choice of which, as we know, depends on the language phonotactics where usually word-initial clusters are expected to exist word-internally in the language. Other factors such as the phonetic characteristics of the adjacent consonants (aspirated versus glottalised in English for example) also plays a role in the syllabification process. Moreover, in some languages, some kinds of consonants might strictly require the syllabification to be VC.CV instead of depending on the type of the consonants. Hayes (1989) for example claims that the sequence is better syllabified as $VC_1.C_2V$ if C_1 is 's' and C_2 is oral even though the cluster SCV occurs syllable-initially.

In ALA, where initial consonant clusters are restricted to a few phonological environments, internal CC consonants are always syllabified as heterosyllabic as we observed in Chapter Three. Internal Vowel-initial syllables never exist in ALA which implies a VCV sequence to syllabify as V.CV obeying the core syllable principle called by Itô the "Principle of CV-Precedence", which states that a consonant immediately preceding a vowel is universally an onset (1986: 164).

4.2.2. Syllabification of peripheral segments

Syllable peripheral consonants are subject to resyllabification with adjacent constituents when they exist. This is the position where phonological processes such as vowel epenthesis apply as a result of morpheme concatenation and speech connection. Extrasyllabicity and extrametricality are used to explain how final consonants are treated as regard to moraicity where an extrametrical constituent is moraic, while an extrasyllabic is not. Both devices have been discussed before and will be looked at again in connection with stress.

The first consonant in an initial cluster is also resyllabifyable with pre-incoming constituents that are either epenthetic vowels in words such as: /xsor/ ~ /ɪxsor/ 'lost, 3.SG.M.', or vowels from pre syllables (in connected speech): /xuːðɪbriːħah/ 'take, 3.SG.F with little …'

4.2.3. Syllabification of geminates

"Geminates" in phonology refers to consonant doubling or length[63]. Its existence in some languages (such as Japanese, Italian (phonemic) and Spanish (phonetic)) is contrastive, whereas it is not in others (English and French, for example). The examples below show the

[63] Referring to geminates as "long" would disappoint some phonologists since the duration difference between single consonants and geminates is proven to be different (cf. Idemaru and Guion, 2008). Delattre (1971) argues that while geminates have two phases of articulation, long consonants do not.

contrast between singleton and geminates including but not limited to the languages mentioned below.

(4.7) Singletons vs. geminates minimal pairs in different languages

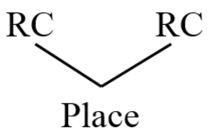
Japanese:	/kata/ ‘frame’ vs. /kata/ ‘bought’ /hato/ ‘dove’ vs. /hatto/ ‘hat’	Kawahara (2015: 1)
Spanish:	come nueces ‘s/he eat walnuts’ vs. comen nueces ‘they eat walnuts’	Scarpace and Hualde (2013: 1)
Italian:	fato ‘fate’ vs. fatto ‘done’	Davis (2011)

In a CV-representation, geminates are considered monosegmental and assigned to two x-slots compared to singletons that are assigned to a single x-slot, as illustrated below:

(4.8) Prosodic length analysis of geminates (Davis, 2011: 838)

This contrasts with Selkirk (1990), where geminates are rather bisegmental as underlyingly long and represented by a sequence of CC that are represented by two root tiers instead and therefore syllabification and “moraification” of geminate constituents are achieved by general principles and rules in the grammar of individual languages making use of Hayes’ (1989: 258) Weight-by-position rule, stated before in this thesis. In assigning the geminate to two root nodes, several phonological processes are captured where an underlying geminate such as that in /kappi/ ‘hero’ is recognised as /kahpi/ in Icelandic. The representation of geminates in Selkirk’s two-root theory is represented beneath:

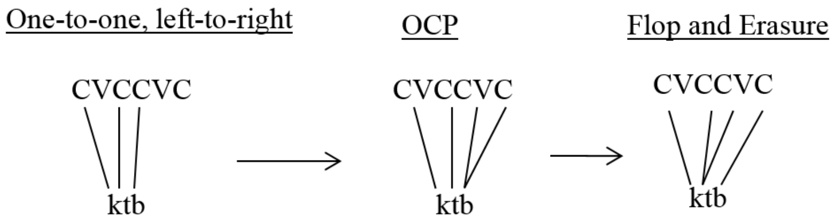
(4.9) Two-root theory (Selkirk, 1990: 126)



The moraic approach is adopted for ALA as word-final vowel insertion would split a final CC in diachronic CVCC nouns and vowel epenthesis, to verbs ending with an initial-consonant suffix; however, it would not split final words geminate constituents.

In a prosodic representation, where one-to-one mapping is required for the autosegmental representation of word formation as we saw in Chapter One, the geminates are problematic in Arabic and are subject to the Obligatory Contour Principle OCP which prohibits the association of adjacent identical constituents (McCarthy, 1986: 208, 209). To solve this problem, McCarthy adopted an erasure rule to account for gemination stated in 4.8 above and represented below:

(4.10) Gemination in prosodic morphological analysis

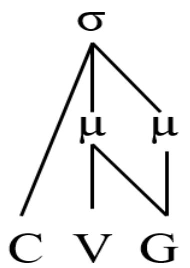


As mentioned in §3.6 above, in a moraic approach, geminates are different from singletons in that while singletons are underlyingly light, and consequently non-moraic, geminates –similar to vowels- underlyingly bear a mora (Hayes, 1989:256). This is illustrated in Watson’s hypothetical form underneath:

(4.11) Moraicity and geminates (heterosyllabic) (Watson, 2002: 52)

Whereas, when tautosyllabic geminates, besides its own mora, it shares the mora of the preceding vowel as represented below:

(4.12) Tautosyllabic geminates (Watson, 2007: 352)



In ALA, both types of geminates (the root and those which merge as a result of concatenation and word formation) behave in the same way with regard to syllabification and stress assignment. Thus, as is discussed in Chapter Two, geminates exist in word initial, medial and final positions originally in the coda position with the second part of the geminate to be ready to parse to the following empty onset.

Two properties of geminates are argued for in the literature; the first is the geminates' resistant to vowel epenthesis: "geminate integrity"; the second refers to the observation that geminates are resistant to phonological rules, for example spirantization in Tiberian Hebrew; "geminate inalterability". (Davis 2011: 844)

In ALA, epenthesis does not apply to break up geminates; however, it occurs after the geminate so that the two halves of the geminate syllabify as heterosyllabic. This also implies that degemination (in the sense of consonant deletion)[64] does not occur in such cases and consequently, ALA is different from TLA for example, in this respect. Consider the following comparison between ALA and TLA:

[64] Which is obviously different from the degemination process as being a process of geminate shortening (i.e. losing sharing the mora with the preceding vowel) (cf. Rakhieh, 2009: 265-266)

Table 4.7: Gemination, ALA vs. TLA

ALA	TLA	UF	Gloss
/dazzɪlah/	/dazlah/	/dazz + lah/	sent, 3.SG.M, to him
/gaðˤðˤɪha/	/gaðˤha/	/gadˤdˤ + ha/	unscrewed, 3.SG.M it, F.
/ħatˤtˤɪhʊm/	/ħatˤhʊm/	/ħatˤtˤ + hum/	put, 3.SG.M. them

However, in some situations, words such as: /ħagna/ 'our rights', /rabna/ 'our God', /ʃadna/ 'held, 3.SG.M. us' and /laflah/ 'wrapped, 3.SG.M for him' might be heard as an influence of TLA. Such examples should be pronounced as /ħaggɪna/, /rabbɪna/, /shaddɪna/ and /laffɪlah/ instead in ALA.

Adding a vowel-initial suffix retains the geminates in both dialects though. Consider:

Table 4.8: Gemination retention in both ALA and TLA

ALA	TLA	UF	Gloss
/dazzah/	/dazzah/	/dazz + ah/	sent, 3. SG. M, him
/gʌðˤðˤah/	/gʌdˤdˤah/	/gʌdˤdˤ + ah/	unscrewed, M.SG., it, M.SG.
/ħʌtˤtˤah/	/ħʌtˤtˤah/	/ħʌtˤtˤ + ah/	put, M.SG., them

CVVG would appear problematic in a dialect that is claimed to block trimoraic syllables. According to Watson's tautosyllabic analysis of geminates a CVVG would be considered a super-super heavy syllable. Following Rakhieh (ibid: 269) such syllable forms do not exist in Arabic and words such as the Ma'ani Arabic words: /zætt/, /ʃædd/ and /mædd/ in fact surface as a result of vowel deletion from the inputs: /zætɪt/, /ʃædɪd/ and /mædɪd/. While the first list of forms exists in dialects such as Ma'ani Arabic, the second list of forms exists in other Arabic dialects word-finally, for example in Palestinian Arabic (Abu-Salim, 1982) and word-medially in Ajluuni Arabic (Abu-Abbas, 2003).

In ALA, a similar case where final geminates seem to appear, as in CVVG, they only exist on the surface. Consider the examples below:

Table 4.9: Surface geminates in ALA

Word	+ V(C)	+ CV(C)
/dæzz/	/dæzzah/	/dæzha/
/gɑːðˤðˤ/	/gɑːðˤðˤah/	/gɑːðˤhʊm/
/ħɑːtˤtˤ/	[ħɑːtˤtˤah/	/ħɑːtˤhʊm/

Similar to Rakhieh's analysis, the CCs are in fact not geminates but are sequences of two identical consonants. They have the inputs /dæzɪz/, /gɑːðˤɪðˤ/ and /ħɑːtˤɪtˤ/ with accidently identical consonants. In MSA, this is called Form I AP (active participle) which has the structure CaaCiC (faaʕil) and is merged from Form I of the triliteral verb. (Ryding, 2005: 103). Other Form I AP examples with no identical final CCs are: /rægɪd/ 'asleep', /wɑːsˤɪl/ 'arriving', /ʃæjɪf / 'seeing'.

4.2.4. The Core Syllabification Principle (CSP)

By providing a principle of syllabification making use of the sonority hierarchy, Clements (1990) refers to those syllables which conform to it as "unmarked"[65] whereas those which do not conform are noted to be "marked" syllables. In her discussion, Watson (2002: 63) makes use of extrametricality under a moraic analysis. The following algorithm that is adapted from Clements and Watson implying a right-to-left syllabification:

(4.13) The Core Syllabification Principle (CSP) (Clements, 1990: 299, 317 and Watson, 2002: 63).

a. Apply consonant extrametricality where is needed: C >⟨C⟩ /___] word.
b. Associate syllabic constituents to a mora node.
c. Associate remaining moraic segments to a syllable node.
d. Given P (an unsyllabified segment) adjacent to Q (a syllabified segment), if P is lower in sonority rank than Q, adjoin it to the syllable containing Q (taking into consideration the Maximal Onset Principle and the Dispersion Principle in syllabifying the string VCV as V.CV rather than VC.V.
e. Adjoin moraic R to the syllable containing Q (iterative).

Moreover, according to her assumption mentioned under §4.1.1 above, Zec provides a constraint where, in two successive moras, the sonority of the first must be higher than or equal to that of the second. Thus, in a non-final CVC the last C would lose its mora if it is followed by a mora that is of higher sonority than it is. That is to say, in a sequence for example such as CV_1CV_2, the C in the middle is expected to lose its mora as it is less sonorous than V_2. Consequently, in the following two English words 'l' is moraic in the first, whereas it is not in the second. Consider:

[65] By being unmarked, Clements (1990: 303) means any syllable which shows "a steady rise in sonority from the margins to the peak."

(4.14) moraic and non-moraic segments in English: (Zec, 1995: 92)

a. μμ
   | |
   b e ll

b. μμ
   | |
   bellicose

Accordingly, languages may choose to apply the possibility that “unmoraified” consonants are optionally attached to the preceding syllable having a non-final light CVC.

4.2.5. Directionality in syllabification

The idea of directionality for Arabic dialects was first pointed out by Itô (1986, 1989) followed by Farwaneh (1995) to account for the difference in the position of vowel epenthesis in CCC between Arabic dialects. Although, as noticed in the literature, the syllable template for both Egyptian and Iraqi Arabic is the same (which is CVC), these two dialects are different with regard to the position of the vowel epenthesis to break up a CCC string. Egyptian Arabic tends to epenthesise as in CCiC, whilst Iraqi Arabic epenthesise occur as CiCC. This difference, as we will see later, is captured by directional syllabification.

Kaye and Lowenstamm’s (1981:306-11) principle for directionality is that “syllabification is directional and can take place from right to left in some languages and from left to right in others”. In her study including a comparison of two Arabic dialects, Itô (1986:164) claims that the principle of directionality related to the prosodic approach corresponds to the ordered rules in the rule-based approach. Her claim is built on the idea that the principle of directionality as a parameter of syllabification results in the same result as the ordering between onset and coda rules. In doing so, she tries to demonstrate that it is directionality that makes two similar dialects as Iraqi and Egyptian differ in the place of epenthesis. In a template-based approach, this can be encoded into a condition referred to by Itô (1986:165) as the “Universal Core Syllable Condition (UCSC)”, which stipulates that the sequence CV must be tautosyllabic.

The fact that directionality is parametric is demonstrated in Noske’s (1988: 49-57) study of three languages; Klamath[66], Yawelmani[67] and Tigrinya[68] where the first two languages syllabify from right to left (as argued for Klamath in Ter Mors, 1985: 316 and for Yawelmani in Noske, 1985: 347) while the last one occurs from left to right. In his analysis, not only is

[66]A Penutian language of Oregon (Noske, 1989: 49).
[67] A Penutian language that is spoken in South Central California (Ibid: 51)
[68] South Semitic language of northern Ethiopia (ibid: 56)

epenthesis accounted for by using the directionality parameter but also other phonological processes, for instance vowel elision and shortening in a language such as Yawelmani.[69]

Using McCarthy and Prince's (1993) "Generalized Alignment" that "[t]he right edge of the root must be aligned with the right edge of the syllable", Boudlal (2009: 69-75) claims that a right-to-left syllabification is used to account for the directional syllabification in Casablanca Moroccan Arabic (CMA). In so doing, Boudlal provides a justification of the surfacing of √/k-t-b/ as /ktəb/ rather than /kətb/ 'wrote, M.', taking into consideration the optimality factor to optimise /ktəb/ over /kətb/ that follows from the dialect's stress system.

ALA also syllabifies from right to left. Evidence can be obtained from the fact that ALA is a dialect that epenthesises between any internal CC string either heterosyllabic or tautosyllabic instead of simply assigning the first consonant to the coda of the preceding syllable. Thus, /tɪʒriː/ 'run, F.', the /ʒ/ is syllabified with an epenthetic vowel rather being attached to the syllable /tɪ/. This and such examples are dealt with in the following section.

4.3. Syllabification in ALA

Undoubtedly, the syllabification process correlates with stress assignment parameters in a given language and the language phonotactics. Thus, applying the CSP (in 4.13 above) to the extent ALA allows, taking into consideration syllable weight in addition to the dialect phonotactics mentioned in Chapter Three, ALA follows the following procedures.

(4.15) The syllabification algorithm of ALA

(a) Associate syllabic constituents to the mora node.
(b) From right to left, assign CvC to any unsyllabified CC cluster where v is an epenthetic vowel associating mora to it.[70]
(c) Associate any moraic segments to the syllable node.
(d) Associate a single pre-vocalic consonant to the onset of the vowel on its left.
(e) Associate remaining consonants to the vowel on its left.
(f) Apply final consonant extrametricality; to the last C in final CVC syllables in non-suffixed verbs and similar nouns (with no mora).
(g) Adopting 4.14 and 4.15 above, geminates are tautosyllabic utterance-finally and heterosyllabic utterance-internally and are thus syllabified so.

The previous algorithm in exemplified in 4.16 underneath:

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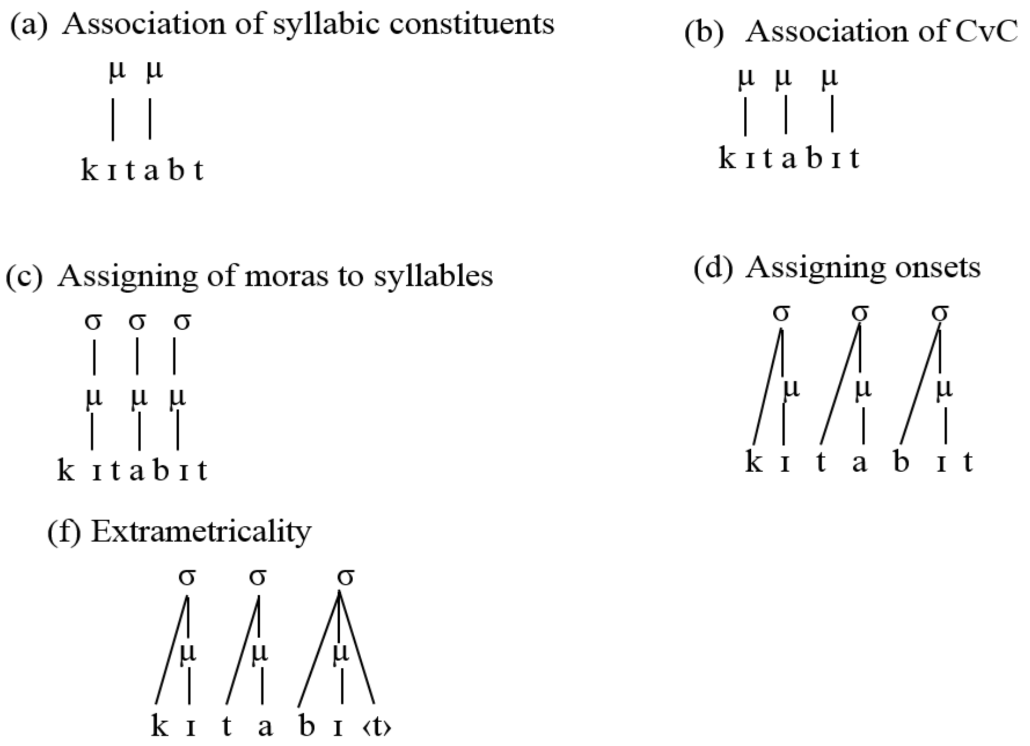
[69] For brevity due to space restrictions, the reader can refer to Noske (1987) and (1989) for examples and complete discussion.

[70] Boudlal (2001: 43).

(4.16) Core syllabification, exemplifying /kɪtabt/ ‘I wrote’ in ALA

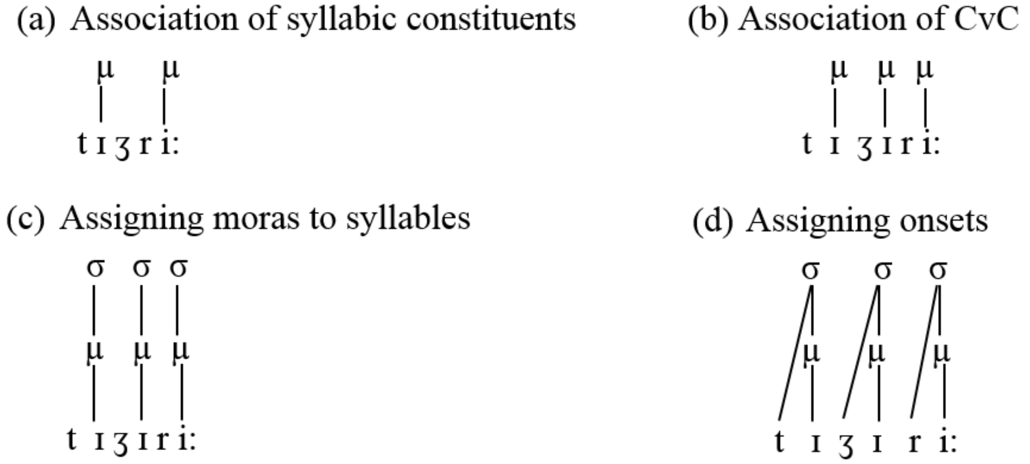


The previous algorithm is a simple procedure to account for the syllabification process where the core CV is the mostly preferred internal syllable type and closed syllables only exists peripherally.

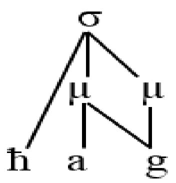
In the following examples, the above algorithm is applied to words that contain internal epenthesis.

(4.17)

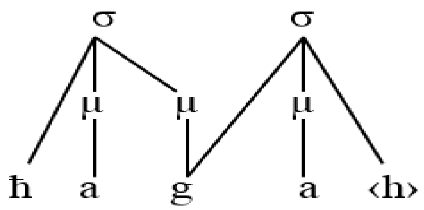
1) Syllabification of /tɪʒri:/ ‘runs, F.’



2) Syllabification of [ħagg] ‘rights’



3) [ħaggah] ‘his rights’



4.4. Stress assignment

Arabic dialects differ from one another in stress-assignment parameters due to the wide geographical diversity. Thus, each dialect has its own specific stress parameters despite the fact of the existence of some general similarities. More similarities can be established amongst the North African dialects. The current study is an addition to the expanding research concerning the controversial status of Arabic word stress as this dialect has never been analysed before.

4.4.1. Stress assignment in Arabic

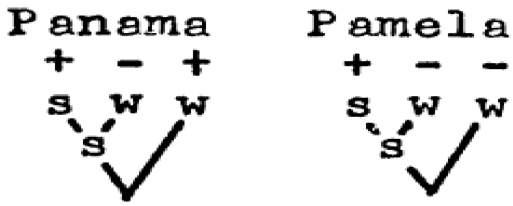
Early traditional grammar analyses by Arab philologists do not consider stress and stress assignment in spite of the fact that it exists in MSA and Arabic dialects (Cadora, 1989: 265). However, in the last few decades researchers have started to provide analyses of it under different theoretical approaches. We will notice under this section a brief review of the literature which dealt with Arabic stress in MSA, in addition to Arabic dialects using the metrical theory.

In Arabic, in words that contain only two syllables, only main stress is demonstrated while secondary stress may be discovered in longer words (and sometimes optionally in two syllable-words in some cases in some dialects). Mitchell (1960), Broselow (1976), McCarthy (1979a) and Hayes (1979, 1981 and 1995), for example, provide analyses for Cairene and MSA stress rules in some kind of comparison in many cases. The algorithms they provide for stress assignment are all built on the classification of Arabic syllables as - light: CV and final CVC, - heavy: CVV, non-final CVC, and superheavy: CVVC, CVCC and CVVGG.

Although in some cases the morphological structure of the words is considered in stress assignment, there seems to be no in-depth morphological analysis provided for Arabic stress. In her analysis of stress assignment rules in Cairene and San'ani Arabic, Watson points to the morphological effect on stress assignment in various situations. Thus, she (2002:80-81) indicates the morphological effect as being an exception to the Cairene stress algorithm, when she considers Abdel-Massih's (1975: 26) examples where a penultimate syllable always receives stress in the third person feminine singular inflectional form of the perfect verb when a V(C) suffix is added: /raˈmɪtʊ/ 'she threw it M.'. In such a case, the stress shifts from 'ra' in *ramit* to 'mi' in *ramitu*. A similar stress assignment is also noticed in a plural with the template CiCiCa or CuCuCa: *ɣiriba* 'crows' and *subuʕa* 'lions' (Broselow 1976: 13-14).

Based on Liberman's (1975) findings, metrical theory was first established by Liberman and Prince (1977) to provide a hierarchical analysis for English stress. Accounting for stress in this theory makes use of binary branching trees pairing sister nodes that are labelled with S W in whatever sequence, depending on which stress is stronger than the other, in view of the fact that the stressed syllables are dominated with S and unstressed syllables with W. Stressed and unstressed syllables are accounted for by using the binary feature [± stress] which is retained from previous stress theories making use of the binary feature from the SPE (1968). While strong syllables receive a stress, weak syllables do not. Figure 4.20 below explains this procedure.

(4.18) Binary assignment of stress in Metrical theory (Hayes, 1981: 9)



To widen the meaning of the prominence concept, the use of [±stress] was later excluded from the representation and the "foot" node was alternatively introduced (Prince, 1975 & Selkirk 1980). Using the same theoretical framework, a universal account for stress is provided by Hayes (1981).

4.4.2. Extrametricality and stress assignment

In Hayes' analysis of stress, bounded feet are binary as they contain a maximum of two syllables and are either iambic (having the sequence W S)[71] or trochaic (having the sequence S W). A marginal segment that is stress resistant and therefore, non-moraic, is said to be extrametrical, as extrametricality makes the final constituents invisible for stress assignment and therefore fails to gain weight by position, as required by Hayes' 'Weight-by-Position" rule that is previously mentioned. Thus, extrametricality treats a heavy syllable as non-heavy by applying the "final segment extrametricality rule".

As reviewed before, extrametricality is a device that is used to identify domain-final light constituents to account for the stress assignment procedure in a given language. Hence, for example, the difference between light and heavy CVC syllable types is that of the final C being extrametrical or not. Hayes provides the following rule for extrametricality.

(4.19) The final segment extrametricality rule (Hayes 1981: 229)

$$[\,+\text{seg}] \rightarrow [+\ \text{ex}]\ /\ \_\_\_\_\ ]_{\text{word}}$$

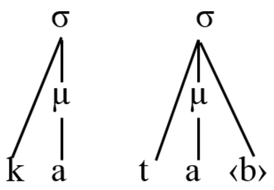
The identity of 'seg' can be a mora (as in Arabic), or a whole syllable -as in Hopi- (Hayes, (1981: 230-231) and Jeanne (1978)).

In MSA, in addition to some Arabic dialects, such as Cairene and San'ani Arabic, where CVC attracts stress word-internally but resists stress assignment in word final positions,

[71] W and S stand for weak and strong respectively.

extrametricality provides a straightforward analysis where this C is excluded in this stage of analysis. Thus, extrametrical segments are syllabified in this stage but are attached immediately to the syllable node as they are invisible to Hayes' 'Weight-by-Position' rule mentioned in Chapter Four. The example below shows the process where the angled brackets represent extrametrical constituents.

(4.20) Moraic representation of extrametricality (Watson, 2002: 57)



4.4.3. Stress parameters in ALA

As we have already indicated, syllables fall into three categories in terms of their weight in ALA: light (CV), heavy (CVC, CVG, and CVV), and superheavy (CVVC and CVVG). However, it should be stressed that syllable weight and position are not the only stress assignment determinants in ALA given that the word category (i.e., the morphological information) as well as rhythmic grouping (Watson, 2011: 19) play a crucial role in stress placement in this specific dialect. Such morphological influence can be detected when drawing a comparison of stress assignment between final and non-final CVCs. In some cases, final CVC can attract the main stress as clearly seen in Tables 4.1 and 4.2.

The main reason behind this variance of stressing the final CVC can be accounted for with reference to certain processes. In detail, each word in ALA has one main stress to lodge on one particular syllable. Stress may be assigned to the ultimate, penultimate or antepenultimate syllables. To begin with, in trisyllabic words and above:

a. The main stress falls, to a large extent, on the last syllable if (and only if) the last syllable is superheavy (i.e., CVVC and CVVG).
b. If the final syllable is not superheavy, the stress falls on the penult if it is heavy.
c. Otherwise the stress dwells on the antepenult.

Consider Table 4.10 below:

Table 4.10: stress assignment patterns in ALA (L= Light, H= heavy, and S= Superheavy)

Word	Syllables	Stress position	Gloss
bɪn.dɪ.gæt/	HL**S**	ultimate	gun
/ɪl.bæ.buːr/ /lɪm.meː.mæt/	LH**S**		the coach the mothers
/ʒæ.bæ.tah/ / /max.tuː.ba/	H**H**H	penultimate	brought, 3.SG.F. it, M.
/mɪ.ruth.tiː/	L**H**H		became ill, 2.SG.F.
/rɪ.tiː.hum/	L**H**H		saw, 2.SG.F. them
/mɪ.liː.ħa/	L**H**L		beautiful, F.
/sɑː.dɪ.gɪ.tak	H**L**LH	antepenultimate	became, 1.SG. your friend
/ma.rɪ.tak/	**L**LH		your wife
/mʌsˤ.tɪ.rɑː.tɪ.hʊm/	HL**H**LH		their rulers

As a result of this algorithm, superheavy syllables (i.e., CVVG and CVVC) have the priority in attracting the main stress with final CVVC over internal CVVG. Furthermore, syllables with shapes CVG and CVV are of a second priority in attracting the main stress to dwell on them. Additionally, both syllable structures CV and CVC behave in a similar fashion in relation to the stress assignment, most notably in disyllabic words where other information controls the process of stress assignment. However, depending on the data surveyed, it should be mentioned that there are two major observations pertaining stress assignment in ALA. Firstly, syllables with epenthesised vowels are not stressed whatsoever. Secondly, dependent morphemes attached to a given word are stressed providing that they contain a long vowel and there is no any other existing syllable (in the given word) more legitimate to attract the main stress, viz. there is not an ending with regards to the superheavy syllable.

As is evident in Tables 4.1 and 4.2 above, CVC syllables behave differently in ALA. In some cases, word-initial CVCs are stressed. As hinted at above, the lexical category of the word plays a crucial role in stress assignment. Hence, verbs are expected to have the rightmost syllable of the stem stressed. Such examples of those mentioned in Tables 4.1 and 4.2 above include the masculine singular verb past forms. See below:

(4.21) Final stressed CVC in ALA

/ʃɪˈrʌb/ ‘drank, 3.SG.M.’
/xɪˈbʌz/ ‘baked, 3.SG.M.’
/sˤɪˈrʌf/ ‘spent, 3.SG.M. money’

This amounts to saying that it is important to differentiate between two types of verbs’ concatenating morphemes: those which are attached to a word and those which are part of the word. As for the former, they include those morphemes which have one of the dependent pronouns attached to them. As for the latter, they include feminine formation morphemes which are deemed to be part of the word formation. Consider the following data:

(4.22) Stress assignment to disyllabic feminised verbs in ALA:

/rɪˈmɪt/ 'threw, 3.SG.F.’
/gɪˈrɪt/ ‘read, 3.SG.F.’
/ʕɪˈmɪt/ ‘became, 3.SG.F. blind’
/zɪˈgɪt/ ‘screamed, 3.SG.F.’
/ʃɪˈfɪt/ ‘recovered, 3.SG.F.’

These are originally formulated from the masculine forms: /rɪˈmɑː/, /gɪˈrɑː/, /ʕɪˈmɑː/, /zɪˈgɑː/ and /ʃɪˈfɑː/, respectively. In all of these words, the final heavy syllables received the main stress. Conversely, the following verbs are stressed syllable-initially.

The definite article –al (recognised as ‘il’ in ALA) does not attract the main stress when prefixed to the word. Thus, this article is not considered a stress-bearing unit. See the following examples:

(4.23) The definite article –al and stress assignment in ALA:

a. /ˈkalɪb/ – /ɪlˈkalɪb/ ‘dog’.
b. /aˈmiːra/ – /laˈmiːra/ ‘princess’.
c. /θalˈlæʒa/ – /ɪθθalˈlæʒa/ ‘fridge’.
d. /ˈmɪr.tɪ.ka/ – /ɪl.ˈmɪrtɪka/.
e. /wʊ.ˈɣʌf/ – /ɪl.wʊ.ˈɣʌf/ ‘communicable disease’

The definite article *al* is not involved in the computation of stress, as can be seen in the examples here, where stress on the word following the definite article is identical to stress on the word in the absence of the definite article. A reasonable explanation for this is that the definite article is simply a clitic and does not attract stress nor affect stress assignment to the word with which it is associated.

Nouns having a similar syllable structure to those presented in (4.22) above behave in a similar way. These words have the underlying syllable template CVCVC, as the second vowel is not epenthesised due to the assumption advanced in in Chapter Three above that MSA CVCC are recognised as two syllables: CV.CVC.

(4.24) bisyllabic un-suffixed nouns stress assignment in ALA

/mɪˈtˤʌr/ ‘rain’
/sɪˈlaf/ ‘loan’
/mɪˈʃan/ ‘dried skin’

Now consider the examples in (4.24) below where final CVC syllable is unstressed:

(4.25) Final unstressed CVC 1st singular dependent morpheme in ALA

/ˈrɪ.fɪt/ ‘missed, 1.SG.M.’
/ˈgʊ.lɪt/ ‘said, 1.SG.M.’
/ˈʕɪ.mɪt/ ‘swam’
/ˈmɪ.tɪt/ ‘died, 1.SG.M.’
/ˈʃɪ.fɪt/ ‘saw, 1.SG.M.’

These verbs are originally derived from the monosyllabic stems: /rɑːf/, /gɑːl/, /ʕæm/, /mæt/ and /ʃæf/, respectively.

Stressing the first syllable in the morphologically simple words in (4.24) above, while stressing the second in the morphologically complex words in (4.26) despite the fact that they have exactly the same syllable structure (i.e., CVCVC). This being so, we can claim that the morphological information of a given word plays a principled role in stress assignment in ALA since stress is prone to the lexical identity (category) of the word receiving it. By the same token, it can be suggested that in words with CVCVC, the second heavy syllable (CVC) is stressed because the first syllable (CV) consisting of its own degenerate foot is extrametrical; hence, the only syllable available to assign the main stress to is the final CVC. This brings us to the reason why the CVC syllable is not stressed in CVCCVC or CVCCVCVC where there is no extrametrical foot and stress assignment, as a result, the same rules in the algorithm above are designed for trisyllabic words or above.

In a related vein, an interesting observation is that nouns originally derived from the MSA CVCC and diachronically changed to CVCVC never have the stress on the second syllable, such as the following examples below:

(4.26) CVCVC nouns originally derived from MSA CVCC

/ˈwɪtɪr/ ‘cord’
/ˈʕʊmʊr/ ‘age’
/ˈbʌħɪr/ ‘sea’
/ˈwarɪd/ ‘flowers’

At face value, although there is no solid evidence that the second vowel is epenthetic, such nouns merged from the MSA’s CVCC words, and hence, they are considered diachronically related and as a result influenced (see related discussion in Chapter Three).

A similar claim can be argued to capture the difference between the verbs in 4.24 and those in 2.26. The difference between /ˈʃɪ.fɪt/ ‘I saw’ and /ʃɪ.ˈfɪt/ ‘recovered, 3.SG.F.’ can be accounted for assuming that /ˈʃɪ.fɪt/ is underlyingly /ˈʃæf-t/ > /ˈʃɪf-t/ and is pronounced without the epenthetic vowel in MSA and other Arabic dialects for instance Egyptian as /ʃʊˈft/ having the structure CVCC. While the vowel is counted an epenthetic in ALA as we saw in Chapter Three, this epenthetic vowel does not receive the word’s main stress as claimed previously, and consequently, has the first open short syllable stressed, instead.

Disyllabic words with other suffixed dependent pronouns have the main stress resided on the initial syllable. In addition to the examples presented in Table 4.2 above, more examples are mentioned below, including initial syllables other than CVC[72]:

(4.27) Bisyllabic words with suffixed dependent pronouns
/ˈbɪtna/ ‘stayed, 1.PL. over night’
/ˈlʊmtɪ/ ‘blamed, 2.SG.F.’
/ˈħʌtˤtˤɪt/ ‘put, 3.SG.F.’
/ˈlæðɪt/ ‘turned, 3.SG.F. around’
/ˈbɪntʊm/ ‘appeared, 2.PL.’

According to the dialect algorithm mentioned earlier, in the following examples the heavy syllables are stressed regardless of their position in a word.

[72] Note that all bisyllabic words with the second being a suffix, the initial syllable is not smaller than a CVC. The reason is because, for the minimality requirement, the unsuffixed words should neither be a CV or a CVC. Suffixed words with initial CVC must have originated from monosyllabic CVV, CVCC, CVVC or CVG words.

(4.28) Heavy syllables stressed in ALA

/ˈʒænɪ/ ‘came, M.SG. to me’
/ʒɪˈniː/ ‘Libyan dinar’
/mʊnˈħʌtˤtˤ/ ‘low-graded’
/mahˈnæʃ/ ‘non-existent’
/ʃædˈdiːn/ ‘holdng, PL.’
/ʕabˈbiːh/ ‘fill it!’
/ˈlaffɪt/ ‘wrapped, F.’
/ˈlæga/ ‘met, M.’
/lɪˈgæ/ ‘found, M.’

In bisyllabic words, CVVC (which is always final in ALA) attracts the main stress even if it is preceded with a CVVG syllable. Consider their relative behaviour in the following examples:

(4.29) CVVC and CVVG in ALA

/ħɑːtˤˈtˤɑːt/ ‘putting, 3.PL.F.’
/ʒæfˈfæt/ ‘dry, 3.PL.F.’
/sˤɑːbˈbɑːt/ ‘pouring, 3.PL.F.’

Strictly speaking, there is a considerable tendency in longer words to stress the penultimate if it is heavy even if the same word contains a syllable of equal heaviness. CVV and CVG which are claimed to be equal with regard to their weight are compared below so as to determine the preference so as to stress the penultimate as revealed below.

(4.30) CVV vs. CVG stress assignment in ALA

/ˈħɑːtˤtˤʌ/ ‘putting, 1.SG.F. it, M.’
/ħʌtˤˈtˤeːta/ ‘put, 1.SG.F. it M.’
/mkabbeˈræta/ ‘growing, 3.SG.F it, M.’
/ʒæˈbɪt.ta/ ‘pulling, 1.SG.F. it, M.’
/ʒæˈbɪt.ha/ ‘brought, 3.SG.F. it, F.’

In these examples it is apparent that the penultimate heavy syllable is stressed in both CVV and CVG types. The existence of any type in the same word does not affect the stress assignment. Additionally, there is a considerable inclination to assign the primary stress on the second syllable from the left provided that it is not epenthetic and if the penultimate is light in a word that is longer than bisyllabic when the final syllable is not heavy. Further examples are mentioned below to explain the different instances with the underlying form when there is epenthesis:

(4.31) Stress assignment in long words in ALA

/mɪsˈtˤɑːgɪð/ ‘awake, M.SG.’
/mɪtɪˈmallaħ/ ‘suffering, M.SG.’
/jɪˈhaddɪd/ ‘threatens, M.SG.’
/ʒæˈbɪtlah/ ‘brought, 3.SG.F. to him.
/ʃæfɪtˈhæli/ ‘saw, 3.SG.F. it, F. for me’
/tɪrajˈjaħti/ ‘relaxed, 2.SG.F.’

If the penultimate syllable is light or epenthetic, the heavy antepenultimate syllable is stressed, instead.

(4.32) Antepenultimate stressed syllables in ALA

/ʒæ.ˈbɪt.la.ha/ ‘brought, 3.SG.F. to her’
/mɪn.ˈtˤɪr.ħah/ ‘lying, 3.SG.F. down’
/mɪt.ˈʕaf.lɪgah/ ‘angry, F.SG.’

In all cases, when the final syllable is superheavy, it is stressed:

(4.33) Stressed final superheavy syllables

/bɪkæ.ˈkiːʃ/ ‘dumbs’
/nɪfasˤˈnɑːh/ ‘halved, 1.PL. it, M.’
/mɪtɪgæbˈliːn/ ‘facing each other’
/ħɑːtˤˈtˤɑːt/ ‘putting, 3.PL.F.’

Note that the last example above contains two successive superheavy syllables; these are CVVG (syllabified as CVVC.C) and CVVC. The final CVVC is stressed though.

On the basis of the data analysed here, we are in position to assume that ALA is a trochaic dialect where the feet are left-headed. The compelling evidence for this assumption is that in all trisyllabic words (or above) where the last two syllables are heavy, the penult is stressed rather than the final syllable (i.e., **H**H). If ALA is iambic the last syllable must be stressed, instead (i.e., H**H**). To sum up, stress assignment is weight-sensitive in trisyllabic and even longer words in ALA. Final superheavy syllables are stressed regardless of the structure of the rest of the word. The main tendency is to stress the antepenultimate if no heavier syllable exists in the word even with equally heavy syllables. However, the antepenultimate is not stressed if it is epenthetic, or if there is a heavier syllable in the word.

As we noted in the bisyllabic words, stress is sensitive to the morphological information (word category) regardless of the syllable weight. Syllables with epenthetic vowels are not stressed whatsoever. It seems that ALA exhibits some aspects of opacity when assigning the main stress. There is interaction of both syncope and epenthesis when deciding upon which syllable must be stressed. However, it is beyond the bounds of this thesis to work out this point since it detracts from the main aims of this descriptive research, leaving this issue open for further research to tackle with. Note that although it is beyond the scope of this study, some interesting questions arise concerning opacity. In particular, syncope and epenthesis in ALA conspire to create surface opacity with respect to stress assignment.

Having reached the point where syllable types and distribution are identified and stress assignment is revealed, there is a need at this point to examine the trigger behind the syllable repair processes. The following few sections discuss the major syllable repair processes that exist in ALA. These processes include: vowel epenthesis, syncope and lengthening. For reasons of space, other processes considered previously, such as degemination, glottal stop epenthesis, and glottal stop loss and a few others will no longer be tackled therein.

4.5. Phonological Processes in ALA Syllabification

Phonological processes that are discussed in this thesis are primarily those which the dialect follows as a procedure of resyllabification repair of non-syllabified constituents. In Chapter Two we saw two phonological processes that have reasons other than the repair of syllables. Thus, these will not be included here. The major processes to be discussed include: vowel epenthesis, deletion and lengthening. Shortened vowels that are claimed to occur in LA in other studies (such as Aurayieth, 1982 and Gaber, 2012) are not considered short in the current study. The reason is that, although such vowels feel shorter in some phonological environments, they are still considered long phonologically. Thus, adding a final CVVC morpheme to a word that contain a long vowel such as /ˈbæb/ ‘door’, would still retain the long vowel which loses its stress as a result of syllabification and stress shift: /bæˈbeːn/ ‘two doors’.

4.5.1. Vowel epenthesis

Vowel epenthesis in its general reference in a phonological analysis refers to the insertion of a vowel in the middle or at the end of clusters where an unsyllabified consonant that cannot be parsed with adjacent syllables, is syllabified with an epenthetic vowel (Bafile, (2003: 20) and Cardinaletti & Repetti (2004: 16)).

Normally those who claim and discuss instances of vowel epenthesis, or any other syllabification repair processes, mostly employ MSA as a reference comparing the word and syllable structure of the dialect under investigation to the syllable and word structure of MSA.

To a great extent, comparing Arabic dialects is acceptable and in many cases accounts for a variety of phenomena that are noticed in Arabic dialects these days. This is especially because the dialects, although they have historically changed from MSA, still follow the same system of word and syllable formation in general. Thus, there is no doubt that although related to MSA, each dialect has its own grammar. For example, various dialectal factors may influence the degree of tolerance of consonant clusters in a given dialect; hence, ranging from a dialect that prefers consonant clusters (such as Moroccan Arabic) to a dialect that avoids them (like the Bedouin dialects in general), with moderate types of dialects in between where consonant clusters are tolerated in a certain position but not in the other. Therefore, the issue is not simply to say that in a word such as /galɪb/ 'heart', the 'i' is epenthetic because in MSA the word is pronounced as /qalb/.

Consequently, it is worth at this stage pointing to the confusion of what to consider an epenthetic vowel and what to consider a vowel insertion following the language specific word formation. In doing so, two types of vowel insertion must be recognised in the dialect under study. One is concerned with the dialect's own syllable outputs where underlying monosyllabic CVCC does not exist in ALA and that MSA CVCC nouns are diachronically changed to CVCVC. Therefore, the bi-syllabic simplex nouns /galɪb/ 'heart', /ʕʊmʊr/ 'age' and /tʌmɪr/ 'dates, fruit' should not be treated as arising through epenthesis originating from the MSA underlying forms /galb/, /ʕʊmr/ and /tamr/ although they are, no doubt, diachronically related to them.[73] As the vowel is inserted as part of the word formation and not as a result of the dialect syllabification requirements, the vowel insertion in these cases is not dealt with as epenthesis in the current study.

In his semisyllable analysis of unsyllabified consonants using a constraint-based theory, Kiparsky (2003) accounts for the difference in the position of vowel in different Arabic dialects by interpreting epenthesis as occurring to the left of the semisyllabic consonant in VC dialects to satisfy the prosodic faithfulness. The classification in which Kiparsky identifies three types of dialects in Arabic according to where to break a string of CCC (either as CiCC or CCiC) can be argued against in two respects: first the CCC is not a cluster of three consonants since underlyingly no simplex words contain three consonant clusters in Arabic. It is instead a sequence of heterosyllabic consonants that might have one of the syllabifications C.CC or CC.C.

[73] Such a relation is evidenced in the stress assignment procedure discussed previously.

Following Itô (1986) and (1989) and Broselow (1992), Kiparsky claims that CCC strings exist in Arabic dialects as a result of concatenations of three consonantal suffixes: /gʊl-t-l-h/ and subsequently different dialects syllabify the string that is not allowed by either inserting a vowel between the stem's final consonant and the first suffix or between the two final suffixes, 'l' and 'h' in this example, thus having either CiCC or CCiC, and consequently surfacing as *gelitla* (as in Iraqi) or *ultilu* (as in Cairene) according to the dialect specific epenthesis direction.

The claim I make for this dialect is that in ALA the /-l/ and /-t-/ are added at a later stage after the final morpheme /-t/ has entered the word. This implies that, in such a dialect as ALA, the word-formation vowel insertion applies before the other suffix concatenation. Therefore, having /gʊlɪt-l-h/ that surfaces as /gʊlɪt.lah/ with vowel insertion between the two suffixes 'l' and 'h' means that it is not an application of epenthesis of the vowel 'i' in this case. A similar scenario is expected to be happening in Iraq. This is of course different from the case in Cairene which allows final CVCC but not internally, hence having /ʊltɪlʊ/ instead with a vowel inserted to break up the 'lt' cluster by resyllabifying the 't' as an onset of the following syllable.

A similar case can be adopted for nouns where the words /galɪbna/ 'our heart, /ʕʊmɪrna/ 'our age', /tamɪrkʊm/ 'your dates (fruit)' are claimed to originate from /galɪb/, /ʕʊmɪr/and /tamɪr/, respectively.

Another reason to believe that the vowel is not epenthetic in Iraqi is that the vowel in /gʊlɪt/ for example, triggers the stress to the syllable containing it: /gɪˈltɪtla/ following the fact that epenthetic vowels, unlike phonological vowels, are not visible to the stress assignment rules, as revealed under §4.4 above and as argued for in Watson (2007: 340).

It is also important to state that phonological and vowel epenthesis does not only apply to breaking up consonant clusters. In ALA this process also applies to resyllabify internal CVCs and some cases of internal CVVCs as is observed in Chapter Three. Consider more examples below:

(4.34) Heterosyllabic vowel epenthesis in ALA

/warɪdah/ from /wardah/ 'flower'
/tɪrɪkiːnah/ from /tɪrkiːnah/ 'corner'
/jɪtɪraʒʒa/ from /jɪtraʒʒa/ 'begged, 3SG.M.'
/reːtɪna/ from /reːtna/ 'saw, 2.SG.M. us'
/riːgɪna/ from /riːgna/ 'our saliva'

Vowel epenthesis is primarily used to resyllabify CVC when the following syllables are not dependent morphemes. Furthermore, the concatenation of such morphemes would block the epenthesis occurrence. Such examples of those previously mentioned in Table 3.7 are represented below:

(4.35) Blocking of vowel epenthesis to heterosyllabic consonants in ALA

/ʒɪbɪtkʊm/ 'I brought you (Pl.)'
/mɪʃɪtɪlhʊm/ 'she went to them'
/rɪħna/ 'we were lost'

Although epenthesis is blocked in such words, it can occur because it is one of the features in Bedouin dialects, such as ALA, and people are inclined to add vowels. Therefore, a word like /rɪħna/ might be pronounced as /rɪħɪna/.

Vowel epenthesis also occurs after geminates in internal positions so that the first part of the geminate is parsed to the coda of the preceding syllable, while the second part is parsed as an onset to the following syllable. The obvious reason is because of the bimoraicity constraint that strictly applies to such an Arabic dialect. In addition to those examples in Table 3.10 above, consider more examples below:

(4.36) After geminate vowel epenthesis

/ħʊtˤtˤɪna/ from /ħʊtˤtˤ + na/ 'put!, 2.SG.M. Imp. us'
/wɪddɪna/ from /wɪdd + na/ 'our amiability'
/xaddɪkʊm/ from /xadd + kʊm/ 'your, Pl. cheek'
/rabbɪna/ from /rabb + na/ 'our God'

It is worth mentioning again here that the optional utterance with no epenthesis would result in consonant degemination as previously mentioned. Thus, such examples would be uttered as /ħʊtˤna/, /wɪdna/, /xadkʊm/ and /rabna/, respectively with no gemination, if any.

To conclude, vowel epenthesis occurs in morphologically complex words where concatenation would result in unsyllabifiable inputs that do not meet the dialect's syllabification algorithm. Epenthesis that occurs between heterosyllabic consonants is led by the preference of non-closed syllables word-internally. Having said that, the insertion of a vowel in CVCVC-C verbs is epenthetic, following the tendency of no consonant clusters word-finally in ALA. Finally, CVCC nouns gain a vowel that is inserted diachronically during the formation of the word and consequently, they are not considered to be emerging as a result of an epenthesis process. Thus, the second vowels in /wɪtɪr/ 'cord', /ħɪbɪr/ 'ink' and

/sˤabɪr/ 'patience', for example, which are pronounced as /wɪtr/, /ħɪbr/ and /sˤabr/ in MSA and some other Arabic dialects, are not epenthetic in ALA but are part of the word structure.

4.5.2. Vowel syncope

Vowel deletion applies word-initially with a phonological restriction. As we saw under §3.5, vowel deletion occurs in ALA in a strict phonological environment since an unstressed short vowel in an open syllable is deleted when followed by a CVC, CVVC or even a CVCVG(V) in many cases. The deletion is also restricted by the type of vowel of the second syllable in the first two types, where it must be one of the vowels: /ɪ/, /u/, /ɑː/, /æ/ or /uː/ as rule 3.22 above reveals. Such instances of vowel syncope are represented below:

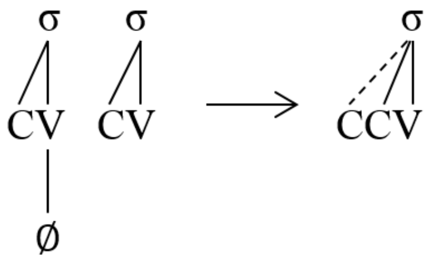
(4.37) Initial vowel syncope in ALA

/mʃʊtˤ/ ~ /mʊ.ˈʃʊtˤ/ 'hair comb'
/smɪʕ/ ~ /sɪ.ˈmɪʕ/ 'heard, 3.SG.M.'
/zʕɪl/ ~ /zɪ.ˈʕɪl/ 'got, 3.SG.M. upset'
/ktʊb/ ~ /kˈtʊb/ 'books'

Consonant clusters can also occur as a result of the influence of the dialect of Tripoli, especially amongst new generations or educated people and can be noticed in rapid speech.

While Watson (2002: 52) argues that the deleted vowel leaves its mora behind, which in turn re-associates with the initial consonant if it is more sonorant than its neighbour, Al-Ageli suggests that the stray consonant that is left after its vowel is deleted and is re-associated as part of the onset of the following syllable by an onset incorporation repair rule as follows:

(4.38) Onset Incorporation (Al-Ageli, 1995: 129)



This rule applies only word-initially in ALA and is blocked word-internally as consonant clusters are not permitted utterance-internally in ALA.

As a result, consonant clusters are parsed as the onset of the initial syllable. However, as the dialect under investigation is a cluster-resistant dialect, optional instances of initial vowel insertion, that in turn triggers glottal stop insertion in careful speech, might be heard.

Another case of vowel deletion is when a vowel-initial suffix (such as /-ʊ/ 'they') is added to verbs such as /ˈjaʃɪrʌb/ 'drink, 3.SG.M.', /ˈjɪkɪtɪb/ 'write, 3.SG.M.' and /ˈjamɪsaħ/ 'sweep, 3.SG.M.' where the final vowel is deleted in: /ˈjoʃɪrbuː/, /ˈjɪkɪtbuː/ and /ˈjamɪsħuː/. As the stress is not affected and is still assigned to the initial syllable, the reason for such a deletion might be thought of as being templatic. After the heterosyllabic vowel epenthesis (the second syllable in the unsuffixed examples) the verbs have the template sequences: CV.CV.CVC. Adding the suffix would result in CV.CV.CV.CV, a length and templatic sequence that is not preferred in ALA since, according to Kenstowicz (1986: 112), what motivates such syncope is the disapproval of long sequences of open syllables amongst Arabic dialects. Therefore, the vowel immediately before the suffix is deleted resulting in CV.CVC.CV instead.

Medial vowel deletion is also tested in ALA when the prepositional suffix /-l/ 'to/ for' is attached where stress is changed to it after the morphological vowel insertion occurs. As a consequence of stress shift, the preposition is geminated if the stressed vowel is short. Consider the following examples where the medial stage shows the morphological vowel insertion (in bold):

(4.39) Vowel deletion in a medial position in ALA

/gʊlˈtɪllak/ / /ˈgʊ.lɪ.**tɪ**.l**a**k/ ~ /ˈgʊ.lɪt-l-k/ ‘told, 1.SG. you, M.SG.’
/ʃifˈtɪllak/ **/** /ˈʃɪ.fɪ.**tɪ**.l**a**k/ ~ /ˈʃɪ.fɪt-l-k/ ‘looked, 1.SG. at you, M.SG.’
/ʒarrɪbˈtɪllɪk/ **/** /ʒarrɪbɪ**tɪ**l**ɪ**k/ ~ /ʒar.ˈrɪ.bɪt-l-k/ ‘tried, 3.SG.F. for you, M.SG.’

In fact, the gemination is not a result of vowel deletion but is a result of stress shift instead. This is clear in such examples where the verbs end with long closed syllables as is exemplified below where, although no vowel deletion occur, gemination still occurs, which means that it is the stress shift rather than the vowel syncope that led to gemination:

(4.40) Stress shift as a motivator of gemination in ALA

/ʃɪreːˈtɪllak/ from /ˈʃɪreːt-l-k/ ‘bought, 1.SG. for you, M.SG.’
/dɪʕeːˈtɪllah/ from /ˈdɪʕeːt-l-k/ ‘prayed, 1.SG. for him’
/warreːˈtɪllɪk/ from /warreːt-l-k/ ‘showed, 1.SG. you, F.SG.’

4.5.3. Vowel lengthening

Vowel lengthening occurs in word final verbs and nouns. The process originally is not a repair process if we compare it to MSA where some words end with a long vowel but is noticed to be shorter in medial utterances than it in final positions since it is not stressed in final positions in MSA and some other Arabic dialects. Thus, in MSA, and for example Egyptian Arabic, /ˈbana/ ‘built, 3.SG.M.’ or the Egyptian nouns /ˈsama/ ‘sky’ that underlyingly are: /banæ/ and /samæʔ/ end with shorter vowels than the underlying forms because they are not stressed. In medial positions, the long vowel is retained: /banæh/ ‘built, 3.SG.M. it’ and /samæh/ ‘his sky’. In Libyan Arabic, Aurayieth (1982: 23) claims that a similar case exists where such short vowels would be lengthened in medial utterances, although, opposite to MSA and Egyptian Arabic, they might be stressed, as in some of Aurayieth’s examples: /ˈbɪnæ/, as in /bɪˈnæha/ ‘built, 3.SG.M. it, 3.SG.F.’, /ˈɣɑːliː/, as in /ɣɑːˈliːha/ ‘her dear one, M.’ and /wɪˈtˤɑː/, as in /wɪˈtˤɑːk/[74] ‘your land’. In showing such a process, Aurayieth claims that “word final short vowels are usually lengthened when they are no longer at the end of the word”.

In ALA, two claims are to be made for the two different types of words. The claim that is made for non-verbal words is that the final vowels are not short although they seem shorter than when stressed. In contrast the verbs still have the final long vowels as they are stressed, and as we observed under §4.4.3 as open short syllables are not stressed word-finally in bisyllabic words. Consider first the examples below:

[74] /wɪˈtˤaːtak/ in ALA as it is a feminine word.

(4.41) Final long vowels

a) verbs

/mɪˈʃæ/ ‘went, 3.SG.M.’, as in: /mɪˈʃælha/ ‘went to her’
/rɪˈmɑː/ ‘threw 3.SG.M.’, as in: /rɪˈmɑːtah/ ‘threw, 3.SG.F. it, M.’
/kɪˈlæ/ ‘ate, 3.SG.M.’, as in: /kɪˈlæha/ ‘ate, M. it, F.’
/rɪˈxɑː/ ‘loosen / let go, 3.SG.M.’, as in /rɪˈxɑːk/ ‘let, 3.SG.M. you go’

b) Nouns

/sɪˈmæ/, as in /sɪˈmæk/ ‘your, sky’
/rɪˈxɑː/, as in /rɪˈxɑːk/ ‘your prosperity’
/ħɪˈsæ/, as in /ħɪˈsæj/ ‘my soup’

Such verbs that end with a vowel are originally called “defective verbs (al-fiʕl al-naaˤqisˤ”) in MSA (Ryding, 2005: 463). Such a vowel is a long vowel and is called “madd” and can be discovered word internally and sometimes finally, as in the verbs in a) above. They do not sound long in MSA as they are not stressed although they are easily identified as long in a Libyan dialect such as ALA because of the stress effect. Thus, no claim is made here that vowel lengthening may occur in such verbs when they occur in medial positions. Alternatively, the claim is that final long vowels sound longer in medial positions when concatenation occurs in such cases.

The words in b) above end with a glottal stop that is diachronically lost as the words are presented in the dialect. Such a tendency is common in Arabic dialects where underlying glottal stops are omitted. Such a process is dealt with in Chapter Two and is not considered as a process of repair.

Chapter 5. Conclusion and recommendation for future research

5.0. Introduction

This thesis has examined some of the phonological issues in a previously non-documented dialect in Libyan Arabic. The significance of it is in the fact that the previously studied Libyan dialects did not include any of the Bedouin dialects in the western area. Having said so, the Al-Jabal dialect which is stated as being the dialect of Aljabal Algharbi (The Western Mountain) by Harrama (1993: 13) is different from ALA, which is spoken in one of the towns of the Western Mountain as is stated before. The Western Mountain is a wide (mostly flat) area with a large variety of Arabic and non-Arabic (Amazigh) towns that cover an area of approximately 4000 km^2 with a population of roughly 40.000.

Documenting a dialect is not an easy task. Although such a study should take a descriptive route, many challenging issues arise though as the current study reveals. These are explored deeply enough to serve the thesis goal and not beyond.

The main question in this thesis is the nature of the syllable structure and syllabification in ALA. The answer to this question is explored in the four chapters where sub-questions arise. While introducing the dialect under investigation in Chapter One, the basics of the syllable theory in phonology are also discussed. In Chapter Two both the phonemic and the allophonic analysis are presented with a brief discussion in relation to the emphatics in ALA, where most of the allophonic constituents that exist in the dialect are a consequence of consonants and vowels emphasis spread. Apart from the emphatic allophones, only two other allophones exist in ALA: the velar [ŋ] and labiodental [ɱ] that exist as a result of assimilation (§ 2.1).

Glottal stop is another issue that arises while discussing the phonemic distribution in ALA. Two contrasting issues are discussed. One of which the glottal stop loss, which is a synchronic change rather than phonological. The other glottal stop issue is the glottal stop epenthesis, which many researchers claim occur word-initially to avoid vowel-initial syllables. While it is obligatory in most previous analyses of Arabic language and dialects, the claim that is made in the current thesis is that such epenthesis is optional where the existence of the epenthetic glottal stop depends on how much emphasis is put on the production of vowel-initial word. In saying so, the claim made here is that the pre-vowel utterance preparation is similar to any other world’s dialect, i.e., it phonetically occurs. The case is complicated in Arabic as syllable-initial glottal stop phonemes also co-exist in the language and its related dialects.

“Phonologically existent geminates” is another issue in ALA and its syllabification is considered in the dialect syllabification algorithm. Thus, while the existence of geminates in ALA is discussed in chapter Two, their syllabification is analyzed in
§ 4.2.3.

Emphatic vowels are claimed to exist in the dialect and their existence in a word also affects the word in a similar way to that of emphatic consonants, where emphasis spreads to the adjacent constituents. Similar examples to those in §2.6.4 are [b̂ʌħ̂ʌr] ‘sea’ and [m̂ɑːm̂ʌ] ‘mom’.

Chapter Three begins with a preface of the syllabification process in traditional philology. The chapter subsequently presents a discussion of the syllable types, distribution and the role of sonority in ALA syllabification. The chapter also discusses the most controversial issue in Arabic; that is, vowel-initial syllables. With regards to this, most researchers claim that such syllables are banned in Arabic; however, the current study presents its possibility showing the confusion behind the issue. Initial consonant-clusters and heterosyllabic consonants are also discussed.

Chapter Four includes a discussion concerning syllabification in ALA, presenting the dialect syllabification algorithm and stress parameters. In doing so, issues such as syllable weight and directionality of syllabification are discussed. The chapter also presents a discussion of the treatment of superheavy syllables using a moraic theoretical analysis as presented in previous literature.

The current chapter includes a review of the thesis and provides a discussion of the main issues that are raised during the investigation of the syllabification of ALA. These are considered in the following few sections with a recommendation for future research to sum up the discussion.

a. Vowel-initial syllables and initial glottal stops

As is claimed in § 3.4, the requirement of the existence of “epenthesised” glottal stop to avoid vowel-initial syllables in Arabic is misleading. The reason is because researchers do not differentiate between epenthetic and underlying glottal stops by treating a word such as /(ʔ)ɪstɪmæʕ/ ‘listening’ as underlyingly similar to /ʔɪslæm/ ‘Islam’ which is not the case as, while /ʔɪslæm/ has the glottal stop in its input, /(ʔ)ɪstɪmæʕ/ has the input /ɪstɪmæʕ/ (or even /stɪmæʕ/ according to McCarthy, 1981). Therefore, both types of glottal stops should be treated differently, as while the EG (epenthesised glottal stop) is optional; the UG (the underlying one) is not but is part of the word underlying structure.

The first recommendation to be made here for further research is a phonetic analysis of both types of the glottal stop, which exist in ALA in particular and Arabic dialects in general; these are UG and EG. It is particularly useful to conduct a phonetic analysis of a comparison between EG-initial syllables in Arabic and vowel-initial syllables in a language such as English where no initial UG exists.

b. Emphatic vowels

Emphatic consonants have been studied extensively before. Furthermore, their effect on adjacent constituents (emphasis spread) is also considered where issues such as the direction, distance and level of emphasis spread are said to be language specific. As the literature reveals that emphasis of consonants spreads to adjacent vowels as well as consonants, there is poor consideration of emphasis in words that do not happen to have emphatic consonants in. Youssef (2006: 40) for example mentions the existence of a “pharyngealised” vowel in Cairene. The issue is of specific importance to such languages that reveal emphatic morphemes in addition to allophones, in order to study their effect on the syllable. Thus, it is crucial to examine the source of emphasis in words that do not contain emphatic consonants. In this thesis I claim that ALA has two emphatic vowels. These are the short /ʌ/ and the long /ɑː/ in: [x̑ʌʃ̑] ‘he entered’ and [f̂ɑːr̂] ‘mouse’.

It is recommended though that a more phonological and phonetic investigation includes more than one Arabic dialect to investigate the case, especially taking into consideration Zawaydeh’s claim of the existence of what she calls “secondary emphatics in words that contain emphatic consonants rather than the Arabic known set of emphatic consonants; these are /tˤ, dˤ, ðˤ, sˤ/ (1999: 26) Consult § 2.1 for full discussion)

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Appendix (1)

Initial consonant-clusters and blocking of initial consonant-clusters in ALA

(To support the discussion of consonant clusters in ALA in § 3.17)

Word	UG	Gloss
/bdɪl/	/bɪdɪl/	suits (clothing)
/bɪkɪt/		Cried, 3.SG.F.
/bɪgɪt/		she stayed
/btˤʊn/	/bɪtˤʊn/	buttons
/bɪsɑːtˤ/		carpet
/bsʊtˤ/	/bɪsʊtˤ/	carpets
/bɪɣɑːl/		mules
/biħuːθ/		researches
/bɪʕæd/		far away, Pl.
/bʕɪd/	/bɪʕɪd/	went away, 3.SG.M.
/bɪnæt/		girls
/bnɪttah/	/bɪnɪttah/	girls
/bɪlæd/		country
/bɪlatˤtˤah/		Threw, 1.SG. it, 3.SG.M. down
/brɪd/	/bɪrɪd/	became cold
/bɪjæn/		engagement ceremony
/bjɪl/	/bɪjɪl/	batteries
/tfæl/	/tɪfæf/	spitting
/tʃir/	/tɪʃɪr/	vicious
/triːs/	/tɪriːs/	men
/dbɪl/	/dɪbɪl/	wedding rings
/dkæn/	/dɪkæn/	became darker, 3.Sg.M.
/dɪʒæʒ/		chickens
/dɪxuːl/		wedding night
/dɪʕɪt/		invited, 3.SG.F.
/dɪhæn/		grease
/dɪmɪt/		Bleeding, 3.SG.F.
/dɪnɪt/		Came, 3.SG.F. closer

/dılæl/		flirting
/dırıt/		New, 3.SG.F.
/dıjɑːr/		rooms
/dfæl/	/dıfæl/	saliva
/kbır/	/kıbır/	grew up, 3.SG.M.
/ktıb/	/kʊtıb/	is fated
/kfuːf/	/kıfuːf/	slaps, Pl.
/kθır/	/kıθır/	grew in number
/kısæd/		boring
/ksıb/	/kısıb/	he won
/kıʕab/		pieces
/kıʕuːb/		heels
/kmıl/ / /kımal/	/kımıl/	is finished
/kılæm/		speech
/kırɑːʕ/		foot
/kıjæl/		measurement
/kjıl/		measurements
/kwıʃ/	/kıwıʃ/	ovens
/kıwɑːh/		Ironed, 3.SG.M. it, 3.SG.M.
/gıbuːr/		graves
/gıduːr/		pots
/gdır/	/gıdır/	he was capable
/gtˤʊʕ/	/gıtˤʊʕ/	pieces
/gısˤuːr/		palaces
/gıðæf/		vomiting
/gızæz/		glass
/gıʃuːr/		peels
/gıʕuːr/		bottoms
/gıðˤɑːh/		Spent, 3.SG.M. it, 3.SG.M.
/gmıʒʒah/	/gımıʒʒah/	traditional clothes
/gmɑːr/	/gımɑːr/	gambling
/gınajjın/		handsome
/gınæʕ/		maks
/gılıt/		she fired

/grɪb/	/gɪrɪb/	he approached
/tˤɪbuːl/		drums
/tˤɪweːr/		bird, Diminutive
/tˤɪwɑːl/		long, Pl.
/sˤɪbɑːħ/		morning
/sˤbɪɣ/	/sˤɪbɪɣ/	dyes
/sˤduːr/	/sˤɪduːr/	breasts
/sˤɪguːtˤ/		failing
/sˤguːr/	/sˤɪguːr/	falcons
/stˤuːl/	/sɪtˤuːl/	buckets
/sˤfʊr/	/sˤɪfʊr/	trays
/sˤxɑːb/	/sˤxɑːb/	traditional necklace
/sˤɣɑːr/	/sɪɣær/	children
/sˤħɑːb/	/sɪħæb/	friends
/sˤʕʊb/	/sˤɪʕʊb/	became difficult
/sˤmɑːr/	/sˤɪmɑːr/	became darker (in complexion color)
/sˤnɑːn/	/sˤɪnɑːn/	bad smell
/sˤɪlɑːh/		praying
/sˤɪrɑːf/		cash change
/sˤjæm/		fasting
/ftæt/	/fɪtæt/	traditional bread
/fɪtˤuːr/		breakfast
/fsɪd/ / /fɪsad/	/fɪsɪd/	rotted
/fʃɪl / fɪʃal/	/fɪʃɪl/	failed
/fʒɪl/ / /fɪʒal/	/fɪʒɪl/	radish
/fxɑːð/	/fɪxɑːð/	thighs
/fhuːd/	/fɪhuːd/	leopard
/fɪðˤal/		remained
/fɪnɑːr/		lantern
/flæʃ/ / /fɪlæʃ/	/fɪlæʃ/	flash
/fɪraːʃ/		matress
/fjil/	/fɪjɪl/	elephants
/θgɪl/	/θɪgɪl/	became heavy
/θgæl/	/θɪgæl/	heavy, Pl.

/θxɪn/	/θɪxɪn/	became thick
/ðku:r/	/ðɪku:r/	males
/ðɪhæb/		going
/ðhɪb/	/ðhɪb/	lost his mind
/ðju:b/ / /ðjæb/	/ðɪju:b/ / /ðjæb/	wolves
/sbɪħ/	/sɪbɪħ/	praying beads
/stær/	/stær/	curtain
/sku:t/	/sɪku:t/	silence
/sgɑ:tˤ/	/sɪgɑ:tˤ/	failing
/sɪgaˤtˤ/		he failed
/sxɪn/	/sɪxɑ:n/	hot, Pl.
/sɪxu:n/		hot
/sˤħɑ:n/	/sˤɪħɑ:n/	plates
/sɪhɪt/		she was absent-minded
/smɪʕ/	/sɪmɪʕ/	heard
/slɪm/	/sɪlɪm/	is saved
/sɪwɑ:k/		tooth stick
/swɪd/	/sɪwɪd/	became black
/zʕɪl/	/zɪʕɪl/	is upset
/zjæn/	/zɪjæn/	decoration
/ʃbɪʕ/	/ʃibɪʕ/	is full (in food)
/ʃdu:g/	/ʃɪdu:g/	cheeks
/ʃikɪt/		she complained
/ʃifɪt/		recovered
/ʃʕɪf/	/ʃʕɪf/	he regretted
/ʃɪhæb/		meteor
/ʃhɪb/	/ʃihɪb/	Became, 3.SG.M. grey (in color)
/ʃmæl/	/ʃɪmæl/	nappy
/ʃnæb/	/ʃɪnæb/	mustache
/ʃrɪt/	/ʃɪrɪt/	she bought
/ʃjɪn/	/ʃɪjɪn/	he became thin
/ʃwɑ:l/	/ʃɪwɑ:l/	sack
/ʒbæl/	/ʒbæl/	mountains
/ʒdu:d/	/ʒɪdu:d/	grandparents

/ʒɪfæf/		dryness
/ʒɪfɪt/		she forsook
/ʒɪmæm/		full amount
/ʒɪnæn/		garden
/xθɪr/	/xɪθɪr/	became thick
/xʃæn/	/xɪʃæn/	became plump
/xðˤɑːb/	/xɪðˤɑːb/	tattoo
/xmɪr/	/xɪmɪr/	rotted
/xlɪt/	/xɪlɪt/	vacated
/xrɪb/	/xɪrɪb/	is broken
/ɣsælah/	/ɣesælah/	handwasher
/ɣzælah/	/ɣɪzælah/	deer
/ɣðˤob/	/ɣɪðˤob/	he got angry
/ɣlɪb/	/ɣɪlɪb/	is defeated
/ɣrɪg/	/ɣɪrɪg/	sank
/ɣjuːm/	/ɣɪjuːm/	cluds
/ɣwɪl/	/ɣɪwɪl/	goblins
/ħbæl/	/ħɪbæl/	ropes
/ħɪkɪt/		she narrated
/ħɪsˤɑːd/		harvesting
/ħɪmæt/		sister-in-law
/ħɪnæn/		tenderness
/ħɪlæl/		halal
/ħɪrɑːm/		taboo
/ʕɪbɪt/		I relied
/ʕɪtɪt/		I became haughty
/ʕtɪb /	/ʕɪtɪb/	doorsteps
/ʕɪdɪt/		she spread a disease
/ʕɪgɑːb/		remains
/ʕɪgad/	/ʕɪgad/	knotted
/ʕɪtˤaːˤk/		Gave, 3.SG.M. you
/ʕðɪb/	/ʕɪðɪb/	is purified (water)
/ʕɪʒæʒ/		strong wind
/ʕɪlæʃ/		why?

/ʕɪlɪg/		is stuck
/ʕɪjɑːr/		measuring instrument
/ʕɪwaːd/		repeating
/hbɪl/	/hɪbɪl/	became crazy
/hɪbæl/		craziness
/hɪʒæʒ/		fleeing
/hrʊk/		men’s jilbabs
/hweːdiː/		quiet (person), Dim.
/ðˤbeːʕ/	/ðˤɪbeːʕ/	hyeana, Dim.
/ðˤʕʊf/	/ðˤɪʕʊf/	became thin
/ðˤɪlam/		he oppressed
/ðˤɪlæm/		darkness
/ðˤjɪm/	/ðˤɪjɪm/	oppression
/mbæt/	/mɪbæt/	spending the night
/mtæn/	/mɪtæn/	Became, 3.SG. M. strong
/mdʊn/	/mɪdʊn/	cities
/mɪkan/		place
/mɪgɑːl/		speech
/mɪtˤɑːr/		airport
/mɪsan/		knife sharpner
/mɪzæd/		auction
/mɪʃan/		skin dryness
/mɪxɑːd/		pillows
/mɪħæl/		places
/mɪʕæʃ/		salary
/mnɪʕ/	/mɪnɪʕ/	he ran away
/mɪlæh/		Filled, 3.SG.M. it, M.
/mɪræt/		the wife of
/nɪbæt/		I spend the night
/nɪdɪt/		moistened
/nɪʃɑːtˤ/		vaitality
/nʃɪf/	/nɪʃɪf/	it dired
/nɪʒæt/		surviving
/nɪɣʌr/		felt sad

/nɪħæs/		copper
/nɪʕæʒ/		sheep, Pl.
/nɪhɑːr/		day
/nɪðˤɑːm/		system
/lbæs/	/lɪbæs/	wearing
/lsæn/	/lɪsæn/	tongue
/lɪzuːm/		necessity
/lɪjæn/		panels
/lɪɣab/		teethgum
/lħɪg/	/lɪħɪg/	went after
/lmɪʕ/	/lɪmɪʕ/	shined
/ljɪn/	/lɪjɪn/	is softened
/lɪwaːʃ/		for what
/rbɪħ/	/rɪbɪħ/	he won
/rdæʔ/	/rɪdæʔ/	traditional clothes
/rkɑːb/	/rɪkɑːb/	kness
/rgɑːb/	/rɪgɑːb/	nicks
/rtˤʊb/	/rɪtˤʊb/	kind of dates (fruit)
/rɪzɪn/		became heavy
/rɪʃæd/		stones
/rxʊsˤ/	/rɪxʊsˤ/	became cheap
/rɪxɑːm/		marble
/rɪʕæʃ/		shivering
/rhɪf/	/rɪhɪf/	became thiner
/rðˤɑːb/		saliva (in poetry)
/rɪmɑːd/		ash
/rjæf/	/rɪjæf/	longing
/jbɪs/	/jɪbɪs/	dried
/wsˤɪl/	/wɪsˤɪl/	he arrived
/wkɪd/	/wɪkɪd/	is assured
/wɪtˤɑːt/		land of
/wɪfɪj/		loyal
/wθɪg/	/wɪθɪg/	he trusted
/wθɪb/	/wɪθɪb/	he ran

/wðæn/	/wɪðæn/	ear
/wɪsæm/	/wɪsæm/	medal
/wzɪn/	/wɪzɪn/	is weighed
/wshɪn/	/wɪʃɪn/	he had a dry skin
/wʒɪd/	/wɪʒɪd/	existed
/wħæm/	/wɪħæm/	the pregnant's craving
/wʕɪr/	/wɪʕɪr/	became difficult
/whɪn/	/wɪhɪn/	became weak
/wðˤɪħ/	/wɪðˤɪħ/	became clear
/wlɪʕ/	/wɪlɪʕ/	is swiched on
/wrɪθ/	/wɪrɪθ/	inherited