The loss of the vocalic case markers and its consequences on surfacing complexity: Postulating phonological and morphological change in the Arabic language

Thesis submitted to the Faculty of Humanities, Arts and Social Sciences
in partial fulfilment of the requirements for
the degree of Doctor of Philosophy (Integrated)

(Linguistics)

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July 2018

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ [1]

Declaration

The material contained within this thesis has not previously been submitted for a degree at Newcastle University or any other university.

Abstract

This thesis examines the loss of case markers in Arabic. It provides a morpho-phonological investigation assuming there are consequences for losing the vocalic case markers in Arabic. The main consequence is the innovation of the CVCC syllable type in Arabic. The investigation focuses on trilateral nominal that consists underlyingly of فعْلCVCC. In its nature, it is a diachronic-synchronic examination that was undertaken upon finding a research gap in literatures.

The rationale for conducting this investigation is the evident parallel in the phonological function and the locus between the lost vocalic short markers and the modern epenthetic vowels. In addition to the morpho-syntactical function, case markers in Arabic phonologically prevent final-clusters from surfacing in CVCC underlying sequences. Since modern Arabic dialects lost the vocalic case markers it is expected that they manifest final consonantal clusters on the surface of such nominal underlying CVCC sequences. However, contrary to this expectation, an epenthesis process, which has captured a synchronic interest from phonologists, occurs in the dialects preventing the realization of CVCC syllable type. Notably, no investigation was done to examine the possibility that this epenthesis originated due to the loss of the markers even though phonologists realized that the epenthesis is provoked to prevent the final-clusters from surfacing.

This study contributes towards understanding: (i) the loss of the vocalic markers, (ii) the raise of the modern epenthesis and (iii) the innovation the superheavy syllable type CVCC in Arabic. Moreover, a goal in this study is to present an account for the data within a moraic approach in a framework that characteristically captures generalizations through a ranking for constraints in different levels. The account for data in this thesis is through the tools of the Stratal version of Optimality Theory.

Acknowledgments

Contents

Abstract

Acknowledgements

Contents

List of Abbreviations

List of Appendixes

List of abbreviations

ACC	Accusative
ALT	Arabic Linguistic Tradition
CA	Classical Arabic
EVAL	EVALUATOR
ECA	Egyptian Cairene Arabic
Fem	Feminine
GEN	Genitive
GEN	GENERATOR
IPA	International Phonetic Alphabet
IBA	Iraqi Baghdadi Arabic
KħA	Kuwait ħader Arabic
LPM-OT	Lexical Phonology and Morphology in Optimality Theory
MA	Modern Arabic
Masc	Masculine
MEOSL	Middle English Open Syllable Lengthening
MMA	Marrakesh Moroccan Arabic
MSA	Modern Standard Arabic
NOM	Nominative
Obj	Object
OT	Optimality Theory
1Pers	first person
2Pers	second person
3Pers	third person
Plur	plural
SA	Standard Arabic
SBPM	Sign-Based Phonology and Morphology
SCA	Sudanese Colloquial Arabic
Sing	Singular
SSP	Sonority Sequencing Principle
Subj	subject
TMS	The Morphological Scale The Morphological Scale
μ_{adj}	Adjoined mora
WL	Western Linguistic
WGG	West Germanic Gemination

List of Appendixes

Appendix 1

Appendix 2

Appendix 3

Appendix 4

Appendix 5

Appendix 6

Appendix 7

Appendix 8

Chapter1
Introduction
An overview

1.1 Introduction

This chapter provides an overview of the main contents and ideas that appear in the chapters of this thesis which consists of six chapters including this introduction chapter. Each of these chapters contributes towards understanding the loss of the short vocalic case markers in the Arabic language. As will be seen, in terms of the organization the thesis, the materials are presented in the form of a construction that has the ultimate goal of demonstrating a hypothesis. This hypothesis reintroduces a documented modern epenthesis process in some modern Arabic dialects in terms of its role in language change. It presents this epenthesis as a phonological repair strategy that has the aim of preventing the innovation of CVCC syllable type in Arabic. This innovation is argued to be a direct result for the loss of the case and mode inflections in Arabic.

Nonetheless, to comprehend the research well, I illustrate the general lines of the presentation. Stylistically, I begin by summarizing the content of the chapters. In addition, to avoid mistakes and errors in understanding reading the transcriptions I explain in the very early stage the symbols that are used to refer to the sounds system. This is followed by giving important background about main topics that are part of the investigation, (i.e., case, pause and assimilation in Arabic). The hypothesis of this study is then verbalized within the justifications that rationalize it. In doing this, the contributions that were made by phonologists and historical linguists to discover the relationships between the modern epenthesis process and the loss of the case markers were elaborated upon. Within this elaboration, it is argued that there is a research gap for approaching the loss of case/emergence of vowel epenthesis from a morpho-phonological perspective. Under the commitment of fulfilling this research gap a method to test the hypothesis is designed. In brief this designed method is presented in terms of its main aspect in chapter three but appears in more detail in chapter four. The presentation would then go on to allude upon the findings that were obtained from the collected data. Discussing these findings to form conclusions and make generalization then follows. The next that appears is a utilizing for a stratal version of the Optimality theory to build an analysis that has the goal of capturing the diachronic findings about the evolution of CVCC syllable type in Arabic and the emergence of the vowel epenthesis. In the last chapter, the presentation raises several topics that are related to the research. These topics include the innovation in Arabic, the life cycle of

phonological processes in the light of this study's results, theoretical concerns and the limitations of this study.

1.2 The content of the thesis

In brief, this study consists of six chapters. The first is this introduction chapter, which as has been explained above, has the motive of being explanatory in terms of: (i) explaining the structure of the thesis and main aspects that are discussed in the chapters and (ii) illustrating details that are related to the transcription of data and Arabic terminologies and names that appear in this thesis. This illustration has the target of clarifying the different practices that are found in the Arabic literature in transcribing Arabic data. It also has the target of arguing that The International Phonetic Alphabet (IPA) symbols that are used in this thesis to refer to phonetic components are more appropriate than other noticed symbols. These other noticed symbols, though may be known for those who work on the Arabic language but they are less known to those who work in phonology. In addition, some of them cause confusion.

The second chapter introduces foundations as a background that is essential to understand the hypothesis of this study. Utilizing my own experience as a grammarian in the field of the Arabic Linguistic Tradition (ALT, henceforth), I explain the distinction between the Arabic term الإعرابʔiʕraab and the Western Linguistic (WL, henceforth) term *case*. The pausing phenomenon and the assimilation phenomenon are introduced due to their noticed relationships with the loss of the الإعراب *ʔiʕraab*, (i.e., case and mode markers). The importance of this chapter is that it enables those who are un-experienced with Arabic linguistic literature to access not only this thesis but also the literature about the Arabic language. The accessibility is because some practices that are made by the Arabicists and others who work on Arabic were among the focuses of this chapter.

The third chapter is concerned with introducing the hypothesis of this study and the rationales that justify it. Explaining the innovation of the superheavy CVCC as a canonical syllable type in the syllable inventories of Arabic is the main target in this study. The thesis of the hypothesis recognizes that this type of syllable was marked in the classical era being conditioned in terms of its realization to sentence-final position. Notably, the deletion of the vocalic case markers was in the classical era limited to sentence-final position. In other words, in the classical era, generally, the CVCC syllable type results because the vocalic markers get deleted. Accordingly, the loss of the markers would make us predict logically that this type of syllable will be unmarked in the Arabic language in the modern era. However, in contrast to this prediction, this syllabic innovation is avoided by inserting

vowels that have the same phonological function of the lost case markers but not the syntactic function. The phonological similarities in function and locus between the epenthetic vowels in modern Arabic dialects and the lost short vocalic case markers are illustrated. The illustration proves that in the modern era, the Arabic dialects exhibits variations in terms of the markedness of CVCC.

In addition to introducing the hypothesis in some detail and the rationales, the third chapter explains the method of examination that is designed to test the hypothesis. I define main terminologies that appear in this study, the sources that are used to obtain the classical data and the modern data. In brief, the two sources that were planned to be used are mentioned in this chapter. However, the details of them and of the methodology of obtaining the data from them appear in the next chapter.

Chapter four is longest chapter in this thesis. This is because it has three focuses, (i.e., the methodology of obtaining data, discussing findings, and making generalizations). As will be seen, it is concerned with explaining in detail the methodologies that were used to obtain the data of both eras. In this explanation the criteria that conditioned the collection of data are provided with their justifications. This was followed by alluding upon the findings of the investigation and discussing them. The outcomes of the discussion are three significant conclusions. The first significant conclusion is that the obtained classical data demonstrates that inserting the round /u/ is the origin of the modern epenthetic vowel. The second is an outcome that results from the obtained data of the modern era. This data show that phonology did not limit the strategies that prevent the syllabic innovation to vowel epenthesis. Rather, these data reveal that phonology have incorporated more mechanisms to avoid the innovation of CVCC syllable type, (i.e., diphthongization and CVCC→CCVC shift). Another significant conclusion is an outcome that was discovered from both types of data. The two data show that there is sound change that targets the phonetic statue of the glottal stop. This was concluded because of a ʔ-deletion process that is followed by a compensatory lengthening process. The ʔ-deletion process was not limited to word-final position. This observed fact meant that even though ʔ-deletion contributes towards preventing CVCC but it is not motivating this superheavy syllabic innovation.

Chapter five is concerned with suggesting an analysis within the framework of stratal Optimality Theory. Since the thesis is focused on the innovation of CVCC syllables, (i.e., CaCC, CiCC and CuCC) as a syllable type in Arabic, a review of how this superheavy syllable has been accounted for in previous theoretical research is presented. The argument in this review is that the recognition of moraic weight within the analysis is the best approach to

account for the evolution of this type of syllable in Arabic. The application of moraic theory in Optimality Theory has problems (see Bermúdez-Otero1999). Thus, the modifications that are made by Bermúdez-Otero (1999) for the application of moraic approach in a stratal version of the Optimality Theory were adopted in the proposed analysis as explained in this chapter. In addition, theoretically, this chapter introduces the notion of confines as a new established descriptive tool that has the target of finding out the boundaries of each stratum in a language.

The last chapter is the concluding chapter which emphasizes on the issue of innovation in the Arabic language. In addition, the sixth chapter highlights the relationship between the results of this study and the theoretical notion of the life cycle of phonological processes with the aim of developing future research. Moreover, some theoretical and cultural concerns have been explained. This chapter concludes with the limitations of this study. Finally, I declare that the usage of the terminologies and theories of WL does not mean that I agree with any hypothesis or idea that contradicts the Islamic faith. This statement is made as a precaution because of teleological notions regarding *language* that I read but I am not sure of. It is also intended to draw the attentions of linguists about what the holy Qur'an and Prophet Muhammad's ﷺ Sunnah inform regarding *language*.

1.3 The transcription

1.3.1   The transcription of data

The linguistic data are transcribed based on the IPA system as best as I know. However, be aware that my studies for WL did not include phonetics. Two subsections are provided next that introduce the sounds of Arabic that I know. The first is concerned with the consonants of Arabic whereas the second is concerned with its vowels.

1.3.1.1 The consonants in Arabic phonology

The goal here is to introduce the consonants of the Arabic language. This includes the consonants of both the classical era and the modern era. The established phonemic sounds of Standard Arabic (SA) are considered the basic phonemes of Arabic in two eras. This is because it is the classical variety that was standardized by the early grammarians. Moreover, it is understood that it was the most common variety in that early era. Furthermore, this variety is practiced in both eras. Yet, both modern and classical ears have other dialectal sounds that are not part of SA phonology. These recognized sounds, whether in the classical

era or the modern era, are also introduced here as other sounds of Arabic phonology. Therefore, the target in this subsection is to introduce all the consonants sounds of both eras that I know. Since SA phonology is considered the basic of Arabic phonology it is introduced first.

The Table 1.1 below presents the symbols that are used in this thesis to refer to the phonemic consonant sounds of SA. Hence, they are phonemic in the classical era. In addition, most of these sounds are still phonemic in the modern Arabic dialects, though a dialect may not exhibit all of them. Therefore, the sounds in Table 1.1 are phonemic not only in SA but also in other Arabic varieties on a general basis. From these facts that these sounds are the basic phonemes of Arabic phonology is concluded. I also conclude that the dialectal sounds are a result of sound change of one of these basic phonemic sounds of Arabic. Nonetheless, the reason that makes me attribute the basic sounds to mainly SA is the established certainty in both fields of research the ALT and the WL that these sounds are phonemic in SA.

ALT	IPA	Description	observation
أ	ʔ	Voiceless glottal stop (plosive)	آ is another symbol for a glottal stop that is characterized of being erasable in ALT.
ب	b	Voiced bilabial stop	
ت	t	Voiceless alveolar plosive	
ث	θ	Voiceless dental fricative	
ج	ʒ	Voiced post-alveolar fricative	
ح	ħ	Voiceless pharyngeal fricative	
خ	x	Voiceless velar fricative	
د	d	Voiced alveolar plosive	
ذ	ð	Voiced dental fricative	
ر	r	Voiced alveolar liquid (rhotic)	
ز	z	Voiced alveolar fricative	
س	s	Voiceless alveolar fricative	
ش	ʃ	Voiceless post-alveolar fricative	
ص	sˤ	Voiceless emphatic alveolar plosive	
ض	dˤ	Voiced emphatic alveolar plosive	
ط	tˤ	Voiceless emphatic alveolar plosive	

ظ	ðˤ	Voiced emphatic dental fricative	
ع	ʕ	Voiced pharyngeal fricative	
غ	ɣ	Voiced velar fricative	
ف	f	Voiceless labio-dental fricative	
ق	q	Voiceless uvular plosive	
ك	k	Voiceless velar plosive	
ل	l	Voiced lateral approximant	lˤ is an emphatic allophone.
م	m	Voiced bilabial nasal	
ن	n	Voiced alveolar nasal	
هـ	h	Voiceless glottal fricative	
و	w	Voiced labial-velar glide	
ي	j	Voiced palatal glide	

Table 1.1: The phonemic consonant sounds in SA

It is observed that the modern Arabic dialects exhibit other consonant sounds. The following are known for me:

IPA	Description	Observation
g	Voiced velar stop	It is noticed that this sound surfaces instead of /q/ in some modern Arabic dialects. (e.g. [qaala] → [gaal] "He said" in Kuwaiti Arabic)
ʧ	Voiceless palato-alveolar affricate	It is noticed that this sound surfaces instead of /k/ in some modern Arabic dialects. (e.g. [kalb] → [ʧalb] "dog" in Kuwaiti ħadar Arabic)
ʤ	Voiced palato-alveolar affricate	
ŋ	Voiced velar nasal stop	
v	Voiced labio-dental fricative	

Table 1.2 More consonant sounds in the modern Arabic dialects

Two issues need to be stated regarding the sounds that appear in Table 1.1. Firstly, they all have a geminate counterpart in SA. There is no restriction for these geminate counterparts other than word-initial in SA, Modern Standard Arabic (MSA) [1] and, as far as I

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[1] Be aware that the differences between SA and MSA do not include the sound system as these two Arabic variations have the same sound system.

know, all the Arabic variations of the classical era. Contrary, some modern Arabic dialects are claimed to have geminates initially (see: Kiparsky, 2003).

Secondly, I have noticed that the literature of the Arabic language exhibits differences in terms of the symbols that are used to refer to some sounds of Arabic. These differences are because of the adopted system for transcription. Notably, a researcher might mix two different systems in his/her transcription of the Arabic data. Nonetheless, I give examples for different symbols which are encountered in the literature for some Arabic sounds. For instance, the pharyngeal fricative voiced might be transcribed as ʕ following IPA or as number 9 in some old literature. The symbol ˚ is also seen as a transcription for the Arabic pharyngeal fricative voiced in the old literature. Another noticed symbol is ᶜ which is still used even by those who declare that they are adopting the IPA. In this study the pharyngeal fricative is transcribed following the IPA as [ʕ]. Another example of utilizing different symbols can be noticed in the transcription of the Arabic emphatics. Whereas the emphatic sounds are transcribed by adding the pharyngealized diacritic ˤ to sound symbol, (e.g., [sˤ]) in this study, it is noticed that some transcribe them by adding a different form of diacritic, (e.g., dotes ş). It was noticed as well that many western research transcribe the glides as *w* and *y*. I confined myself with the IPA symbols [w] and [j].

On the other hand, the differences that appear in the literature might be due to disagreement between the phonologists in views of what is a sound that is being described by the early grammarians in the classical era. For example, it is noticed that Al-Nassir (1993: 11) suggests the sound [G] as an equivalent for the sound ق of classical era. Al-Nassir (1993) in his suggestion was aiming to capture Sibawaih's description for this sound. However, his suggestion contrasts with Watson's suggestion, (i.e., '*q*') for the same sound of the same era (2002: 13, 17-18). It was noticed that even though Watson (2002: 13) is citing Sibawaih[2] and Al-Nassir (1993) for her table of 'Consonantal phoneme inventory for eighth-century CE Classical Arabic' but she did not take all Al-Nassir's (1993: 11) suggestions. Watson (2002) does not justify the reason(s) for giving symbolic suggestions that differ from here cited source, (i.e., Al-Nassir's) even though he is introducing them within the establishments of WL. The different symbolic are taken to be an argument between the two phonologists in terms of what is the phonetic component of the letter ق. Even though I do not follow Watson (2002) in all her argued phonetic component but I follow her in arguing that the phonetic

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[2] Watson uses the 1982 edition of Sibawaih's book whereas I use the 2009 edition of the book. However, both of them are edited by the same editor, that is, Haaruun, A.

value of ق is /q/. I further argue that /q/ surfaces in the classical era as [q]. Yet, I do not exclude the possibility that in the eighth century there were substitution for [q] with [G].

To justify the position that is taken here regarding the sound ق, I know that SA is the most common variation that was standardized by the grammarians in the classical era. Thus, I consider the phonemes of SA are the basic sounds, (i.e., phonemes) of Classical Arabic without disregarding other evident sounds as dialectal variations of the classical era. Therefore, I do not follow all the suggestions that are made by Watson (2002) and Al-Nassir (1993). I essentially depend on my own and others perceptions and articulations for the sounds of SA observing the dialectal effects on producing some of these sounds. To explain, even though Kuwaitis substitute the uvular [q] with [g] in their speech, but if asked which of the two is the correct pronunciation for ق the answer would be the uvular [q]. In contrast, even though Egyptians substitute the uvular [q] with [ʔ] in their speech but if asked which of the two is the correct pronunciation for ق the answer would be the uvular [q]. Therefore, Arabs of two different countries, who both substitute the uvular with different consonant, would agree that the correct articulation for the Arabic transcription ق is the uvular [q]. This consensus is considered a substantiation that ق is [q] not [G], [g] or [ʔ]. In addition, the letter ق is read as the uvular [q] by the expert Qur'anic readers when reciting the Qur'an. This is taken as another substantiation. In contrast to other readers, expert Qur'anic readers are trained to imitate the articulations of the classical era in reciting the holy text of the Qur'an.

Worth mentioning, Sibawaih (148-180 A.H./765-796 C.E.) illustrates in some details the sounds of Arabic phonology (see his book, Haaruun's edition, 2009, vol. 4, 431-436). He counts 42 sounds. However, he divided these 42 sounds into three groups. The first consists of 29 sounds/letter and these were introduced as 'أصل الحروف العربية' which means "the origin Arabic letters". However, to be perceived correctly in term what Sibawaih means, one can think of these letters within the Western notion of **phonemes**. Hence, these 29 letters should be thought of as the phonemes of Arabic of the classical era. Today, they are the well-known phonemes of SA and MSA. All these 29 sounds are consonants except one, that is, the Alif which donates the long vowel /aa/. The 28 consonantal phonemes that appear in Table 1.1 are my transcription for the 28 phonemes. The long back vowel appears in table 1.3 in section 1.3.1.2 which introduces the Arabic vowels.

The second group consists of mainly six sounds and are termed by Sibawaih 'فروع' *Furuuʕ* "branches". Sibawaih confirms that reciting the Qur'an and articulating poetry with these branched sounds were accepted and favoured. That they are branched that are initiated/derived, as far as Sibawaih from the 29 origin/phonemic sounds, makes them

understood as accepted and approved allophones. Two of these sounds are vowels and the others are consonants. The vowels are introduced in section 1.3.1.2, whereas the consonants are introduced in (i-iv) below.

i.   النون الخفيفة   "the light n"
ii.   الشين التي كالجيم   "ʃ which realizes like ʒ"
iii. الصاد التي تكون كالزاي   "sˤ which realizes like z"
iv.   الهمزة التي بين بين   "the glottal stop which is between between"

Al-Nassir (1993) discusses these sounds in more details introducing and evaluating Sibawaih's descriptions in English. However, due to the relevance of the segment in (iv) with the investigation that is implemented in this study the state of the glottal stop as described by Sibawaih is briefly introduced next.

Sibawaih (Haaruun's edition, 2009: vol. 3: 541-556) informs that the glottal stop /ʔ/ does not always surface in its standard phonetic value, (i.e., [ʔ]). Rather based on what he says, the glottal stop may be produced as [ii], [aa], [uu], [w], [j] and the segment in (iv). He explains that the Arabic dialects differ in this issue and are not in agreement. He also points out to the role of the phonological environments in surfacing these different realizations. Nonetheless, from his explanations it is concluded that the glottal stop /ʔ/ undergoes different processes that end up with surfacing the aforementioned phonetic realizations as allophones. These processes are (a) substitution which ends up with surfacing a long phonemic vowel, (either [ii], [aa] or [uu]) or a glide, (i.e., [w] or [j]) instead of [ʔ], (b) assimilation that ends up with surfacing the glottal stop which is between between instead of [ʔ], (c) deletion for the glottal stop without any form of compensation.

As can be seen, the phonetic values of all the realizations are known except the one in (c). The translation "the glottal stop which is between between" is not the only translation for the Arabic term الهمزة بين بين . Al-Nassir (1993: 81) informs that 'Bakalla (1970, pp. 86-87) quotes Saaran, calling this intermediate Hamzah "betwixt and between "and "intermediate". Semaan (1968, p.40) calls it "halfway articulated"'. In this thesis, I use the translation 'intermediate' instead of the literal translation that I gave when referring to this segment; hence, intermediate glottal stop/'Hamzah'. The segment intermediate glottal stop has three realizations. These realizations share a specific manner of articulation which is explained below.

When instructing how this intermediate glottal stop should be articulated in terms of manner of articulation, Sibawaih (Haaruun's edition, 2009: vol. 3, 541-542) instructs that it should be 'تخفيفها' "muted" yet it also should be 'تكون بزنتها محققة'. Lexically, the Arabic expression means that "because of its tightness it [i.e., the glottal stop] is achieved". This is understood to refer to the tightness in the chest that happens when articulating the glottal stop (see as well the page 548 in Haaruun's edition, 2009, vol.3, for more description of Sibawaih for the place of articulation of the glottal stop). In other words, Sibawaih is saying that the theoretical recognition for this sound as a glottal stop is because the place of articulation of the glottal stop is still perceived. Other descriptions for this realization are 'غير أنك تضعِّف الصوت و لا تُتِمّه و تُخْفي'. This means that this realization of the glottal stop is weak, uncompleted and hidden. From this I conclude that there is no audible release for this intermediate Hamzah/glottal stop.

As for the difference between the three realizations of the intermediate glottal stop, Sibawaih's instructions indicate that it is centred on the phonetic component of the realizations. The first realization is perceived as an intermediate sound between the glottal stop and the phonemic vowel /aa/. The second is perceived as an intermediate sound between the glottal stop and the phonemic vowel /uu/. The third is perceived as an intermediate sound between the glottal stop and the phonemic vowel /ii/. These perceptive differences are conditioned in terms of the phonological environments in which the underlying glottal stop is surfacing on. For instance, an environment of the first realization is /aʔa/, for the second is /aʔu/ and for the third is /aʔi/. Notably, Sibawaih's data and illustrations continue explaining what confirms that the type of vowel that is preceding and following is the reason behind the difference in realization. In addition, he gives data that show that phonologically these environments are not restricted to word boundaries (see: p. 542).

Nonetheless, considering the descriptions that are given, I think that what is being described by Sibawaih is a glottalization of vowels. This thinking differs from Al-Nassir (1993: 82) who presents the three realizations of intermediate glottal stop as one segment and suggests that it 'is articulated like a weak glottal fricative'.

On the other hand, that there are three realizations of intermediate glottal stop suggests that we are not dealing with an allophone of the glottal stop; rather we are dealing with a phoneme. As far as I see from Sibawaih's descriptions, the Arabic dialects of the classical era differed in terms of how the standardized glottal stop surfaces in their mother tongues. Banuu Tamiim, for instance, are presumably will not surface the intermediate glottal stops in contrast to people of Hiʒaaz. This is because contrary to people of Hiʒaaz, the Arabs

of Banuu Tamiim are categorized among those Arabs who 'يحقق' "surface" the glottal stop normally. I did not, however, pursue all Sibawaih's dialectal descriptions in terms of who surface the glottal stop as [ʔ] and who do not.

The third group consists of 8 sounds which Sibawaih classifies as the un-favoured. He informs that these sounds do not appear a lot in the language of those Arabs whom their Arabic is accepted. All the 8 sounds are consonants as can be seen below. For more details about these sounds see Sibawaih's book and Al-Nassir (1993).

i.	الكاف التي بين الجيم والكاف	"the k which is between ʒ and k"
ii.	الجيم التي كالكاف	"the ʒ which is like k"
iii.	الجيم التي كالشين	"the ʒ which is like ʃ"
iv.	الضاد الضعيفة	"the weak dˤ"
v.	الصاد التي كالسين	"the sˤ which is like s"
vi.	الطاء التي كالتاء	"the tˤ which is like tˤ"
vii.	الظاء التي كالثاء	"the ðˤ which is like θ"
viii.	الباء التي كالفاء	"the b which is like f"

1.3.1.2 The vowels in Arabic phonology

Similarly, this subsection begins by introducing the standardized vowels. Following this other vowels in both the modern era and classical era are introduced.

The Table 1.3 below introduces the phonemic vowels in SA. These vowels are also phonemic in Classical Arabic. As far as I know, they are still phonemic in the modern Arabic dialects. That said, there are some literature that claims that the long vowels in Moroccan Arabic are not distinctive as phonemes (see: Boudlal, 2009: 19-20). If this turned to be true then this is a major phonological change. However, Heath (2002: 191) in contrast to Boudlal (2009), displays more caution by saying 'I cannot rule out, however, the possibility that systems of three short and three long V's {i a u ii aa uu} may be authentic in at least some MA dialects'. This study investigates the CVCC stems in Marrakesh Moroccan Arabic; hence, it cannot contribute much on this issue. Nonetheless, both Classical Arabic and modern Arabic dialects have other vocalic sounds than the standardized as will be seen.

ALT	IPA	Description
◌َ	a	open back
◌ُ	u	close back round

ِ	i	close front
ا	aa	open back tense
و	uu	close back round tense
ي	ii	close front tense

Table 1.3: The phonemic vowels in SA

The modern Arabic dialects exhibit other vowels. The ones that I think they have a confirmed statue are the long monophthong /oo/ and /ee/, and the monophthong schwa /ə/. However, not all modern Arabic dialects exhibit these vocalic sounds in their segmental systems, and I am not sure whether they can be considered as phonemes. Yet, it is observed that Hamid (1984) includes both /oo/ and /ee/ among the vowel system of Sudanese Colloquial Arabic. Therefore, if accepting Hamid's establishment about /oo/ and /ee/ then the phonemic statue of these two sounds in Sudanese Colloquial Arabic can be confirmed. The evolution of these two sounds is of interest for this study. Hamid (1984) gives an interpretation for their evolutions which I do not agree with because of what I know about the vowels of Classical Arabic. Hamid's (1984) interpretation is reviewed in chapter three in this thesis, thus to avoid the repetition I will not pursue his work here. As for the schwa /ə/, Boudlal (2009: 19) introduces it in the vowel system of Moroccan Arabic between parentheses 'to denote its epenthetic status.' The literature that is focused on the modern Arabic dialects claims other vocalic segments. For instance Boudlal (2009: 20) acknowledges allophonic vowels such as [i], [ɪ] and [ɨ] in Moroccan Arabic. However, I will not pursue such details.

On the other hand, as said before basing on Sibawaih, there are favoured vocalic sounds which are produced in the classical era that differ from the standardized vowels which appear in Table 1.3 above. Notably, however, even though Sibawaih's terminologies indicate that these favoured vowels are mainly two allophones for one vocalic segment, (i.e., the long back Alif /aa/) but his illustrations, which include data, show that his terminologies are not appropriate, at least not for (ii). This is because Sibawaih's illustrations introduce allophones for /aa/, /uu/, /a/ and /u/ and not mainly /aa/. The following are his terms and my suggested literal translations for these terms.

i.   ألف التفخيم   "the emphatic aa"

ii.   الألف التي تمال إمالة شديد   "the aa which undergoes intense *Ɂal-Ɂimaala/assimilation*"

Starting with the vowel in (i), this is, *Alif Ɂat-tafxiim*. Al-Nassir (1993: 19), introduces this Alif sound as 'slightly backed and raised towards the close back vowel /u:/, having the

12

phonetic value [o:]'. Al-Nassir (1993: 103-104) makes this suggested phonetic value based on the Uthmaanic outline, the first official transcription of the holy Qur'an (before 47 A.H. /656 C.E.) and the words which Sibawaih gives as an example for *Alif ʔat-tafxiim*. However, the contrast between the Arabic transcriptions shows that the suggested phonetic value [o:] is not correct, in particular if considering the known pronunciation of the words (see the table 1.4 below).

The meaning of words	Sibawaih's transcription for the words	The Uthmaanic transcription for the words	Standard transcription for the words
The praying	الصلاة [ʔasˤ-sˤal**aat**-V]	الصلوة [ʔasˤ-sˤal**aat**-V]	الصلاة [ʔasˤ-sˤal**aat**-V]
The Zakat	الزكاة [ʔaz-zak**aat**-V]	الزكوة [ʔaz-zak**aat**-V]	الزكاة [ʔaz-zak**aat**-V]
The life	الحياة [ʔal-ħaj**aat**-V]	الحيوة [ʔal-ħaj**aat**-V]	الحياة [ʔal-ħaj**aat**-V]

Table 1.4 A contrast in the transcription of three words

To explain, Sibawaih gives three words as examples for the *Alif ʔat-tafxiim*. These words appear in the second column in table 1.4. The Arabic transcription of these words is as appears in my edition of Sibawaih's book, (i.e., Haaruun's edition, 2009: 432) whereas the translations are my suggestions. The Uthmaanic outline, which appears in the third column, transcribes these words differently not only from Sibawaih's transcription but also from the standard transcription. Note that the distinct between the Arabic transcriptions of the same words is mainly in transcribing one sound, this is, the boldfaced **[aa]**. In Sibawaih's book it is transcribed as ا in the three words whereas in the Uthmaanic outline it is transcribed as و. According to the standard orthography, (i.e., the fourth column), it is Sibawaih who is offering the correct transcription for the segment /aa/ as the symbol و refers to the segments /uu/ and the glide /w/. The Uthmaanic outline usually transcribes /aa/ as ا , hence just like Sibawaih and the standard orthography of /aa/. Thus, the Uthmaanic transcription of these three words is of significance. This significance is unknown until today even though attempts have been made to find out the reason behind transcribing these words differently in the Uthmaanic transcription. As far as I know, the proposed explanations that resulted from these attempts have not been verified yet.

Nonetheless, Al-Nassir argues that because the Uthmaanic outline transcribes /aa/ in these words as و then Sibawaih, who is giving these words as data for *Alif ʔat-tafxiim*, is indicating that *Alif ʔat-tafxiim* has a rounding feature. His reasoning makes him assumes that *Alif ʔat-tafxiim* is not [aa] but [o:]. Critically, Al-Nassir's assumption that /aa/ in these words is pronounced with a rounding feature might be a correct explanation for the significance of the Uthmaanic transcription. However, considering Sibawaih's own transcription of the three

words in his book, I do not think that the rounding feature is what Sibawaih was referring to. Moreover, the adjective "التفخيم" ʔat-tafxiim, which Sibawaih is using to describe the vocalic sound Alif /aa/, has the lexical meaning 'grand' and 'height'. Furthermore, terminologically, this adjective is used in ALT to refer to the emphatic consonants in addition to other guttural sounds which is an information Al-Nassir (1993: 103) acknowledges. Therefore, I think that the feature, which Sibawaih was trying to explain, is the Pharyngealization. Hence, the Alif vowel /aa/ in Sibawaih's transcription is most probably produced as [aaˤ] not [o:] as argued by Al-Nassir.

Sibawaih's term for the vowel in (ii) above informs that we will be dealing with another realization of Alif /aa/ which differs because it undergoes intense ʔal-ʔimaala/assimilation. Specifying /aa/ and excluding all other phonemic vowels does not match with Sibawaih's own illustrations for what is ʔal-ʔimaala process. This is because other vocalic segments undergo ʔal-ʔimaala are mentioned in his illustrations. Next, this process is introduced critically as appears in Sibawaih's book (Haaruun's edition, 2009: vol.4 117- 144) and Al-Nassir (1993: 91-102).

The Arabic term الإمالةʔal-ʔimaala is presented by Al-Nassir (1993: 91) by alluding that lexically the term is 'derived from mayl (inclination, shift) is used in Arabic linguistics to denote displacing an element in the direction of another in regard to places of articulation'. As can be understood form Al-Nassir's words the term refers to a specific process that is related to the articulation. However, Al-Nassir's words need to be corrected so that they become more precise. Firstly, it is not an element; rather it is a vowel, and not any vowel rather only four specific phonemic vowels based on Sibawaih's illustrations. Secondly, I suggest the terminological expression *vocalic features* instead of *the place of articulation* because it is thought more appropriate with WL establishments and Sibawaih's descriptive illustrations. Thirdly, the process should be understood as an 'inclination' for the vowel not a 'shift' as this understanding is compatible with Sibawaih's illustrations and the lexical meaning of the term ʔal-ʔimaala.

On the other hand, even though I agree that ʔal-ʔimaala is 'a type of Idghām' just as said by Al-Nassir (1993: 91), but in contrast to him I do not think that Sibawaih thinks of ʔal-ʔimaala as 'a type of Idghām'. It is true that Sibawaih mentions 'Idghām' but this is done mainly to refer to a process that he views as a similar process to ʔal-ʔimaala. The Arabic term 'Idghām' means assimilation (see section 2.3 in chapter two). The known types of 'Idghām' demonstrate that it is a process of consonantal assimilation. Contrary, the types of ʔal-ʔimaala, which are explained by Sibawaih, show that it is an assimilation process that affects

mainly specific phonemic vowels. In addition, his descriptive illustrations imply that ʔal-ʔimaala is incomplete assimilation, whereas 'Idghām', as far as I know, consists of both types complete and incomplete consonantal assimilation. In other words, ʔal-ʔimaala involves mainly assimilation in vocalic features. The specific phonemic vowels that undergo the vocalic assimilation ʔal-ʔimaala are /aa/, /a/, /u/ and /uu/ and not mainly /aa/. Both Al-Nassir (1993) and I agree on this segmental specification for those vowels that undergo ʔal-ʔimaala. However, Al-Nassir does not comment on the mismatch between Sibawaih's term, which specifies mainly /aa/, and his illustrations.

In relation to how does Sibawaih use the term ʔal-ʔimaala, Al-Nassir (1993: 91) says that 'Sibawayh usually uses this term to firstly refer to certain degree of closing and fronting of the pharyngeal vowels Alif /a:/ and Fatḥah /a/ to a position halfway between theirs and that of the palatal vowels Yāˈ /i:/ and Kasrah /i/ respectively'. I agree with Al-Nassir (1993) in this and I conclude that the two sounds that result from the feature assimilation most probably would have the feature [+close-mid]. It is concluded as well that they would differ in terms of the feature [tense], as one of them is long whereas the other is short. Al-Nassir's suggested transcriptions for these two vocalic described sounds, (i.e., [ee] and [e]) are adopted in this study.

On the other hand, Al-Nassir (1993: 91 & 102) says that Sibawaih uses the term ʔal-ʔimaala to refer to another vocalic assimilation that involves assimilating 'a certain amount of fronting' which the two vowels /uu/ and /u/ undergo. The articulation of the vowels that results from this fronting assimilation is described by Sibawaih through a usage for verbal forms of two terms commonly are used to describe the realizations of the final-vowels in a pausal word. The first is the verb 'يُشِمُّ' (Haaruun's edition of Sibawaih, 2009: 119). This verb is derived from the term إشمام ʔishmaam which refers to a specific characteristic of the rounding in the articulation of /u/ and /uu/ when being final in a paused word. It informs that the rounding of lips can be seen visually but an ear is unable to perceive these two vowels (see: for more details Alkhatiib 2003, vol. 11: 41-42). From this it was concluded that the fronted /u/ and /uu/ still preserve the feature [+round].

Sibawaih makes a use of a verbal form of another term in his descriptive illustrations. The term is also known to be conclusive for describing the articulation of the vowels /u/, /uu/, /ii/ and /i/ when being realized word-final in a paused word. The verbal form which he uses is 'تروم'[ta-ruum] (Haaruun's edition, 2009: 143). This verb is a verbal usage of the term روم Rawm which is used to inform that the articulation of the vowels /u/, /uu/, /ii/ and /i/ word-finally is shorter than their typical length when this word is a sentence-final, (i.e., pausal

position). However, Sibawaih mainly verbalizes الكسرة kasrah which refers to mainly the short /i/. Nonetheless, because his data show that both /i/ and /ii/ undergo the shorting in the typical duration of articulating them, he is perceived to refer to both counterparts vowels; the short and long front close vowels.

Accordingly, it is concluded that both /u/ and /uu/ assimilate to /i/ and /ii/ in specific vocalic features. The assimilation, (i.e., ʔal-ʔimaala) results in two different vocalic sounds; the first has the following features [+round], [+central], [+high] and [-tense] whereas the second has the features [+round], [+central], [+high] and [+tense]. However, these two vocalic sounds differ from the phonemic vowels in terms of the duration of articulation. Both of them, the short and the long, based on Sibawaih's description are shorter than the long and short phonemic vowels.

Nonetheless, Al-Nassir's (1993: 102) conclusions from Sibawaih's descriptions drove him to suggest that these two vowels are 'possibly in the region between /u/ and /μ/. For convenience the symbols [μ] and [μ:] will be used to represent the phonetic values of the allophonic variants of /u/ and /u:/ respectively'. Upon checking the cardinal vowel chart in the IPA system, I did not find the symbol [μ] introduced. Therefore, I did not adopt Al-Nassir's symbols. Examining the cardinal vowel chart makes me think that the two vowels most probably are central, (i.e. [ʉ] and [ʉʉ]). The reason behind selecting the central is that Sibawaih is not describing a complete fronting. Therefore, he is not saying that the round [u] and [uu] are becoming [i] and [ii]. Rather, as Al-Nassir says, the assimilation is mainly in 'a certain amount of fronting'.

In terms of the states of these sounds, (i.e., [e], [ee], [ʉ] and [ʉʉ]) I agree with Al-Nassir (1993) in understanding that they are allophones.

There is also an example given by Sibawaih that made some suggests that ʔal-ʔimaala results in a diphthong as well. Al-Nassir (1993: 94):

> He states that if an Alif in final position undergoes Imālah for any reason, the process might leak to converting this Alif into a semi-vowel Yāʾ. He comments that when pausing on the noun /afˤa:/ (a snake) some speakers realize it [ˈafˤey]. His explanation is that when Alif undergoes Imālah and is paused on, it will be *Abyan* (more conspicuous) if it is realized as a semi-vowel Yāʾ.
> It is possible that the final combination –ey is the outcome of two transformations. In the first the Alif undergoes Imālah which changes its phonetic value into [e:]. The second is dipthongizing[sic] this allophone into [ey] because it occurs in final position. (cf. Schane, 1973, p.58).

This is a possibility that is worth consideration. Nonetheless, the data that appears in the quotation are re-transcribed based on the symbols of this study so that it is perceived

correctly guided with the sounds descriptions that appear in the tables of this section. The underlying form of '/afˤaː/ (a snake)', which is presented by Al-Nassir, is /ʔafʕaa/ whereas the surfaced form '[ˈafˤey]' is [ʔafʕey]. For clarification, [y] is a symbol of the close front vowel. However, I argue that there is another possibility that might be concluded from Sibawaih's descriptive illustrations. This is that he is not describing ʔal-ʔimaala, (i.e. assimilation process) rather he is describing الإبدال ʔal-ʔibdaal, (i.e., a substitution process). The reason that puts this possibility for consideration is that Sibawaih does not say that the speakers make the Alif close to 'Yā'' rather he literary says they made it 'Yā''. Al-Nassir's following words in the above quotation are emphasised 'the process might leak to converting this Alif into a semi-vowel Yā'' display that he perceives the distinction that I note in Sibawaih's selection of words. Yet, Sibawaih's sentence that follows in his text makes me uncertain as it seems to be giving the privilege for the first possibility, (i.e., the diphthong realization). On the other hand, if it turns out that the substitution possibility is the correct, then as a consequence the correct transcription for the surfaced forms of /ʔafʕaa/ are either [ʔafʕaj] or [ʔafʕii].

There are clues that show that indeed the long /aa/ is substituted with either the long front [ii] or [j]; hence the surfaced form is [ʔafʕii] or [ʔafʕaj]. These clues appear in Sibawaih's book (Haaruun's edition, 2009, vol. 4: 181-182). These specific pages are part of the chapters in which Sibawaih introduces a strategy of marking some pausal forms. The example which Sibawaih bases his illustration on is the discussed word in the quotation above, (i.e., /ʔafʕaa/). Sibawaih, in contrast to his brief words in ʔal-ʔimaala chapters illustrates more and gives more data that gives more insight about the realizations of the word /ʔafʕaa/ in his classical era. In addition, orthographically, the Arabic editor of my edition of Sibawaih's book transcribes this word as 'أَفْعَئْ'. The significance in the editor's transcription is the diacritic ˚, which in Arabic orthography refers to سكون sukuun. The Arabic term sukuun may mean a realization of a long phonemic vowel or a consonant that is not followed with vowel. Since sukuun ˚ is on the Alif Al-maqsˤuura symbol, (i.e., ى) not Alif mamduuda (i.e., ا) then the transcription ئ can be read as either [ii] or/and [j]. Thus, it is more probable that Sibawaih was intending either [ʔafʕii] or [ʔafʕaj]. There is even a good possibility that he was intending both as this is a common practice. On the other hand, there is another realization of the same word, (i.e., /ʔafʕaa/) that Sibawaih attributes it to some people of Tˤajʔ. The Arabic transcription of their pronunciation based on Haaruun's edition is 'أَفْعَوْ'. Because of the Arabic transcription it may be read as either [ʔafʕuu] or [ʔafʕaw]. This is because sukuun is on و. The symbol وْ refers either to [uu] or a [w] that is not followed with a vowel. However,

Sibawaih's terminology is more specific this time as he used the term المد which is used to refer to mainly the long vowel. Thus, the pausal realization of /ʔafʕaa/ that is attributed to some Tˤajʔ can be confirmed to be [ʔafʕuu].

Accordingly, the segments that results from the vocalic assimilation in the classical era are [ee], [e], [ʉ], [ʉʉ], [uu], and possibly one of the following [ii], [ey] or glide [j]. As for the triggers for *ʔal-ʔimaala*, until now only /i/ and /ii/ are mentioned. However, as noted by Al-Nassir (1993: 93), Sibawaih advises that the glide /j/ can be a trigger. An example for this is: /raʔaj-tu jada-haa/ → [raʔaj-tu *j*ada-h**ee**] 'I saw her hand'. The open back vowel /aa/ surfaces as a long close-mid vowel [ee] because of the word-initial palatal [j]. Clearly, even though there are four segments that intervene between the trigger [j] and the trigged [aa] but these segmental intervened between them did not block *ʔal-ʔimaala*. This does not mean that this vocalic assimilation process never gets blocked in its typical phonological environments. Rather, Sibawaih points out that there are consonants that block this assimilation process; these include /sˤ/, /x/, /dˤ/ and /tˤ/. Nonetheless, the emphasis here is that *ʔal-ʔimaala* is a vocalic assimilation in terms of the trigged segments not the trigger segments. This is because triggers for *ʔal-ʔimaala* are /i/, /ii/ and /j/ whereas the trigged segments are the vowels /aa/, /a/, /u/ and /uu/.

In terms of the environments in which *ʔal-ʔimaala* occurs in, Sibawaih gives details. However, only the following phonological environments are given as examples below without specifying the dialect that produces each of them.

1. Assimilating /aa/ to [ee] when there is /i/ or /ii/ in the structure:
1a. /ʕaalim-u-n/ → [ʕeelim-un]   "a scientist.Nom"
1b. /mafaatiiħ-u/ → [mafeetiiħ-u]   "keys.Nom"
2. Assimilating /uu/ to [ʉʉ], and /u/ to [ʉ] when there is /r/ followed with /i/ in the structure
2a. /maðʕuur-i-n/ → [maðʕʉʉr-i-n]   "scared.Gen"
2b. /ʔal-munqur-i/ → [ʔal-munqʉr-i] "The well that has plenty of water"
3. Assimilating /a/ to /e/ when there is /r/ followed by /i/ in the structure
3a /ʔal-matˤar-i/ → [ʔal-matˤer-i]   "the rain.Gen"

As far as Sibawaih's description and data, the process seems to be also conditioned syntactically for some Arabs. In that, Sibawaih mentions that some Arabs contextually display *ʔal-ʔimaala* when a word marked with the vocalic genitive marker, hence /i/ but not when the same word is marked with the vocalic accusative /a/ and nominative /u/. Clearly, the phonetic value of the genitive case is the responsible on triggering the assimilation. Among the observations that he makes regarding this phonological-syntactical environment of assimilation is that the vowels that result are أضعف "weaker". It is not necessarily to trigger

the assimilation that the genitive /i/ is marking the word, rather it might be marking a preceding word. Some Arabs, according to Sibawaih, display the assimilation process cross boundaries, but he points out that such *ʔal-ʔimaala* is less common (Haaruun's edition, 2009: vol. 4, 123).

Another syntactical-phonological environment is the pausal position and the contextual positions in a sentence. The nutshell of what Sibawaih says regarding this is that the Arabs differed around this. In the following specified pages that I consulted (Haaruun's edition, 2009, vo.4: 117-182), Sibawaih was found mentioning three variations. The first variation restricts *ʔal-ʔimaala* process to pausal forms. Another variation blocks *ʔal-ʔimaala* in pause and restricts it to context forms. The third variation is of Arabs who operate *ʔal-ʔimaala* in pause and in context.

Overall, the deduction that is inferred is that *ʔal-ʔimaala* is a vocalic assimilation that Arabic phonology employs to achieve vowel harmony in the structure of a word. The vowels harmonise in a single word to share specific features. I have to mention that how Arabic phonology employs this vocalic assimilation in the modern Arabic dialects is unknown for me. Another point that should be emphasised is that Sibawaih does not explain his act of mentioning only /aa/ in one position of his book as the vowel that undergoes *ʔal-ʔimaala* (Haaruun's edition, 2009, vol. 4: 432) whereas in other position the four vowels that undergo *ʔal-ʔimaala* are mentioned (Haaruun's edition, 2009, vol. 4: 117-144).

On the other hand, the literature on the phonology of Classical Arabic displays mistakes and errors. The most astonishing are (i) the claim that it has mainly three vowels. I have experienced works recently published introduces this incorrect information. Another noticeable mistake in the literature is that the glides in some structures are introduced as diphthongs in the transcription and in referring to them which causes confusion.

Finally, in relation to the vocalic segments that are observed in some modern Arabic varieties, (i.e., [ee] and [oo]), I have the following to say. Whereas clearly [ee] is an evaluation from *ʔal-ʔimaala* which /aa/ underwent, the vowel [oo] is a question in terms of its origin. It might be that [ʉʉ] with time became [oo] or that it might be a different sound resulted due to different circumstances. Hamid's (1984) interpretation for the origin of [ee] and [oo] will be discussed in chapter three.

1.3.2 The transcription of Arabic terminology, names and expressions

Generally the Arabic terminologies and names that appear in the pages of this thesis are transcribed based on the aforementioned symbols. However, I was not systematic in this.

Yet, consistency in transcribing a name was ensured, yet one needs to be alerted that a name or a term may appear in quotations in a different transcription.

1.4 The translation of Arabic expressions and texts

Be acknowledged that the Arabic texts/words when translated by me then the translation would be between double inverted commas. Yet, be aware that in quotations the inverted commas are used by the authors.

Finally, I follow the mentioning of THE GOD with the glorifying expression ﷻ whereas the mentioning of the Prophet Muhammad is followed with the expression ﷺ. The expression ﷻ is among several equivalent expressions which Muslims normally transcribe to display their respect and obedience to THE GOD ﷻ. Continually in this thesis the mention of THE GOD ﷻ is to be followed by the expression (ﷻ). The translation that was found through using Google translation engine is 'Almighty'. However, upon checking the definitions that are suggested for the word 'Almighty' in Longman dictionary (2006: 40), I decided to offer another suggested translation that is compatible to the lexical meanings of the Arabic words in the expression. This translation is: "to the greater power, pride, honour and glory."

As for the expression ﷺ, It is obligatory within the Islamic faith to ask for the salutations and prayers of THE GOD ﷻ upon the Prophet Muhammad ﷺ whenever he is mentioned. In verse (56) in chapter (33) ʔal-ʔaħzaab THE GOD ﷻ says:

﴿إِنَّ اللَّهَ وَمَلَائِكَتَهُ يُصَلُّونَ عَلَى النَّبِيِّ يَا أَيُّهَا الَّذِينَ آمَنُوا صَلُّوا عَلَيْهِ وَسَلِّمُوا تَسْلِيمًا﴾

The suggested translation of this verse is "Indeed, Allāh confers blessing upon the Prophet, and His angels [ask him to do so]. O you who have believed, ask [Allāh to confer] blessing upon him and ask [Allāh to grant him] peace' (Saheeh International, 2013: 415). The expression (ﷺ) consists of the words that express the ask for the salutations and prayers of THE GOD ﷻ upon the Prophet Muhammad ﷺ.

Chapter 2
Foundations
Case inflections in the Arabic language

2.1 Introduction

Perhaps the most notable linguistic characteristic that distinguishes what is usually referred to as Classical Arabic from what is classified today as the modern Arabic dialects is that the latters do not have an overt case system. The exception for this statement, however, is MSA, as this still preserve, to great extent, the same morphological richness of its ancestor. This is well-known in the WL research that is deemed as the Arabicists' research and is supported by sources like Blau (1981); Fück (1950, Arabic translation 2006), Corriente (1971; 1973) and Owens (2006) among many others. The term *case* is a WL establishment term, thus identifying what is case inflections in the Arabic language is really a work has been done by those Arabicists in their linguistic research and the grammar handbooks that were designed for learners of the Arabic language.

Accordingly, based on sources such as Ryding (2005: 54) the case system in the Arabic language is acknowledged to mark: nominative, accusative and genitive relations. In addition, it is acknowledged that the marking does not only appear on nouns, but it also appears on participles, adjectives and, to some extent, adverbs. Moreover, the case marking occurs through suffixes. This study is concerned mainly with the case marking by short vowel suffixes, (i.e., /-u/ nominative, /-a/ accusative and /-i/ genitive). These short vowels typically appear at the very end of last syllables of definite nominal words. For indefinite nominal words, these markers normally are placed before the indefinite marker; that is, the final nasal /-n/. The reason behind the interest with these short vocalic markers in particular is because there are epenthetic vowels in the modern Arabic dialects that uniquely resemble the lost vocalic short case markers. The resemblances indicate that there is a relationship between the two types of short vowels; the lost and the emerged. However, more details about this study that include its objectives, hypothesis and rationales are introduced in chapter three.

This chapter provides a fundamental background of the basics of what are the case inflections in the Arabic language. This is done through explaining the phonetic values of the case inflections and pointing out to the distinction between the two terms used to refer to these morpho-syntactic vowels in ALT and WL. These terms are إعراب *ʔiʕraab* and *case*. In addition, two phenomena are introduced because of their clear relationship with the loss of

the case inflections. These phenomena are الوقف "the pausing" and الإدغام "the assimilation" phenomena.

Structurally, this chapter is divided into four main sections. The following section introduces the case marking system in Arabic in terms of the phonetic values of the case inflections. The third section focuses on two phenomena which are documented in the original Arabic sources and perceived in the Qur'anic readings. This section is the breadth section in this chapter as it consists of three subsections. They all contribute to build a background that is supposed to present foundations of the phonological and syntactical situations in the classical era that led at the end to the disappearance of the case markers in the Arabic language. Finally, a conclusion is given.

2.2 إعراب *Piʕraab* and case

This section presents an outline for the conceptual distinction between the ALT term إعراب *Piʕraab* and the WL term *case* depending on how Ryding (2005) introduces the grammar of MSA. This is done to provide readers with a general concept they can rely on whenever the ALT term is used in this study.

The ALT term إعراب *Piʕraab* technically expresses a *process* in which a word, which functions as العامل "syntactic governor", assigns a specific علامة "marker" that carries certain values of meanings to another word(s) in a sentence. This theoretical understanding for the إعراب *Piʕraab* can be traced to the eight century as it appears in Sibawaih's (d. 180 A.H. /796 C.E.) book. Furthermore, it is still the active and the effective approach for case and mode inflection in the ALT field of research. Even though there are other models of approaches for the *Piʕraab* inflections but these are not active today in ALT.

On the other hand, from Ryding (2005: 56) present the إعراب *Piʕraab* inflections within WL terminologies as the combination of the inflectional categories of *case* and *mode*. Accordingly, the emphasis here is that readers should be aware of the fact that the terms إعراب *Piʕraab* and the *markers of* إعراب *Piʕraab*, (i.e., *Piʕraab* inflections) are broader than the terms *case* and *case markers*, (i.e., case inflections).

The hypothesis of this study is generalizing in the scope of its assumption around *the Piʕraab* as *markers/inflections*, in particular the short vocalic ones of them. Hence, in WL terminologies, the scope of the assumption is around both the case and mode markers/inflections. However, only the case marking system is introduced next. This is because in contrast to the scope of the basic assumption of the hypothesis, (i.e., *the evolution of CVCC syllable type in Arabic is due to the loss of* إعراب *Piʕraab)*, testing the hypothesis involves mainly the nouns with underlying CVCC. Therefore, the narrow scope of the test in

contrast to the broadness scope of the thesis of the hypothesis is the reason for introducing mainly the category *case* of the إعراب *ʔiʕraab* here. Thus, the distinction between the terms is made to fix the hypothesis of this study and the tested part in terms of what is assumed and what is found.

Note that the term إعراب *ʔiʕraab* is already adopted in the Arabicist research to refer to both case and mode inflections. Therefore, it is not new term in WL for those of knowledge with the Arabicists research. However, considering the theoretical nature of this thesis, it is assumed that who reads it may not be familiar with the work of the Arabicists. Thus, introducing the distinction is mainly a consideration for theorists who are unaware of the term.

Another reason for introducing the distinction is because it is noticed that generally in the Arabicists research the term إعراب *ʔiʕraab* is used to refer to the case inflections more than to refer to mode. For example, Corriente (1971 & 1973) tests mainly the case inflections in Arabic but refers to them within the broad Arabic term إعراب *ʔiʕraab*. Thus, stating what is assumed and what is found is for clarity and to be precise.

The case marking in Arabic consists of the following inflections:

a. The short vocalic markers are case morphemes /-a/, /-u/ and /-i/ that mark accusative, nominative and genitive relations. They respectively mark wide forms of nominal words in the Arabic languages that possess case system, (i.e., Classical Arabic, SA and MSA). These nominal forms include singular forms and broken plural forms. Feminine sound plural forms are also marked by these vocalic markers but, interestingly, the phonetic value /-a/, is not employed to mark accusative. Instead, in this type of nominal forms one finds that the phonetic value /-i/ marks morpho-syntactically both the genitive and accusative grammatical relations. Hence, the feminine plural forms are marked by only two phonetic values of the three short vocalic markers.

b. The phonetic values /-uun/ and /-iin/ are case suffixes that mark accusative, nominative and genitive in masculine sound plural forms of words. Whereas the phonetic value /-uun/ marks the nominative relations, the phonetic value /-iin/ marks the genitive and accusative grammatical relations.

c. The phonetic values /-aan/ and /-ajn/ are case suffixes that mark only in the dual forms. The nominative relation is marked by /-aan/ whereas the genitive and accusative relations are marked by the phonetic value /-ajn/.

d. The long vowels /-uu/, /-aa/ and /-ii/ are case suffixes that mark *only* six nominal words.

This brief description for the markers in terms of their phonetic values and the grammatical relations that these values assign are thought to be sufficient for the purpose of this chapter. Yet, occasionally and in specific sections, some new information about these markers, depending on the argument that is being addressed, may occur in the thesis.

On the other hand, the above description shows that WL confirms the theoretical establishments that were made in ALT about the case marking in Arabic. For instance, it affirms that Arabic has a case inflectional system of mainly three distinctive grammatical case markings. These are referred to within the following Arabic terminologies مرفوع Marfuuʕ, منصوب Mansˤuub and مجرور Maʒruur. It is, therefore, noticed that WL research preserves the same three-analytical taxonomy which is developed by the early grammarians of ALT when referring to the grammatical case relations in Arabic. The terminologies that are used as equivalent for the Arabic terms are the nominative, accusative and genitive cases. Theoretical justifications for the adoption of this three-analytical taxonomy were not found in the consulted Arabicist research, (e.g., Ryding 2005, Corriente 1971; 1973, Fück 1950/2006 and Owens 2006).

2.3 The الوقف "pausing" and the الإدغام "assimilation" phenomena

This section introduces two phenomena documented by the early grammarians of ALT. The observer for these two phenomena can infer their direct relationship for the loss of the marker. The first phenomenon is termed in the original Arabic sources as الوقف *Al-Waqf* "The pausing," whereas the second is termed الإدغام *Al-ʔidɣaam* "The assimilation". The Arabicists are found recognizing that there is a relationship but their approaches for the phenomena were thought insufficient because they do not light all the aspects of these two phenomena and make mistakes.

Structurally, the first subsection introduces the two phenomena. The second summarizes what were found in the consulted works of the Arabicists regarding these two phenomena. The last subsection presents a critical evaluation for Arabicists' conclusions and comments.

2.3.1 Pausing and assimilation; terms and concepts

The two phenomena, (i.e., *Pausing* and *assimilation*) are introduced in brief next. The main target is to describe these two phenomena within a frame of specific terminologies and concepts that illustrates their essences. Few examples are provided as data that display these two linguistic phenomena. Another target is presenting an evaluation of what are said about these two phenomena in some Arabicists research.

2.3.1.1 Al-Waqf /The pausing

The Arabic term *Al-Waqf* is translated to English as *pausing* in this study. I follow Arabicists' research in this conduct. This phenomenon is related to a word-position in a flow

of utterance. The different realizations of words that occur in a pausal position are termed *pausal forms*. The contrasted type is the realizations of words in the other positions in a stream of utterance. These are referred at with the term *contextual forms* or *non-pausal forms*. The pausal forms and contextual forms of Arabic have been acknowledged in different Western fields of research. For example, some Arabicists have already approached this phenomenon (e.g., Corriente 1971; 1973; 1976 though in very brief, Birkeland 1940 as appeared in Owens 2006 and Owens 2006). In theoretical phonology, McCarthy (2011) presents an account for different types of pausal forms in Classical Arabic.

Typically, the position of a pausal form is *the end of a sentence.* Whether this sentence is forming an utterance of a word or more, the pausal form is the last word pronounced in it. Observe that if a sentence was a unit in an utterance that consists of a collection of sentences of different kinds (e.g. declarative, exclamation and interrogative sentences) the pausal word is the last word of each of these units. Thus, in reality, pausing is a structured phenomenon that has a syntactic-sematic function, (i.e., it marks a sentence regardless of its type). However, overtly, speech is a human practice linked generally to speakers' intentions and actions. Thus, a non-regular pattern of pausing positions may be practiced by humans. The need for air, for instance, in a long speech may enforce a speaker to pause. In addition, a speaker may make an emphasis through pausing in a non-paused position. Nonetheless, in Arabic, the two types, (i.e., the regular pausing and irregular pausing) exhibit the same structures morpho-phonologically. Thus, in this study, the distinct between them is not considered, as the focus is centred on the phonological and morphological aspects of these structures. The examples below display some typical pausal-positions and contextual forms.

1. ʕalijj-u-n   naama   nawm-a-n   **ʕamiiq-a-n**
 Ali.Nom.nunation   slept   sleeping.Acc.nunation   deep.Acc.nunation
"Ali had a deep sleeping"

2. Man   **(ʔ)al-muʕallim-uuna**   "Who are the teachers?"
  Who   the.teacher.Plur

3. **ʕalij-u-n**   "Ali!"
  Ali.Nom.Nunation

4. Fataħ-ti   **ʔal-baab-a   Kajfa**   "You opened the door! How?"
  Opend.you.Sing.Fem   the.door.Acc   How

The words that are boldfaced are the typical syntactic positions in which a pausal form is expected to occur, that is, *a final position* of a sentence. Hence, a pausal form is a

sentence-final in terms of its position. The contextual forms are the rest of the words that appear in other positions. The *final position* which, a pausal form occurs in, needs to be comprehended within an agreed upon definition. This definition holds the characteristics of pausing. This can be inferred from observing the data above.

To explain, the example (1) shows that the fourth word in an utterance, which consists of four words forming a sentence, is the pausal position. Example (2) shows that because the second word is sentence-final in the utterance it is the paused one. Example (3) shows that if an utterance consists of mainly one word, then this word is in the pausal position. The utterance that appears in example (4) is different because it contains of two sentences. Thus, two pausal forms are surfacing in (4). The first marks the exclamation sentence whereas the second marks the interrogative sentence. Therefore, the characteristic that was emphasised here is that a pausal form occurs in a final position of a sentence.

On the other hand, note that both the contextual forms and the pausal forms are *transcribed* above based on their contextual forms. Hence, the markers that would mark the contextual forms are transcribed even in the pausal forms.

I am following in this the standard practice of Arabic orthography [3] which transcribes all letters and diacritics on words regardless of its position in a sentence. The transcriptions of the pausal forms of the above examples appear within the illustrations next. The point from following the standard practice of orthography is to provide the contextual forms, which are the more common, considering the nature of human speech in general. Hence, it sounded more logic to present them first in particular that they are the assumed underlying form of pausal forms as can be inferred from the illustrations below.

Another needed notification is that the underlined right-edge of a word, which occurs in the pausal-position, is the core part that signifies pausing phenomenon. This is because the realization of a word in a pausal-position would affect its right-edge. As can be seen, the examples above display two phonological processes, (i.e., deletion and lengthening) affecting the segments of the right-edge of a word that is realized in the pausal-position. The pausal form of the word [ʕamiiq-**a-n**] in (1), which is a nunated accusative word, for instance, would manifest the deletion of the nunation marker /-n/ and the lengthening of the accusative case marker /-a/. Thus, the pausal form of [ʕamiiq-**a-n**] is [ʕamiiq-aa]. In (2) the final vowel /-a/ in words like **[(ʔ)al-muʕallim-uuna]** gets deleted but no other process is noticed, hence, the pausal form is **[(ʔ)al-muʕallim-uun]**. In (3) the two morphemes of the nominative case

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[3] This Standard practice is encountered in the Qur'an, children's book and in some scientific textual books. Other books may not transcribe any short vowel whether a lexical vowel or morpho-syntactical vowel.

marker /-u/ and the nunation marker /-n/ are deleted. Thus, instead of the contextual realization of [ʕalij-**u-n**] one finds this typical pausal realization [ʕalij]. In (4) the final open back vowels which appear in the right-edge in [**ʔal-baab-a**] and [**kajfa**] are deleted. Hence, the pausal forms of these two contextual realizations are [**ʔal-baab**] and [**kajf**]. Based on the aforementioned observations, the concluded definition of the pausal-position should specify that it is the right-edge of a pausal-form that forms a phonological environment for a process. Another note is that the process of deletion involves all types of final vowels and not only restricted to case vocalic markers as claimed by some. The second pausal form in example (4) is evidence that sustains this. To clarify, the contextual form of the word **[kajfa]** "how" is paused as **[kajf]**. The deleted final back vowel is lexical not morpho-syntactical.

Other phonological techniques of marking a pausal form in specific dialects of Classical Arabic are documented (see Sibawaih's book, Haaruun's edition: 159-200). On the other hand, the most known rules of pausing are summarized in Galaayiinii (1987, vol. 2: 126-135).Therefore, the characteristic that is deduced here is that the right-edge of pausal forms display different processes.

A final note is that pausing phenomenon affects both types of words the inflective and the non-inflective words in Arabic. The word **[kajfa]** "how" in (4), for instance, in contrast to the other words in the examples is a non-inflective word.

Accordingly, the definition of a pausal-position in Arabic that is proposed in this study is: It is the final position(s) in a stream of an utterance that may be structured of more than one sentence. It cuts this stream of utterance into its main syntactic-semantic unit(s), (i.e., sentences) by marking the words that surface in it. These words are called pausal forms. A pausal form is defined characteristically as a form that exhibits a right-edge phenomenon of a word realization that involves the activation of phonological processes. This phenomenon is of great importance for the investigation of this study. To explain, note that the vocalic markers are in the classical era deleted mainly in sentence-final, hence mainly in the pausal position. The realization of CVCC syllable type was in the classical era also restricted to the pausal position, (i.e., sentence-finally). In another words, it is the deletions of final vowels, which affects the right-edge of pausal forms, what led in the classical era for the CVCC syllable type to surface. This clear relationship made it important to pursue the pausing phenomenon and consider it when conducting the investigation that focuses on the evolution of CVCC in Arabic.

2.3.1.2 Al-ʔidɣaam/Assimilation

In this study, following the Arabicists' research, the Arabic term الإدغام *Al-ʔidɣaam* is translated as "assimilation." There are several types of assimilations that are discussed by early and medieval scholars as one can find in original Arabic sources. In this section, a specific definition for this phenomenon is not given for two reasons. Firstly, because I think the WL translated term would familiarize readers with it. Secondly, because even though this phenomenon is related to the scope of this study but including it within the investigation would broaden it requiring specific expertise in the Qur'anic readings that I am not skilled with. Accordingly, a deep investigation for *Al-ʔidɣaam/Assimilation* in Arabic is suggested here for future research.

However, some types of *Al-ʔidɣaam/Assimilation* are introduced here. As far as Alkhatiib's (2002, vol.11: 41) dictionary, there are classifications for the assimilation processes which are recognized by scholarly Muslims. These include *Al-ʔidɣaam Al-kabiir "the big assimilation"* and *Al-ʔidɣaam Al-sˤsˤaɣiir "the small assimilation."* The big assimilation is most well-known to be a distinctive in the ʔabii ʕamruu Ibn Alʕalaaʔ reading form from the way ʔas-suusii but not from the way ʔad-duurii as far as Anas Alkandari[4]. However, this does not mean that this type of assimilation is exclusive to mainly this Qur'anic reading. Rather, this type of assimilation is also found in other Qur'anic reading forms (see: Alkhatiib, 2002: vol.11: 41). The small assimilation is the wider distributed as it appears a lot in all Qur'anic reading forms.

The difference between the two types is recognized in scholarly Muslims' research within the domains of occurrence. The environment of occurrence CVCV is the domain of big assimilation, whereas the environment of occurrence CCV is the domain of small assimilation. The examples below introduce these two types of assimilations exhibiting some of their patterns. The examples in (5) and (6) are introducing patterns of the big assimilation whereas the examples in (7) are introducing the small assimilation. These data was produced orally by the expert Qur'anic reader Anas Alkandari. This expert reader also answered questions that clarified written materials in Alkhatiib's (2002) Qur'anic readings dictionary

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[4] Dr. Anas Alkandari is awarded with the certificate of القراءات العشر الكبرى " The ten biggest Qur'anic reading forms". The name of these 10 reading forms are: Nafiʕ reading form, Ibn Kaθiir reading form, ʔabii ʕamruu Ibn Alʕalaaʔ reading form, Ibn ʕaamir reading form, ʕaasˤim reading form, Ħamzah reading form, ʔal-Kisaaʔii, ʔabii ʒaʕfar reading form and Xalaf reading form, and Jaʕquub ʔal-Ħadˤramij reading form. Anas Alkandari teaches the Qur'an sciences and the Qur'an exegeses at Kuwait University. He obtained his Master's degree from Kuwait University in 2011 and was awarded with a scholarship to study PhD at the Islamic University in Madinah in Saudi Arabia. He was awarded his PhD degree in 2015. His field of study was the Qur'anic readings in his Master's studies whereas his PhD field of study was the Qur'an exegeses.

and was helpful in understanding the pausing and assimilation phenomena. The transcription is made by me as best as I perceive and know of IPA symbols. The segments of interest are boldfaced. All the examples are articulations for phrases that are part of the holy text of the Qur'an. I offered my own translations for all the examples except (6b) and (6c). The translations for both of these two examples are from Saheeh international (2013: 620, 568).

5a /ja-ʕla**m-u maa**/→ [ja-ʕla**mm**aa]   "he knows that"

5b /fii-**hi   hu**dan/→ [fii**hh**udan]   "in it guidance"

6a /xala**qa ku**ll-a/→ [xala**kk**ull-a]   "HE created all"

6b /wa ʔiðaa ʔal-nufuu**s-u zu**wwiʒat/→ [wa ʔiðaa n-nufuu**zz**uwwiʒat]   'And when the souls are paired'

6c /ħummil-uu ʔal-tawraa**t-a θu**mma/→ [ħummiluu t-tawraa**θθ**umma]   'were entrusted with the Torah then'

6d /ʔalam na-xlu**qu-ku**m/ → [ʔalam na-xlu**kku**m]   "did not WE created you"

Anas Alkandari informed that the examples in (5a) and (5b) are classified as assimilation of متماثلين *Mutamaaθilajn*. This assimilation pattern is known to appear on those consonants that are alike. The other examples in (6) are classified as assimilation of متقاربين و متجانسين *Mutaqaaribajin wa Mutaʒaanisajn*. This means that this assimilation pattern is limited to those close and homogeneous segmental consonants.

The example (6d) shows that the big assimilation may occur within a word, hence, it does not always cross words boundaries. In this example the uvular plosive voiceless /q/ assimilates to the velar plosive voiceless /k/. As far as Anas Alkandari, assimilating /q/ to /k/ is not restricted to the reading of ʔas-suusii **ʕan**[5] ʔabii ʕamruu Ibn Alʕalaaʔ reading form. Rather, it is documented in all Qur'anic reading forms at least في أحد الأوجه "in one of the transmitted ways"[6]. He gave an example of assimilating the alveolar plosive voiceless /t/ to

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[5] This preposition is a technical element that appears in the citation system that was established centuries ago to assure the authenticity of a Qur'anic reading. It technically understood as 'from a way'.

[6] A Qur'anic reading form is transmitted through expert readers. The transmitting of reading forms extends in chains of expert readers through centuries of time. This is a system of citation that is similar to citing materials through personal communication in WL research. However, in contrast to the WL personal communication citation, the system is assessed in the field of Qur'anic studies by scholarly Muslims who have to enjoy of different types of expertise that qualify them for the assessing process. These include the knowledge of the Arabic language, the history, the geography and the Qur'an sciences. The authenticity of a reading form is a judgment given by scholarly Muslims through assessing specific things. An example for these things is the reputation of the expert readers that are in the chain of citation. In addition, that a chain of citation is broken or not broken is another assessed element. By describing a chain of citation to be not broken means each expert reader in this chain had in fact the chance to communicate. For instance, expert reader B who is attributing the Qur'anic reading/articulation to expert reader A had in fact communicated with reader A if the chain was not broken because the assessment resulted on finding the time and possibly the place where the communication took between the two had taken. In the Arabic terminologies the expression not broken is expressed through the word متواترة *Mutawaatirah*. On the other hand, if the assessment resulted on the scholars' inability to locate the time and place of communication or the discovery that the two readers in the chain did not have the chance for

the emphatic alveolar plosive voiceless /tˤ/ attributing it to two Qur'anic reading forms, these are, ʔabii ʕamruu Ibn Alʕalaaʔ's form and Ħamzah's form as another example.

The examples that are provided next in (7) present patterns of the *small assimilation* type, which as mentioned earlier, is wide distributed in the Qur'anic reading forms. That said, just like the big assimilation, not all reading forms have the same patterns of this classified type of assimilation, rather distinctions are observed. Therefore, one concludes that differences are noticed in terms of the distribution of patterns of both types of assimilation; the big and the small in the Qur'anic readings. The underlying representation is compatible to the Uthmaanic outline of the holy text whereas the surfaced representation is compatible to the Qur'anic reading/articulation.

7a /ba**l sa**wwal-at/ → [ba**ss**awwal-at/   "rather enticed"
7b /ba**l tu**ʔθir-uun/ → [ba**tt**uʔθir-uun]   "rather you prefer"

As far as all the data above (5), (6) and (7), specific phonological observations are made. Firstly, in terms of triggering assimilatory change, all the examples of assimilations show that the process is right-to left not left-to-right as a following segment is the trigger for the assimilation not a preceding segment. Hence, the data displays the regressive assimilation type not the progressive. Secondly, in terms of segmental adjacency, in contrast to the small assimilation which displays assimilation of adjacent consonants, the big assimilation displays a vocalic segment intervening between the two consonants that are assimilating. Thirdly, the examples of big and small assimilation types that appear in (6) and (7) manifest a complete assimilation in which the triggered consonants for assimilation, (i.e., the boldfaced left consonants) assimilate completely with those right boldfaced consonant. I perceive them as geminate. Finally, more specified subdomains of application are already recognized by scholarly Muslims. In other words, there are more patterns than the ones that are illustrated above in the Qur'anic readings/articulation forms.

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communication then the reading/articulation would have less authentic position. The chain of citation always begins with one source for the articulation, (i.e., main expert reader) but might exhibit divergence in the second person in the chain. This divergence is observed within *ways*. For instance, the articulations x and X would be cited to one main expert reader but x is from the way α expert reader whereas X is from the way β expert reader. That a main reader produced more than one articulation is known, (e.g., the reader ʔabii ʕamruu Ibn Alʕalaaʔ is known to have two articulations for the holy text, one of them is closer to SA whereas the other exhibit dialectal features of the classical era).

2.3.2   A critical review of Arabicists' conclusions and comments

Some Arabicists' attention has been drawn to the two phenomena of pausing and assimilation connecting them with the loss of the case inflections. In this section, the *italic headings* divide the sayings and comments based on the researcher who introduced them.

Corriente (1971; 1973; 1976)

Corriente (1973: 156-157) considers that:

> Even in texts that must have contained *Iᶜrāb*-Arabic originally, as the Qur'an, inflectional endings are dealt with in a very peculiar manner, being dropped for mere prosodic reasons (vgr. The pausal forms) or even dialectal preferences (like so many instances of *iddigām kabīr*, present already in some canonically received readings of the same Qur'ān; see J. *Cantineau, Cours de phonėtique arabe*. It goes without saying that uncommon lability[sic] of such would-be morphs points to a status of a secondary and redundant set of markers, while the primary burden expression will be supported by a more constant and reliable set of markers (in our contention such "analytical" means as morph-words, word order, etc.). We cannot recall any other instance of a language where true morphs can be deleted so often and for such linguistically unimportant reasons as prosodic and dialectical trends[5].

In footnote 5 Corriente (1973: 157) explains: 'Unimportant synchronically, very important of course in a diachronical or panchronical approach'.

Corriente states several inaccuracies. Firstly, he identifies the pause in the Qur'an as **dropping** *the ʔiʕraab markers*. Since Corriente is noticed mainly testing the case inflections and excluding the mode inflections, 'Iᶜrāb-Arabic' is understood to mean here case-Arabic. The dropping is presumably indicating to the deletion process. However, by this claim, Corriente would be excluding the other processes that are known to affect the right-edge of the pausal form. As seen before, the data that was provided in 2.3.1.1 section, for instance, display two phonological mechanisms, (i.e., the processes of deletion and lengthening). Secondly, he restricts the *dropping to the ʔiʕraab markers*. Thus, based on the tested element in his work, the conclusion was that he is restricting the ALT term to case inflection. However, if Corriente was not in fact intending here to limit the Arabic term to case inflection then he would be claiming that mainly the case and mode inflections are the elements that get deleted. Nonetheless, whether Corriente is referring to both case and mode inflections or mainly case his restriction would still be incorrect. This is because in general the deletion targets final short vowel regardless of its type, (i.e., lexical or morpho-syntactical) and regardless the type of word it is surfacing in (i.e., inflective words or non-inflective words) as seen in section 2.3.1.1 above. Thirdly, he says that pausing is motivated

with 'mere prosodic reasons' which is a falsifiable claim since pausing has syntactic-sematic function in an utterance in the sense that it is informative and structured. It is informative because it specifics a unit in a flow of utterance among other things. It is structured because it is located to the end of a sentence. Fourthly, he says that pausing is a 'very peculiar manner' without giving enough illustrations.

As for the assimilation process, Corriente focuses his observation only on the big assimilation. He says that the 'reasons' behind this process is 'dialectal preferences' and 'dialectical trends'. Even though, the expression 'dialectical trends' can be anticipated in terms of what Corriente (1973) is referring at, the expression 'dialectal preferences' needs from him explanation. In addition, he claims that there are 'so many instances of *iddigām kabīr*'. The '*iddigām kabīr*' is another transcription for the Arabic term that was translated as the big assimilation in this study. Corriente does not specify which Qur'anic reading form in which the 'so many instances' of the big assimilation occur. As far as the Islamic sources, it is known that the many instances of big assimilation distinguish only one way of ʔabii ʕamruu Ibn Alʕalaaʔ reading form. This is the way that exhibits dialectal features, (i.e., the ʔas-suusii way). Lastly, his expression 'the same Qur'an' is unclear because it implies that there is another Qur'an which is not true.

Birkeland (1940 as appeared in Owens 2006)

Employing Sibawaih's descriptive presentation for the realizations of four pausal forms, Birkeland (1940: 21-31, as appeared in Owens, 2006: 22-23) provides an analytical explanation of *how* the decay of the vocalic endings gradually occurred in the form of stages, in which the pausal forms developed. These stages are as follow:

Development of pausal forms in Old Arabic, according to Birkeland

a. Final short vowel, -u,-a,-i, all present, *kaatib-u, kaatib-a, kaatib-i*
b. Development of *rawm*, giving full final –a, and reduced –u,-i. *kaatib-a, kaatib-u/i*
c. Development of *ʔiʃmaam*, leading to –a,-i, with –u represented only by voiceless realization: *kaatib-a, kaatib-i, kaatib-u̥*
d. Development of doubling final consonant (*taḍʕiyf*) as compensation for loss of final vowels: *kaatibb*
e. All final vowels lost = *sukuwn: kaatib*.

(Owens, 2006:22)[7]

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[7] Observe the mistake in transcribing the word سكون sukuun in the quotation above; as Owens transcribes it as 'sukuwn'. The mistake is that the long vowel which commonly transcribed as v: or vv is transcribed as v$_i$v$_j$, which might cause one to assume incorrectly that the vowel is a diphthong.

The assumed stages which Birkeland suggests to reconstruct the development of pausal forms are pursued below because a critic has made different suggestions, (i.e., Owens 2006).

On the other hand, as has been mentioned in chapter 1, the term روم Rawm/'*rawm*' informs that the final vocalic segment, (i.e., /u/, uu/, /i/ or /ii/) is pronounced *when pausing* shorter than their typical length. The term إشمام *Ɂishmaam*/'*Ɂiʃmaam*' informs that the rounding of the lips visually can be seen but the round feature is not perceived by ear. The *Ɂishmaam* commonly occurs in a pausal form; however, it is not restricted on them. These two descriptions for how a vowel may be realized in a pausal form instead of being deleted are of significance for the analysis that is developed in chapter 5 as will be seen.

Owens (2006)

Owens (2006) devotes attention to the two phenomena. I start by evaluating his views regarding the pausing and move on to his views on the assimilation phenomenon. Within the scope of demonstrating his own hypothesis that reconstructs a caseless 'pre-diasporic could turn out to be a proto-Arabic as well', Owens (2006) reverses Birkeland's previous stages. To explain, Owens' (2006: 22-23) criticism for Birkeland's reconstruction is offered below:

> The logical problem involved in this summary is that there is no evidence from old Arabic sources which unequivocally confirms the original maintenance of short final vowels in pausal position. As Birkeland himself notes, pausal pronunciation of short vowels is equally attested in the earliest poetic recitation literature (see Sibawaih II: 325, ch. 507, see discussion in section in sect. 8.1). It is only reconstruction which can sanction one proto-form or another. It is thus equally plausible to assume the pausal forms (*sukuwn*) as original ones, and derive the full-vowel pronunciation as a later development. This is the position argued for here. […].

Clearly, Owens (2006) reverses Birkeland's stages. Thus, the last stage becomes the first stage whereas the first stage is the last. Thus, he argues that the statue in which Arabic nominal words were caseless is the original statue and deriving 'the full-vowel pronunciation' is 'a later development'. However, whereas Birkeland (1940 as appeared in Owens 2006) has more logical stance to be accepted as a plausible scenario, Owens (2006) does not has this stance. This is because it contradicts the reality, the known facts and the practice of Arabic whether the documented or the current. On the other hand, it is not true that there is no evidence that the short vocalic endings maintain in the pausal position. It is well-known that the accusative marker that is attached to an indefinite nominal word, (i.e., marked with the nunation marker) when pausing does not only remain but also lengthens (see the discussion

about example 1 [ʕamiiq-a-n]→[ʕamiiq-aa] in section 2.3.1.1). In fact, Owens (2006: 230) documents this fact in the specified section which he is referring to as 'sect. 8.1'. The following long quotation is extracted from the first page of 'sect. 8.1'. Note that '/y/' in Owens' transcribed data should be read as the glide /j/ because Owens is attributing the data to Classical Arabic. The underlined in the quotation is done by me to point to where Owens declares that the accusative marker remains.

8.1 Pausal and Context Forms and Case Endings

As discussed in sects. 1.6.3 and 3.3.2.3, every Classical Arabic word has two sets of phonological forms, one pausal (waqf), the other non-pausal (waṣl). Traditionally, non-pausal forms are fully inflected, while pausal forms lack short final vowels. These include, but are not limited to, the grammatical case endings on nominals and mode endings on verbs. In (1), the translations are for the non-pausal forms. In the pausal variants the differences indicated by the suffix morpheme are lost.

(1) Non-pausal   pausal
    bayt-un   *bayt* 'house-NOM'
    al-bayt-u   *al-bayt* 'the house-NOM'
    bayt-in   *bayt* 'house-GEN'
    al-bayt-i   *al-bayt* 'the house-GEN'
    al-bayt-i   *al-bayt* 'the house-ACC'
    yaktub-u   *yaktub* 'he writes-IND'
    ʔayna   *ʔayn* 'where?'
    Etc.
An exception is the indefinite accusative case, which in pausal form has a long-aa, *bayt-aa* 'a house'

(Owens, 2006: 230)

The lengthening of the accusative of a paused nunated indefinite accusative words still occurs in both SA and MSA. However, in the classical era, there were Arabs who would not delete the vocalic markers at all. Instead, they would *lengthen* them as a way of marking the pausal forms. Sibawaih in his book citing a man called Abuu Alkhatˤtˤaab specifies that in contrast to the majority of Arabs, the tribe أزد السراة Azd Alssuraat lengthens the case marker in all indefinite nominal words, whether nominative, genitive or accusative, as a strategy to mark pausing (see Haaruun's edition, vol. 4, p. 167). Accordingly, Owens' position is in contrast to what he says is not as 'equally plausible' and as far as the long quotation above he knows this.

On the other hand, Owens (2006: 85) declares:

> 'In the Classical Arabic the neutralization, at least in traditional accounts (see sects. 1.6.3, 3.3.2.3) occurs in pausal position. Besides raising questions of functional centrality of case in Semitic (see sects. 3.3.1), the presence of these caseless contexts suggests that even those Semitic languages with morphological case systems possessed traces of the caseless variety.'

Ambiguity is surrounding Owens' words here regarding those 'traditional accounts' which specify that the pausal position is where the 'neutralization' occurs in the Classical Arabic. Upon checking the sections which he refers to, it turns out that the word 'neutralization' does not appear and is not part of the discussed issues in these two sections of his book. However, while reading his book, I found in (Owens, 2006: 60-61) the following words:

> The weakly articulated contrast between [i] and [u] is further in evidence in the case endings-u 'nominative', -i 'genitive'. I will deal with case vowels extensively elsewhere in Chs. 3 and 4, using both the grammatical and the Koranic traditions as the basis of my argumentation. What is relevant for present purposes is that Sibawaih recognized a realization of nominative-u and genitive-i before an object suffix, i.e. not in pausal position, in which the vowel contrast was neutralized. This is termed *ixtilaas*, and is characterized by a very rapid, indistinguishable vocalic quality (*yusriʕuwn al-lafẓ*).
> […].
> It is noteworthy that Sibawaih goes out of his way to indicate that a short vowel is still audible before the suffix (see further sect. 2.4.2 and n 38).
> This treatment of the nominative and genitive endings is also attested in the Koranic reading tradition, and in fact is associated with the tradition of the Basran, Abu ʕAmr ibn ʕAlaaʔ (= Abu Amr, […]) where it is given the general designation of *taxfiyf* 'making light'. Notably, Sibawaih also cites Abu Amr on this point (II: 324.18).

These words are supposed to present counter evidence that refutes the first part of Fischer and Jastrow's 1980 'proposal'. Their proposal according to Owens (2006: 52) 'Short vowels are stable and/or contrastive in Old Arabic, while in Neo-Arabic they have changed in such a way that their stability and contrastive value is reduced.' Fischer and Jastrow 1980, according to Owens (2006) in this proposal were referring to all types of vowels the lexical and the morpho-syntactical. However, Owens (2006) counters them by claiming that in addition to the pausal position there is another position in Arabic in which the short vowels are 'neutralized'. As far as the words which he is using, I conclude that he employs the word neutralization to mean *the loss of contrast between vowels*.

Furthermore, Owens (2006: 60) transcribes two of Sibawaih's data which introduce the *ixtilaas* process and affirms that it occurs in the Qur'anic reading form that is attributed to 'Abu ʕAmr ibn ʕAlaaʔ (= Abu Amr'. He also informs that Sibawaih 'recognized' the *ixtilaas* process mainly in nominative and genitive vocalic cases. In addition, he alerts that 'Sibawaih goes out of his way to indicate that a short vowel is still audible before the suffix'. There is a need to clarify, correct and modify what Owens is informing.

Firstly, *ixtilaas* is a term with a specific meaning. In the pages that Owens is referring at (i.e., '(II: 324.18)', Sibawaih introduces the process by giving specific information about it and data. The expression 'يسرعون اللفظ', which Owens transcribes as '(*yusriʕuwn al-lafẓ*)', for instance means that "they articulate [the specified vowels] in rapid speech". Thus, it is not the vowels that are 'characterized by a very rapid'; rather it is the type of speech in which these vowels surface on that is characterized by being rapid. As for the information that appears in Owens' clause 'indistinguishable vocalic quality' it is incorrect. The qualities of the vowels are distinguishable through the terminologies which Sibawaih uses. These terms are 'الجر' ʔal-ʒar and 'الرفع' ʔ ar-rafʕ which specify the articulation of the nominative and genitive cases; hence, the articulation of the round vowels and the front vowels. In addition, the qualities of the vocalic segments in Haaruun's edition of Sibawaih's book are transcribed on some of the data. However, the edition which Owens is using of Sibawaih's book is Derenbourg's edition not Haaruun's. Since I did not test this Derenbourg's edition I do not know whether the vocalic segments are transcribed or not. Yet, even if they were not transcribed, as said the terms appear in Sibawaih's text and Owens did recognize them as clearly can be seen from his text as he openly specifies the nominative /u/ and the genitive /i/.

Secondly, the claim that Sibawaih 'recognized' the *ixtilaas* process to be limited to mainly nominative and genitive vocalic cases is in need for a proof. This is because even though, stylistically, Sibawaih names a linguistic topic in a chapter but he does not always provide all the related information nor he limits the chapter with the named linguistic topic. Rather, in his big book, my edition consists of 5 volumes whereas Owens' edition consists of 2 volumes, ones find themselves are encountering related pieces of information in different chapters. Sibawaih does not refer readers to the other positions in which these related pieces of information appear on. Thus, it is a hard task to find out what Sibawaih is saying about a linguistic topic as one needs to assess his book carefully. The consultation of a more recent source that informs what the early grammarians says including Sibawaih about the *ixtilaas* process, showed that this process is not limited to the genitive and nominative vowels rather it processes in all case vowels (see: Alkhatiib, 2002, vol. 11, 45-46). This recent source

informs as well that the articulation of the case vowels is two-thirds its typical length. It also informs that there are early and medieval grammarians who said it is producing most of the vowel and others said "it is articulating the vowel in rapid".

Thirdly, Owens does not inform that among what Sibawaih says in the specified pages that the vowel when surfacing in a rapid speech has the characteristic: 'و زنةُ الحركة ثابتة، كما تَثْبت في الهمزة حيث صارت بيْن بَيْن'. The Arabic words mean "and the weight of the [surfaced] vowel is constant, and the weight appears, as well, constant in the glottal stop which became intermediate". That the weight of the surfaced vowel is constant indicates that its quantity is steady. On the other hand, Sibawaih in the second sentence introduces new information about the intermediate glottal stop that was not mentioned in the chapter of the glottal stop in his book. Based on what has been established about this segment in chapter one in this study, Sibawaih's new information informs that the glottalization of vowels does not affect mainly the lexical vowels but also the morpho-syntactical vowels.

Fourthly, that the *ixtilaas* process occurs in the Qur'anic reading form that is attributed to 'Abu ʕAmr ibn ʕAlaaʔ (= Abu Amr' is correct. That Sibawaih refers to this form of Qur'anic reading extracting an example from for the *ixtilaas* is also correct. However, the *ixtilaas* as introduced here, not as introduced by Owens, is what appears in the specified Qur'anic reading form, and is what Sibawaih says. Hence, in this particular Qur'anic reading form the case vowels are mainly shorter than their typical length.

Fifthly, that 'Sibawaih goes out of his way to indicate that a short vowel is still audible before the suffix' is not true. The only information that Sibawaih informs about the audibility of the surfaced vowel is that it is constant in terms of the duration of its articulation. He does not say whether it is short or long nor does he argue that they are audible or not. Thus, I do think that they were perceived vowels. When a vowel is not audible other terminologies are used. For instance, as said before, the term إشمام *ʔishmaam* is used to inform a round vowel is not audible even though visually the rounding of the lips of a speaker can be seen.

Finally, Owens (2006: 99) states that 'Dealing as we are with written texts there is no way to measure where precisely pauses were placed in the Classical language'. This claim is false. There is a way to do the measuring if one studies the Qur'anic readings as the places of pausing are documented in details. In fact, scholarly Muslims recognize the pausal positions in the holy text of the Qur'an within classification terminologies. Some of these can be translated to prohibited pausal positions, tolerable pausal positions and positions were pausing is necessitated. Moreover, recordings of the different Qur'anic reading forms produced by current expert readers are attainable and accessible. Thus, even those

phonologists, who are not able to read Arabic texts of scholarly Muslims, can listen to the recordings themselves and detect the pausing positions. Pausal positions can be detected by a human ear, though a phonetician may prefer to use modern technology.

Moving to Owens' comments on the assimilation phenomenon, the way Owens (2006) introduces the process الإدغام الكبير *Al-idgaam Al-kabiir* to his readers in order to demonstrate his own hypothesis of a 'caseless proto-Arabic' makes his 2005 research unreliable because it lacks honesty and accuracy among other things. For instance, Owens was found alluding upon the big assimilation in the reading of ʔabii ʕamruu Ibn Alʕalaaʔ[8] as following:

> This is why the term *al-ʔidɣaam al-kabiyr* 'major assimilation' eventually (see n. 5) became associated with it (rather than, say *ʔilɣaaʔ al-ʔiʕraab*). Recalling that by tradition the reading practices are prior to the grammatical, the lack of stigmatization of the Abu Amr tradition – a stigmatization might have been expected given its caseless character – is due to its establishment before what may be termed the 'ideology of *ʔiʕraab*' became established in the Islamic tradition. In the early history of Islam, *ʔiʕraab* simply did not have the normative force which the grammarians later established for it (see Larcher 2006*a*; Larcher and Guillot 2005*b*)

(Owens, 2006: 122)

Several points are noted here. The first point is related to Owens' substitution for the original Arabic term with another proposed term that he does not translate to English. The original Arabic term fairly refers to mainly an assimilation process, whereas Owens' Arabic proposed term, (i.e., '*ʔilɣaaʔ al-ʔiʕraab*'), literary means "the cancelation for the case and mode". Hence, the term implies that there is a cancelation not only for the case inflections but also the mode inflections. Such implication does not have any stance and contradict the reality. Therefore, Owens (2006: 122) is not only injecting a 'caseless character' to the documented 'tradition' of this reading through this manipulation of words but also injecting a modeless character to it. Nonetheless, the injected characters are falsifiable through the documented materials, the current practice and the testimonies of expert readers of this reading in all its traditions, (i.e., different transmitted ways as a way can be understood as a school of Qur'anic tradition). As for his referral to '(see n. 5)' the abbreviation 'n.' is not among his list of abbreviations. Another point, Owens' expression 'lack of stigmatization' and 'ideology of *ʔiʕraab*' are thought ambiguous because the words that are supposed to explain them are so brief.

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[8] In Owens' quotation, it appears transcribed as 'Abu Amr tradition' but in his book Owens refers to him as well through: 'Abu ʕAmr ibn ʕAlaaʔ (= Abu Amr'.

On the other hand, critical mistakes and errors are noticed in Owens book. For instance, it was noted that he made specific mistakes relating to the holy text of the Qur'an. The first observed mistake is regarding a specific holy phrase that appears in the Qur'an. This phrase is *ʔaala luutˤin* "relatives, follower and helpers of Luutˤ" which Owens uses as a data (see: Owens, 2006: 126). Owens (2006) specifies four occurrences for the phrase in the Qur'an, but not all the Chapters and verses which he is referring to are correct. Nonetheless, the exact appearances of this phrase in the holy text of the Qur'an are: *twice* in Chapter (15) ʔal-Ħiʒr, *once* in Chapter (27) ʔan-Naml, and *once* in Chapter (54) ʔal-Qamar.

The second observed mistake appears in Owens' (2006) statements:

'Morpho-phonologically assimilation is said not to apply[11] to the agentive pronoun *–tu*, as in *xalaqtu ṭiynan* 'I created from mud',[12]'

In the footnote 11, Owens states: 'The terminological opposite of *ʔidɣaam* is *ʔiðhaar*, where the 'original' consonants appear.'.

In footnote 12, Owens states: 'Though even here, some readers assimilate the *–ta* (i.e. use *–t* alone) in one fragment (57).'.

(Owens, 2006: 127)

In the first instance one may not realize that Owens' example '*xalaqtu ṭiynan*' is supposed to be sourced to the Qur'an because of his style of referencing it. In contrast to the customaries in referencing, Owens does not name the Qur'an as a source nor does he provide reference for the translation in the text. However, when one examines the whole context in the specified page, it is evident that Owens is attributing the verbal phrase '*xalaqtu ṭiynan*' to be part of the holy text of the Qur'an. There are several clues that make ones figure this. Firstly, in the text, the phrasal expression as can be deduced from the translation has a known Abrahamic belief (i.e., creating [something] from mud). It indicates to the creation of Adam from mud which the believers of the three Abrahamic religions, (i.e., Judaism, Christianity and Islam) believe of. The terms '*ʔidɣaam*' and '*ʔiðhaar*' in footnote 11 are among the terminologies that are used by scholarly Muslims to describe the reading/articulation of the holy text of the Qur'an. Finally, the phrase 'readers assimilate' in footnote 12 confirms that Owens is referring to Qur'anic readers as he uses the word 'readers' in his book technically as an equivalent translation for the Arabic term قراء *qurraaʔ*. However, utilizing the Qur'an corpus search engine that is, http://corpus.quran.com, I found out that Owens' verbal phrase is not part of the Qur'an. To explain, the noun '*ṭiynan*' is marked with the accusative and the nunation inflections /-a-n/ in Owens' italicised verbal phrase. The search engine showed that

this noun is marked in accusative mainly in verse (61) in Chapter (17) ʔal-ʔisraaʔ which is offered below with three translations. The phrase of concern is underlined in the Arabic transcript and translations. THE GOD ﷻ says:

﴿ وَإِذْ قُلْنا لِلْمَلائِكَةِ اسْجُدوا لِآدَمَ فَسَجَدوا إِلّا إِبْلِيسَ قالَ أَأَسجُدُ لِمَن خَلَقتَ طِينًا ﴿٦١﴾﴾

This is the suggested translation for the whole verse by Pickthall (2006: 303): '61.And when We said unto the angels: Fall down prostrate before Adam and they fell prostrate all save Iblis, he said: Shall I fall prostrate before that which Thou hast <u>created of clay</u>?'

By 'Alī (2001: 691): '61.Behold! We said to the angels: Bow down unto Adam: They bowed down except Iblis: He said: Shall I bow down To one whom Thou didst <u>create From clay</u>?'

By Saheeh international (2013: 270): '61. And [mention] when We said to the angels, Prostrate to Adam, and they prostrated, except for Iblees. He said, Should I prostrate to one You <u>created from clay</u>?'

Clearly, from the three translations there is No 'I created' which appears in the translation that is provided by Owens, rather it is "You created" or "Thou." Nonetheless, the correct transcription for this phrase to match what is in the holy Arabic text of the Qur'an is [xalaq-**ta** tˤiin-a-n]. In other words, the vocalic that is surfacing in the verb is /u/ not /a/. Hence, Owens' mistake is that in the phrase, the realized pronominal suffix is 2Pers.Sing /-ta/ not the pronominal suffix 1Pers.Sing /–tu/.

2.3.3 Overall

Notably, Corriente (1971; 1973; 1976) declares there is an 'offset' that happens for الإعراب ʔiʕraab system as a result of the phenomena of pausing and big assimilation. Owens (2006) declares that the pausal position is the 'neutralization' position in Classical Arabic. In addition, he redefines the characteristics of the ʔabii ʕamruu Ibn Alʕalaaʔ reading form, by substituting the essence of the big assimilation process in this reading to a process of 'ʔilɣaaʔ al-ʔiʕraab', (i.e., a cancelation process for the whole system of الإعراب the ʔiʕraab in its both inflections case and mode). Note that whilst Corriente (1971; 1973; 1976) is observing the two phenomena as peculiarities that cause postponing of the ʔiʕraab system in specific positions, Owens (2006) is claiming that it is not mainly a postponing for الإعرابthe ʔiʕraab system rather it is a cancelation.

In relation to the big assimilation, it is important to form a statistic of its occurrence comparatively and on average to reveal on its apparent role in the change that led to lose the vocalic endings in the Arabic language. This is a suggestion for future research.

On the other hand, pursuing the issue of the claimed 'neutralization' in pausal position, I have consulted Silverman's (2012) introductory textbook for the *neutralization* phenomenon. Other related phenomena are also introduced in this book. These are *partial phonemic overlap*, *Near-neutralization* and *Near-merger*. The following definitions of these phenomena are extracted from the glossary of Silverman (2012: 202, the boldfaced is in the original):

Near-merger: A diachronic phenomenon whereby two (or more) values come perilously close to each other without genuinely neutralizing, thus potentially allowing the values to engage in subsequent robust split.

Near-neutralization (also **incomplete neutralization**): A synchronic phenomenon whereby two (or more) contrastive values possess alternants in the same context(s) that come(s) perilously close to each other without genuinely neutralizing.

Neutralization: a conditioned limitation on the distribution of a system's contrastive values.

Partial phonemic overlap: According to Bloch (1940), two contrastive values **a** and **b** may be in a relationship of partial phonemic overlap if one or both process(es) a conditioned alternant that eliminates the phonetic distinction between a and b, though a and b may still be phonologically differentiated by virtue of their distinct context.

The observed similarities yet still distinction between the definitions of the aforementioned phenomena require a detailed investigation in future research to determine which one of them is the observed phenomenon in the Classical Arabic language. Interestingly, as far as the illustrations presented by Silverman (2012), these phenomena include assimilation.

2.4 Conclusion

The conclusion that is drawn from the discussion above is that, the case system in Arabic consists of phonetic values that are not restricted to the short vocalic segments. Rather, as seen in section 2.2, there are phonetic values that contain consonantal segments, (e.g., /-aan/ and /-ajn/ in the dual forms) Moreover, the phonemic long vowels also mark case in six words and are part of the lexical component of the case morphemes that mark the

nominative dual forms, (i.e., /aan/) and the masculine sound plural forms, (i.e., /uun/ and /iin/). The reasoning that is made from these observations is that a reduction for the phonetic values of case morphemes had occurred. As a consequence, the case morphemes reduced to mainly short vowels in some point of time. However, these short vowels later were themselves are lost. Two phenomena evidently have contributed to this loss. These are the pausing and the assimilation. The role of these two phenomena, which we can see from the Qur'anic readings, the early Arabic sources and the standardized Arabic, display that they were mainly a postponing for الإعراب the *ʔiʕraab*, (i.e., the case and mode inflections). The subsequent chapter introduces the hypothesis of this study and the rationales behind it.

Chapter 3
Suggesting *morpho-phonological perspective* to approach the loss
Phonology; Do Something!

3.1 Introduction

This chapter introduces the hypothesis of this study with the justifications that rationalize it. The hypothesis postulates that the loss of the vocalic endings, which functionally prevent syllabic complexity from surfacing, has been compensated by *phonology*. Evidence in support of this claim is discussed with more details in this chapter. This evidence is an epenthesis process already witnessed in several modern Arabic varieties (see for example the modern Arabic dialects typology in Kiparsky 2003 and Watson 2007). The unique aspect about this epenthesis is that it prevents CVCC superheavy syllable from surfacing which means that, functionally, the epenthetic vowels have the phonological function of the lost vocalic endings.

Accordingly, the structure of this chapter is as follows. In the next section, the details of the hypothesis are presented. In the third section, the rationale behind the hypothesis is demonstrated through a discussion. From the discussion, three points are to be established. The epenthetic vowels show parallel with the lost case markers in the (i) *phonological function* (ii) *locus* and (iii) *phonetic values*. The fourth section presents a critical review of phonologists' research and historical Arabicists' research. The fifth section of this chapter is concerned with illustrating how this hypothesis was designed to be tested within this study. However, before explain the designed test a survey for the phonological literature has been conducted to come out with a primitive typology of final-codas of monosyllabic stems in the modern Arabic dialects. This typology shows that the patterns of codas, which are found in the modern Arabic dialects, are of interest and need to be investigated in relation to their historical development. This section also includes explaining the designed method for investigation, the selected data and its sources, the selected modern Arabic dialects and the justification behind approaching the data with the framework of Optimality Theory. I conclude with summarizing the main issues that were alluded upon in this chapter.

3.2 A new postulated hypothesis

As said before, the basic assumption of the hypothesis is that *the evolution of CVCC syllable type in Arabic is due to the loss of* إعراب *ʔiʕraab*. In a different phrasing, *the evolution of the superheavy CVCC in Arabic is due to the loss of the mode and case vocalic inflections*. However, testing this hypothesis in this study involves mainly investigating the

effects of the lost case inflections on nouns. Therefore, the tested part of the hypothesis narrows the broadness of the basic assumption of the hypothesis which essentially establishes two theses each involves a different inflectional category and a different words type.

Accordingly, this study intends to explore morpho-phonological changes that affected the phonological structure of nominal words in the Arabic language due to the loss of a morpho-syntactical morpheme, (i.e., the vocalic *case* markers in particular the short ones). The tested thesis postulates that as *a consequence of the loss of the vocalic case endings in the Arabic language, phonology employs epenthesis to prevent syllabic complexity from surfacing, (i.e., to prevent the innovation of CVCC)*. The focus of the investigation will be on the realization of final-clusters of nominal CVCC underling stems. It is observed that the final-consonant sequence -*CC* of such stems in the modern era is broken up by vowel epenthesis. Contrary, it is a case suffix that breaks up the final-consonant sequence in such stems in the classical era. In other words, I argue that phonology reacted by utilizing epenthetic vowels to overcome the complexity which the language became threaten to have on the surface due to the loss of the vocalic endings. However, it is not mainly the issue of preventing complexity in codas that made phonology reacts with supplying the structures with the epenthesis repair strategy. Rather, the reaction is argued to be motivated with preventing the increase in Arabic syllable inventory which unconditionally allows mainly CV, CVV and CVC.

The focus of the test is on specific type of nominal words that has the most potential to surface complexity in codas, (i.e., CVCC underling stems). The selection of this type of stems, therefore, is because of the amount of potentiality that it has to surface the syllable CVCC. The privilege of this selection is that it enables a straightforward test for the assumption that CVCC is an evolution from the loss.

The exploration of the thesis is intended to be in depth. Thus, since surveying the literature, (e.g., Kiparsky 2003 and Watson 2007) in relation to the epenthesis process in the modern Arabic dialects has revealed that this process is exhibited in some modern Arabic dialects only when the monosyllabic stem is inflected, (e.g., Egyptian Arabic), whilst other dialects, (e.g., Iraqi Arabic) manifest the epenthesis in both the monosyllabic stem-form and its inflected-forms, I investigate both forms. Therefore, the realizations of the stem-form of the monosyllabic word and its paradigm, where the monosyllabic nominal is attached to pronominal suffixes, are part of the investigation.

That the investigation involves stem-forms and inflected-forms relates the concerns of this study to both the phonological and morphological aspects of change. As for the

monosyllabic stems, which are targeted in this study, these are singular forms that have the underlying sequence CVCC. Thus, they hold the risk of surfacing the CVCC syllable unless the short vocalic case morpheme is being affixed to them, hence, CVCC-V.

Based on what were found in the consulted literature, it was assumed that the intended investigation within this study will reveal that the change, (i.e., the loss of vocalic case suffix) has reshaped the grammar of the Arabic language. The role of *universal markedness constraints* was thought important in the final reshaped grammar. I assumed that the modern Arabic dialects exhibit differences in terms of the types of codas that are allowed to surface. These differences can be expressed within the framework which this study is adopting to account for the data, that is, Optimality Theory (OT henceforth).

3.3 The rationale behind the hypothesis

The discussion in this section is focused on justifying the tested part of the hypothesis. I argue that there are several observations that provide compelling reasons for the implementation of this study. My focus here is on two of these observations. Firstly, the vocalic case markers have a phonological function, in that they prevent the final consonant clusters from surfacing as complex codas. Secondly, there is a vowel epenthesis process that has the same phonological function, phonetic values and locus in the modern Arabic dialects. This epenthesis process is documented in some phonologists research, (e.g., Kager, 1999; Kiparsky, 2003; Farwaneh, 2009) and some linguistic Arabicists' research, (e.g., Owens 1998a; 1998b; 2006).

3.3.1   The phonological function of the case markers in Arabic

It is evident that case endings in Classical Arabic, SA and MSA, in particular the short ones, are structurally functional. They contribute towards the formation of a phonological structure that does not consist of complexity in codas whether when attached to simplex bases or complex bases. This section aims to practically demonstrate this phonological function. On the other hand, possessing this phonological function makes it reasonable to question whether there are phonological consequences resulted from the loss of these multi-functional vocalic markers. As can be seen in the following data, only singular nominal stems are selected, as they are the tested nouns in the investigation of this study.

A. Stems inflected with case markers

Noun	*Case*	*Nominative*	*Accusative*	*Genitive*	Meaning
1. /kalb/→		a. [ka**l.b**-u]	b. [ka**l.b**-a]	c. [ka**l.b**-i]	Dog
2. /ʕilm/→		a. [ʕi**l.m**-u]	b. [ʕi**l.m**-a]	c. [ʕi**l.mi**]	knowledge
3. /ħusn/→		a. [ħu**s.n**-u]	b. [ħu**s.n**-a]	c. [ħu**s.n**-i]	Beauty
4. /fa.raħ/→		a. [fa.ra.ħ-u]	b. [fa.ra.ħ-a]	c. [fa.ra.ħ-i]	Happiness

B. Stems inflected with case markers and possessor inflections

5a. /kalb+u+hum/ → [ka**l.b**u.**h**um]   'their dog-Nom.'
5b. /fa.raħ+u+hum/ → [fa.ra.**ħ**u. **h**um]   'her happiness-Nom'

The examples (1), (2) and (3), clearly, show that when stems are underlyingly monosyllabic with a CVCC sequence, the absence of vocalic case markers would result in deriving a complex cluster in final-codas. This is confirmed even in the classical era and certainly in SA and MSA, with what is known as the pausing forms. Accordingly, the *standard* pausing forms of the monosyllabic stems in the previous example are realized on the surface level with complex codas as following: [ka**lb**], [ʕi**lm**] and [ħu**sn**]. These types of monosyllabic words are what interest this study.

On the other hand, although the example /fa.raħ/ [9] does not have a consonant cluster underlyingly, the possibility for complexity in codas to surface still exist when the base is inflected with pronominal suffixes as shown in (5b). However, this complexity is avoided with the occurrence of a case marker on the surface. As shown the nominative marker (*italic*) in (5b) breaks the underlying consonant sequence (**boldfaced**). In doing so, the nominative marker syllabifies the last consonant of the stem as an onset when surfacing as a contextual form. This shows that neither complex codas nor complex onsets are favoured in Classical Arabic, SA and MSA. Yet, surfacing complex codas does not hold the same disfavour as complex onsets. This is because complex codas, even though are marked, but their markedness is conditioned since they are allowed to surface in a pausal position. This was mentioned before in chapter two but in different terminologies that emphasised that the superheavy syllable CVCC is restricted to pausal position. The focus on the types of coda in

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[9] This study will not consider such data. The example which is given here is mainly provided to explain the phonological function of case markers to prevent complexity from surfacing in a bisyllabic root.

this stage is because of the need to recognize their typology considering that the case inflections are final segments that prevent complex codas.

Therefore, with the loss of those markers that fulfil this phonological function, a change is expected in terms of the realizations of syllabicity in modern Arabic dialects. This change involves the occurrence of complexity in codas, especially in nominal words that consist of CVCC as roots. In addition, it is expected to find more consonant adjacency word-middle in the realization of bisyllabic and polysyllabic words.

3.3.2   Parallels between the epenthetic vowels and the vocalic case markers

I illustrate, practically, here how the epenthetic vowels parallel the vocalic case markers in terms of the position and the phonological function. Examples in (6) demonstrate these claimed parallels.

6a. /kalb +u+ha/ → [kalb-u-ha]   "her dog Nom" in both Classical Arabic and MSA
6b. /kalb +ha/ → [tʃal*i*b-ha]   "her dog" in Iraqi Arabic
6c. /kalb +ha] → [kalb*a*-ha]   "her dog" in Egyptian Arabic

As highlighted, the epenthetic vowel that is found in Egyptian Cairene Arabic, (i.e., 6c) clearly mirrors the case marker. On the other hand, one may argue that the epenthetic vowel in (6b) unlike (6c) differs with respect to the locus. However, it does prevent the realization of a complex coda on the surface by syllabifying the second consonant of the –CC as onset. Hence, even though it differs in the locus but it has the same phonological function of the lost case markers.

Another parallel that is of interest is related to the value of the epenthetic vowels. In that, Owens (2006) declares:

> The epenthetic vowel is usually a high vowel whose precise value, front, back or mid, is determined by consonant context. In a few dialects, including WAS and Cairene, the value of the epenthetic vowel is determined by the nature of the following consonant formed by the pronominal suffix. There are three epenthetic vowel values, [i,u,a].
>
> (Owens, 2006:108)

I take this as another piece of evidence for the argued relationship between the epenthetic vowels and the lost case markers since it demonstrates that there is an acknowledgment that the epenthetic vowels and the markers exhibit the same phonetic values.

As a consequence for these observed parallels in the function, quality and locus between the lost case markers and the modern epenthetic vowels, a study is required to

determine whether there is a historical relationship between the two. The speculation is that the epenthetic vowels stem from the loss of vocalic endings, or in other words *compensate* them phonologically.

3.4. A critical review

This section reviews the works of some phonologists and linguistic Arabicists in terms of their contributions towards discovering the connection between the modern epenthetic vowels and the vocalic case markers. The review demonstrates two issues. Firstly, that the relationship between the case markers and the epenthetic vowels was not considered adequately by phonologists. The second is that in contrast to the phonologists, the historical linguists of the Arabicists have observed the similarity but did not pursue a deep phonological and morphological investigation.

3.4.1   The phonologists' contributions

The first subsection summarizes how the phonologists have contributed in terms of the investigation of the loss of the case markers in the Arabic language and the emerged epenthetic vowels. The discussion demonstrates that the phonologists have not approached the loss of the case markers from a morpho-phonological perspective and that their attention was focused on the modern epenthetic vowels. On the other hand, three phonological works are evaluated in separate subsections because these works discuss issues that are of this study's concerns. These works are Hamid (1984), Shaaban (1977) and McCarthy (2011).

3.4.1.1 General view

The general view which was deduced from the literature of phonology is that in contrast to the case system, the vowel epenthesis process within modern Arabic dialects has received a considerable amount of research and consideration, (e.g., Itô, 1989; Kenstowicz, 1986; Broselow, 1980; 1992; 1993; Mester & Padgett, 1994; Zawaydeh, 2003; Kager, 1999; Kiparsky, 2003; Farwaneh, 2009; Watson, 2007; Elfner, 2009; Gouskova & Hall, 2009; Ibrahim 2012).

However, the aims and perspectives of these researchers are not of the same nature. For instance, Gouskova & Hall (2009) investigated the acoustic characteristics of the epenthetic vowel in Lebanese Arabic. Broselow (1993) was concerned with the exhibited insertion process from an acquisition perspective. The theoretical phonologists, on the other hand, were concerned in suggesting theoretical accounts for the process, (e.g., Itô 1989;

Broselow 1980 & 1992) within a pre-OT framework, whereas Elfner, 2009; Watson, 2007; Kiparsky, 2003; Mester & Padgett 1994; Zawaydeh, 2003; and Kager 1999) within OT.

Furthermore, in the theorists' proposed analyses, the process was not always the main target itself; instead, it is found that there are researchers, (e.g., Kager 1999) whose concern was on finding a solution for the *metrical opacity* which results from the stress-epenthesis interaction in Levantine Arabic. In his analysis of Levantine Arabic, Kager with his output/output constraints was introducing a solution for classical OT which is inherently unable to capture opacities. Piggott (1995) approaches the epenthesis in Iraqi Arabic theoretically to demonstrate that a syllable does not have always to be associated with a mora.

On the contrary, phonologists such as Broselow (1992), Zawaydeh, (2003) Watson (2007) Farwaneh (2009) were proposing a theoretical analysis that accounts for the syllabic typology of Arabic vernaculars. Even though Kiparsky (2003) was aiming an account for the syllabic typology but he also was aiming to refute Kager's (1999) proposed solution for the metrical opacity.

In some detail, it is found that Kiparsky (2003) proposes a semisyllable account in which a stratified constraints system overcomes the problem of opacities and accounts for other phenomena and processes that are found in the syllabification patterns of modern Arabic dialects. Watson (2007) agrees on the superiority of Kiparsky's stratal version of OT and suggests mora-sharing as a device that captures specific complexity related to long segments which appear when expanding a wider set of Arabic data. As for Zawaydeh (2003), she tests the capability of syllable alignment constraints, which were proposed by Mester & Padgett (1994) and Wilshire 1994 within OT, in accounting for data from other Arabic varieties, (e.g., Muscat, Cairene and Sudanese). Farwaneh's (2009, 82, 83), paper is a research that presents another attempt to account for the typology of Arabic dialects. Her focus is on 'the role of final consonantity'. She also examines 'the implicational power of the epenthesis site typology'. According to Farwaneh 'final consonantity' is 'the salient on Arabic stems […] which stipulates that the right edge of a stem must be marked by a consonant' (2009: 82).

Broselow (1992: 8), which preceded the previous works, argues that the variation noted in several Arabic dialects in terms of syllabification patterns can be captured by imposing different constraints on 'possible syllables and possible moras'. These constraints do not operate in the same levels of grammar, rather differences are noted in terms of word level and phrase level. Worth alerting, she recognizes the levels within derivational framework. The epenthesis was not the only focus of Broselow's (1992) as she also

approaches deletion and shortening of vowels. On the other hand, considering Broselow (1980), which is centred on inserting epenthesis and the treatment of geminate in mainly Iraqi Arabic and Egyptian Arabic, it is obvious that Broselow (1992) extends her focus to more Arabic dialects and other phonological processes.

There are also specific theoretical works that aim to capture the epenthesis process in a specific Arabic dialect such as Abu Salim (1980) who analyses the epenthesis in Palestinian Arabic and Haddad (1984) who analyses it in Lebanese Arabic.

In an overall view, it was noticed that, even though MSA still preserves the same case system of its ancestor, no association between the epenthetic vowels of the modern era and the vocalic markers was considered theoretically by phonologists. From some perspective, one does expect that the typology of syllabification patterns of modern Arabic dialects which Kiparsky's (2003) suggested, and was extended later on by Watson (2007) would include the syllabification pattern of MSA. Such expectation is rationalized with the *amount* of modern Arabic dialects that are selected to be part of the typology which they are forming. In addition, MSA is a very well-known Arabic modern variety[10] that one should not ignore when forming such a typology which generalizes the syllabification patterns of the modern Arabic dialects. Finally, the noticed resemblance between the vocalic case inflections and the core of these works, (i.e., the epenthetic vowels) is another good reason to include MSA in the suggested typology.

Nonetheless, I found some researches that show what is considered a form of acknowledgements in terms of the relationship between the vocalic markers and the epenthesis process. These works are Hamid's (1984) and Shaaban's (1977). The scope of their research, however, was on presenting a descriptive analysis of the phonology of a modern Arabic colloquial. Thus, the epenthesis and the case markers were not core in their works. Hamid (1984) is giving a descriptive analysis of the phonology of Sudanese Arabic, (i.e., the dialect of the middle part of Sudan) whereas Shaaban (1977) is giving a descriptive analysis of the phonology of Omani Arabic, (i.e., Muscat dialect). These two works are given some attention in separate subsections to discuss the form of acknowledgment that each presents.

Another work that is reviewed in a separate subsection is McCarthy (2011). This paper focuses on the alternations between pausal forms and non-pausal/contextual forms in

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[10] MSA is the Arabic dialect which Arabs communicate with in the formal practice of the language. Hence, it is highly practiced in terms of number of people who uses it.

the Classical Arabic. To account for the pausal phenomenon McCarthy employs the descriptive tools of Harmonic Serialism which is another version of OT.

On the other hand, the case markers did not receive the same amount of attention which the epenthetic markers have, as far as the sources that I have consulted. Yet, McCarthy's (1979/1985) briefly provides a theoretical account for the case marking in Classical Arabic within his proposed theoretical model to capture the complexity of Semitic languages morphology.

3.4.1.2 Hamid (1984)

Broselow (1992: 12) was found informing that she follows 'Hamid (1984) in assuming that Classical Arabic CVCC nouns have been reanalysed as CVCVC'. I consider this 'assuming', which is attributed to Hamid (1984), a different phrasing for the tested part of the hypothesis of this study. Hamid's (1984) study was found presenting in its first chapter (1984: 13-33) 'NOTES ON THE HISTORICAL DEVELOPMENT' of aspects in Sudanese Colloquial Arabic (SCA). Hamid's observations on what he termed 'Tri-radical Forms' are of high significance for this study. Therefore, the section '1.4' in Hamid (1984: 17-33) is reviewed critically in this subsection. At the beginning of his section Hamid (1984) was found stating that:

> From the examination of 400 words of tri-radicals, I noticed that all those of CVCC structure in SA have developed to CVCVC structure in SCA. The explanation of this phenomenon goes as follows: Through historical development, case endings were lost from nouns of CVCC structure resulting in a cluster of two consonants at the end of the word, violating the constraint on syllable structure of the language which allows only CV, CVV, CVC and CVVC, but not CVCC unless a geminate cluster at the end of the word. Consequently, a supporting vowel was inserted to bring the cluster in line with the syllable requirement. Thus given the representation $C\ V\ C\ C$ were the final consonant is not incorporated in

> to a syllable, a supporting vowel was inserted before the unincorporated consonant to give the acceptable structure $C\ V\ C\ V\ C$

(Hamid, 1984: 17)

Critically, it can be seen that Hamid is basing his observations on a systematic methodology. He formed a corpus of 400 tri-radicals nouns, observed the data examining them, made conclusions, suggested a main generalization and gave interpretations. However,

in contrast to this study, which tests both stems and their paradigms, Hamid's observations and conclusions are formed only on the stems, (i.e., what is usually referred to as stem-form in this study). Yet, contrary to this study, it is noticed that he considers relative words that belong to the same word-family of a stem. To explain, in Arabic CVCC stems are linguistically masculine, which through suffixing /-at/, the feminine stem counterpart is formed. Hamid devotes some attention on the counterpart feminine stems.

Regarding Hamid's corpus, even though he specifies the sources he used to collect its content of CVCC stems but he does not elaborate upon the criteria that controlled selecting the words or the steps that were made to collect them. He declares that his corpus is collected from: his 'own vocabulary', a dictionary of SCA and SA dictionaries (more details appear in Hamid, 1984: 33, footnote 2). Nonetheless, the corpus of 400 tri-radical nouns is provided in 'Appendix A' in his thesis. Three types of information are provided in this Appendix the standard form of a CVCC stem, its realization in SCA and a gloss.

It is inferred that Hamid views SA as the ancestor of SCA. I follow Hamid in assuming that SA is an ancestor of the modern Arabic dialects without disregarding the possibilities of other dialectal ancestors as will be seen when introducing the conceptualization of the term Classical Arabic. However, so that Hamid's stance is comprehended, it is viewed that SA is the most common variation in Classical Arabic which the early grammarians have standardized. Consequently; it seems that Hamid has the stance that the most common variation in the classical era, (i.e., SA) is the ancestor.

As can be seen from the quotation, Hamid is not giving an *assumption* rather he is giving a *generalization* and *interpretations* for the results of his examination for the tri-radical nouns. His generalization is that all CVCC stems of SA, (i.e., the ancestor) have reanalysed to CVCVC in the descendant SCA. His interpretation is that this observed reanalysis is because the ancestor lost the vocalic case endings. Since these case endings were working on satisfying a syllabic requirement of syllable structure, their loss caused a violation for a constraint in 'the language'. To resolve this violation, Hamid concludes that vowel insertion has been operated which led to the reanalyses of CVCC stems to be CVCVC. However, the generalization that all CVCC became CVCVC in SCA is an overgeneralization considering Hamid's own results. Hamid in this generalization is not considering his other conclusions which appear in his discussion for his observations. There are as well some ambiguities/mistakes which need to be clarified.

For example, in the above quotation, Hamid (1984) says the loss violated 'the constraint on syllable structure of the language which allows only CV, CVV, CVC and

CVVC, but not CVCC unless a geminate cluster at the end of the word.' This statement is unclear in terms of what Hamid is referring to with 'the language' which its constraint was violated, (i.e., is 'the language' SA or SCA).

Nonetheless, if he is referring to SA then the statement is incorrect. This is because the syllable inventory of SA allows unconditionally CV, CVV and CVC to surface. Therefore, these syllable types are unmarked in SA, and as far as I know they are unmarked in all Arabic varieties whether in the classical or the modern era. On contrary, the syllables CVVC and CVCC are conditioned in the classical era and the modern Arabic dialects vary in terms of surfacing these two superheavy syllables. Based on the SA, the most common and known variation of the classical era, these two superheavy syllables are restricted to the pausal position in a sentence. Both fields of research ALT and WL are acknowledged with this. The criticality of the pausal position and the heaviness of a syllable were demonstrated centuries ago by the grammarians within their own terminologies, and I know that McCarthy (1979/1985: 26-28) establishes this fact in Western phonology through introducing the SA within the term Classical Arabic in this specific work. Accordingly, both syllables CVVC and CVCC are unique in Arabic phonology. Yet, there are substantiations that demonstrate that Arabic phonology in general seems to tolerate the CVVC more than CVCC. This issue is discussed in the chapters four and five.

Returning to the extracted long quotation, Hamid's words 'but not CVCC unless a geminate cluster at the end of the word' excludes the CVC_iC_i. Thus, I understand that Hamid is saying that the CVC_iC_i type of a syllable is among the unrestricted syllable types of 'the language'. However, if 'the language' that he is referring at is SA, then he made another mistake. I know that if the final-cluster is underlyingly a geminate, standardly the pausal forms will surface by deleting not only the vocalic marker but also the final-consonant, (e.g., *ħurr-u-n* "a free.Nom" → *ħur* "a free.Pausal" and *ʔal-ħurr-u* "the free.Nom" → *ʔal-ħur* "the free.Pausal"). Yet, Hamid (1984) might be referring with 'the language' to SCA in particular that he repeats the information at the end of the section '1.4'. In this repetition, Hamid (1984: 31) states that 'all structures of CVCC resulting from the loss of case endings in SA, have developed to CVCVC structures in SCA, since a final cluster of two consonants (unless geminate) is not permitted by its syllable structure'. If so, then I cannot comment critically as I am not familiar with SCA.

In terms of Hamid's presentation for the data of CVCC stems, it was noticed that he divided them to CiCC, CuCC and CaCC advising that 250 words of his corpus were CaCC. It is noticed as well that in his text the stems that consist of glides were presented as subsections

53

for the CaCC. The glide is a component of the final consonant cluster. Hence, he presents them as CawC, CayC, CaCw, and CaCy. However, it was noticed that among his words that were categorized as CaCw the word *ħulw*. The mistake in this is that the nucleus of this word is the round /u/ which means that it should be categorized among the category CaCw.

Additionally, the generalization that all CVCC stems of the ancestor reanalysed to CVCVC in SCA is conclusively an overgeneralization as said before. Hamid's data, as he presents and illustrates, demonstrates that CVCC stems are surfacing in SCA as either: CVCVC, CVVC or CVCV. As will be seen next, he gives observations and infers conclusions that are of interest for this study.

He observed that CaCw and CaCy surface in SCA as CaCu and CaCi. From this Hamid concludes that the final glides underwent glide vocalization that resulted in a CVCV structure. This observation and conclusion is agreed on. It can be confirmed that this process happens in other modern Arabic dialects as will be seen in the results of this study, (i.e., chapter four).

He also observed that CawC and CayC surface in SCA as CooC and CeeC. From this observation he makes conclusions about the combination of the back vowel and the glide. A first conclusion that he makes is that this process 'introduced to the vowel system of SCA two new sounds that did not exist in the vowel system of its proto-language' (Hamid, 1984: 28). He continues, observing, that these long vowels /ee/ and /oo/ does not have 'short counterparts in the vowel system of SCA, as the other vowels have' (Hamid, 1984: 28). Thus, he makes another conclusion from this observation, that is, '[a] in SCA may better be characterized as a central vowel, since it has undergone the change to vowel [-back] and to vowel [+back] before the glide [-back] and glide [+back], respectively' (Hamid, 1984: 28). He suggests the following rules to capture his conclusion:

7a. ay → ee /___C
7b. aw →oo /___C

These two rules are then followed with this reasoning from Hamid (1984: 28):

> Each of these two rules, however, can be argued to involve two stages of development; one in which a became e before y, or o before w, and the second in which y and w were dropped resulting in compensatory lengthening of the preceding vowel. Although this argument seems to be acceptable in terms of phonological naturalness, we can not[sic] accept it because it will lead to the assumption that the vowel system of SCA has short [e] and short [o], a claim that we have no evidence for, neither historically nor synchronically. So, the best way, I believe, to justify the above change is to say that SCA can not[sic] tolerate diphthong vowels.

Since the process that Hamid is explaining involves a consonant changes to a vowel then this process is a vocalization. Since Hamid is dealing with the glides then this vocalisation process is another pattern of glide vocalization. However, even though Hamid (1984) knows the term glide vocalization but he does not use it to refer to the process here. Another note is that he refers to the combination 'ay' and 'aw' as diphthong vowels and informs that their shift to /ee/ and /oo/ is because diphthongs are not tolerated in SCA. In other words, for Hamid, the evolution of /ee/ and /oo/ in the vocalic inventory of SCA is because the diphthongs 'ay' and 'aw' are not tolerated. SA is the ancestor of SCA based on Hamid's illustration. It is very well-known that SA does not possess diphthongs. SA, as illustrated in chapter one, has mainly six vowels; three shorts and three longs. Thus, the question that raises here is why Hamid is referring to the combinations 'ay' and 'aw' as diphthongs since the ancestor that he is assuming is very well-known not to have any diphthong?

Several answers might explain his act; the most straightforward is that he does not know/understand well the definition behind the term diphthong. This is possible considering that the term, as far as Crystal (2007), has more than three concepts. Two of these are closely related and are used in phonetics. However, another possible answer behind his act is what he visualizes as the 'proto-language' of all Arabic varieties, considering that he uses this term. I think that it might be that Hamid has the assumption that Classical Arabic is the 'proto-language' of all Arabic varieties including the ancestor of SCA, that is, SA. Other possibility is that he is confused between what is SA and Classical Arabic. My experience with the WL literature on Classical Arabic made me see that in the type of words that Hamid is investigating it is already has been established that the combinations 'ay' and 'aw' are diphthongs. Considering, my knowledge at the beginning of this research with the terminologies of Western phonology, my knowledge with terminologies of ALT and my own perception I was myself confused. The confusion increased in that time because Classical Arabic as a term is ambiguous in terms of what it refers to in the literature. In addition, notably in WL literature, linguists may use the term Classical Arabic as a synonym for SA which does not help since they are not the same. This study utilizes the term Classical Arabic among its main terminologies. Therefore, section 3.5.2 in this chapter is devoted for this term.

Nonetheless, as will be seen, this study views the combinations 'ay' and 'aw' as a vowel and a consonant glide, hence, they are /aj/ and /aw/. The reason that makes me take

this phonological decision is that no documentations were found indicating that surfacing the glide in the classical era differed in CVGC stems. Consequently, in contrast to Hamid, I think that surfacing /oo/ and /ee/ instead of /aj/ and /aw/ is a repair strategy employed by the Arabic phonology to prevent the realization of the superheavy syllable CVCC, or to be more precise to prevent CVGC from surfacing. The phonetic characteristic of the two glides were used economically instead of implementing a vowel insertion or a case metathesis. Hamid did have expectation that in CaGC an epenthetic /i/ should surface but instead he discovered two types of long monophthong surfacing. Therefore, I think the two glide vocalization processes which Hamid discovered are another support for the valid of the thesis of this study.

As for Hamid's assumption that the long monophthong [oo] is a new sound in Arabic phonology, I think he might be right. Therefore, I adopt his view and transcription. In contrast, I do not think that he is correct about the long monophthong [ee]. As said, in chapter one, [ee] surfaces in the classical era as an allophone that is restricted in specific environments.

Regarding the epenthetic vowels that he observed breaking the consonants of the superheavy CVCC, Hamid observes that generally it is the front /i/ what gets inserted. However, he observes as well that the back /a/ and the round /u/ also surface to break up the cluster in specific environments. He also observes the role of vowel harmony in the insertion. The following are among his findings:

i. In CiCC stems, the epenthetic /i/ appears to surface CiCiC. One word exhibited the surfaced form CuCuC. These findings made him conclude that /i/ 'was inserted in harmony with preceding vowel'. He interpreted the CuCuC by assuming that the lexical /i/ was substituted with /u/, and then /u/ was inserted to break up the cluster in harmony with the new phonetic value of the preceding vowel.

ii. In CuCC stems, the epenthetic /u/ breaks stems; hence, these stems surface as CuCuC. However, Hamid found 3 words of his data exhibited CiCiC surface form.

iii. In CaCC stems, 'variation in the quality of the inserted vowel' was observed. Hamid concludes from the variations that: /a/ inserted after guttural consonants, /u/ inserted 'more often before sonorant consonants, either nasal or liquid and /i/ is the more likely inserted vowel in these stems.

iv. Because the epenthetic /i/ realizes in more phonological environments and generally occurs more than the other epenthetic vowels, Hamid concludes that /i/ is the basic epenthetic vowel.

The conclusion that /i/ is the basic epenthetic vowel is thought incorrect. The logic behind this thinking is that phonology would make more effort by implementing a basic epenthetic vowel that has to satisfy a vowel harmony condition in different phonological environments. To explain, CuCC stems surface in SCA as CuCuC. According to Hamid's conclusion, we

have to assume that in CuCC, the basic epenthetic /i/ was inserted first and then this epenthetic /i/ was substituted with the round /u/ to satisfy the vowel harmony. This might be possible, but phonology would have operated two processes to chive goals that can be achieved within only one process, (i.e., inserting the suitable vowel that satisfies simultaneously the syllabic requirement, the moraic requirement and vowel harmony). Thus, it is thought that phonology started by inserting a suitable vowel for each environment of CVCCs. Yet, Hamid contradicts the front basic epenthetic vowel thesis as can be seen from (i). In (i) he explains the one realization of C**u**C*u*C instead of Ci*Ci*C in CiCC stems by assuming that the inserted vowel is /u/ not /i/. Furthermore, he assumes that this round insertion was preceded by a substitution process in which the lexical front was substituted with the round /u/. Thus, he displays awareness of two things, Firstly, awareness that phonology employs u-insertion. The second is the awareness that phonology targets the quality of lexical vowels through a process of vowel-substitution. However, the contradictory between his basic epenthetic vowel and the explanation in (i) raises doubts about the degree of awareness. Being aware of something does not necessarily mean that this awareness is deep. Therefore, it is true that Hamid recognizes the u-insertion process and the vowel-substitution process but I think that this recognition did not include awareness that these processes falsify his basic epenthetic vowel thesis.

On the other hand, it is thought that not all what we are witnessing between the consonant clusters is due to insertion. The quality of the vowels that is similar to the case vocalic endings should not be disregarded nor should we disregard the case metathesis process which Sibawaih (148-180 A.H. /765-796 C.E.) discusses in his book. Therefore, a logical assumption is that some of the vowels that break up the final clusters in CVCC stems in the modern era might be historically due to case metathesis not vowel insertion.

Another point which Hamid (1984: 29-30) raises is that 'While this development seems to have taken place in other dialects such as the Eastern dialects, it has not taken place in dialects such as Egyptian, Libyan, Tunisian, Algerian, Moroccan, and Maltese (cf. Crewe, 1973)'. The development which Hamid is talking about is the development of CVCC stems to CVCVC. Nonetheless, the information that he is giving is not correct. As far as my knowledge, the expression the 'Eastern dialects'[11] refers to Syria, Iraq, Lebanon, Jordon, the Arabian Gulf countries, Egypt and Sudan. Thus, firstly excluding Egyptian Arabic from what

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[11] Observe that the Arabic land today extends to those countries which Hamid is specifying with the exclusion to Maltese. Based on specific characteristics and historical developments there is a classification for the Arabic countries to Eastern dialects/countries and Western dialects/countries. I think Hamid is using this classification which is presumably those who works on Arabic are familiar with.

is referred to by the Eastern dialects is conceptually in correct. Secondly, the literature also the results of this study show that Egyptian Arabic manifests the vowel insertion but in the inflective level. Kuwaiti ħader Arabic, which is one of the Arabian Gulf dialects, does not necessarily manifest the vowel insertion in the stem level as will be seen from the results in chapter four. Moroccan Arabic, which one of its variations is investigated in this study, also manifests the insertion despite what is said about this dialect's tendency for surfacing clusters. In addition, I know that Libyan Arabic also manifest the vowel insertion. In fact, my overall results indicate that *all* modern Arabic dialects display the insertion in some level of their grammar.

As for the theoretical analysis that Hamid (1984) develops to account for the CVCC stems and the resulted surfaces, some of its relevant issues are discussed in chapter 5 of this thesis.

3.4.1.3 Shaaban (1977)

Farwaneh (2009: 98, in footnote 10) briefly acknowledges that inserting /-in/ between the active participle stem and the pronominal suffix in Omani Arabic does not have a clear function. However, she attributes to Shaaban (1977) the explanation for this /-in/ as a *remnant* for the genitive marker /-i/ and the nunation marker /-n/. These two markers surface as a combination /-i-n/ in Classical Arabic, SA and MSA. This combination marks the indefinite genitive nominal words in these varieties of Arabic. She also refers to Eksell (1984) as a better source to understand the /-in/ which she describes as 'this intriguing morphological phenomenon of Bedouin Arabic' (Farwaneh; 2009: 98). Eksell's (1984) work is reviewed within the Arabicists' contribution section, as this section devotes some attention on Shaaban's (1977) data and views.

In addition to the interpretation which Farwaneh attributes to Shaaban (1977: 86), he provides in footnote number 5 (see: Shaaban, 1977: 122) another possible interpretation for the origin of /-in/ in Omani Arabic. He points out that some may argue that /-in/ originated from the suffix /-anna/ which has the meaning of assertion. Shaaban (1977: 86) describes the first interpretation as 'the most plausible explanation'. I really cannot confirm which interpretation is the most plausible explanation. I think more data is needed to comprehend the insertion of /-in/. However, the data that he is discussing is not of this study's concern because it does not include CVCC stems.

3.4.1.4 McCarthy (2011)

The critical evaluation for McCarthy's (2011) paper focuses on those issues that are related to this study, in particular his account for a case metathesis known to exist in the classical era. In this focus, it is argued that the proposed account does not capture the distinctive of case metathesis process which motivates banning the CVCC syllable from surfacing.

Even though McCarthy's (2011) paper is supposed to be theorizing about Classical Arabic, a term that is very critical to be used, McCarthy (2011) does not define what he means by Classical Arabic. The validity of the data which he bases his generalization on is thus in a question in terms of its suitability. To clarify, McCarthy cites his Classical Arabic data to:

> The principal Western references on Classical Arabic pausal forms are Birkeland (1940), Fleisch (1968: 28--30), Hoberman (1995), Howell (1986: 772--929), Schaade (1911: 55-63), and Wright (1971: vol. II, 368--73). For evidence that the pausal forms were productive in Classical Arabic, see Hoberman (1995: 162--4).
> (McCarthy; 2011: 21, footnote number 2)

No consideration appears to be formed to grant consistency in the collected data which the theoretical proposal is based on. As far as my experience with the work of the Arabcists, there is a disagreement of what is Classical Arabic. Consequently, several complications concerning McCarthy's (2011) data are noticed leading to the invalid of his main generalization 'pausal forms must end in a heavy syllable' (McCarthy, 2011: 1). I argue that this generalization display overgeneralizations. Firstly, different dialectal variations, (i.e., the dialects of the classical era) are presented as one language variety, (i.e., Classical Arabic).

Secondly, all kinds of heavy syllables are treated equally. Hence, the CVC is equal to CVCC. Thirdly, there seems to be a presupposition that in Arabic there is verb-noun symmetry, which is incorrect supposition. Next, the consequences of these overgeneralizations are illustrated.

Regarding the first overgeneralization, even though the data in McCarthy (2011) are from different classical variations, (i.e., colloquial and the standardized) they are presented as if they are extracted from one variety. Therefore, distinctions between the variations of the classical era are absent. As a consequence for this absence, two things are lacking in McCarthy's (2011) data, (i.e., a recognition for variations of that era and a chronological recognition for the variations). Lacking the chronological recognition for the variations of that era does not impact the generalization because McCarthy (2011) was giving a synchronic

account for the data. In contrast, not recognizing the variations of the classical era led to incorrect conclusions. That the Arabic data in McCarthy (2011) is not from one variety is detectable through comparing it with the data that appears in Sibawaih's book.

To explain, the case metathesis example in McCarthy (2011) is from a variation produced by some Arabs of the classical era. Not all vocalic case markers undergo metathesis when pausing in that variation. Rather, those Arabs metathesized only the genitive and nominative vocalic markers (see Sibawaih's book, Haaruun's edition, 2009, vol.4: 173-174). McCarthy (2011) acknowledges that it is mainly the nominative and accusative vocalic markers that are metathesized but does not appear to know that the case metathesis in CVCC nominal stems is a colloquial variation of the classical era. The most common variation in that era, generally, displays case deletion for the vocalic case inflection in the pausal form of this type of nominal stem. This most common variation is the standardized variation which is today it is called in WL as SA as mentioned before.

In relation to the second overgeneralization, that all kinds of heavy syllables are treated equally is critical because in such theoretical account the heavy CVC syllable type is equal to the superheavy syllable type CVCC. Regardless of the already noted cross-linguistically distinctiveness between these two types of syllables, in Arabic the distinction is highly distinctive between them, synchronically and diachronically. The CVC syllable type in contrast to the CVCC syllable type is not restricted in Arabic. To explain, in the earliest stage of Arabic that we know about, the syllable CVCC documented to be limited to the final-position of a sentence, hence to the pausal position. In addition, the phonology of some modern Arabic dialects still displays resistance for surfacing CVCC. As far as McCarthy, his (1979/1985: 26-28) which is also about Classical Arabic, shows that he establishes the uniqueness of the relationship between the limited occurrence of the superheavy CVCC and pausal position. Thus, it was expected that he implements his establishment in his new account. As a result of not implementing the establishment, the proposed theoretical account displays some mistakes which are explained next because they are connected to the hypothesis of this study.

Firstly, McCarthy (2011) is correct in his conclusion that this metathesis of case suffix 'avoids the final consonant cluster' McCarthy (2011: 10). The contextual form *ʔal-bakr-u*[12] surfaces as *ʔal-bak<u>u</u>r* in the pausal position is a substantiation that supports this conclusion.

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[12] The meaning which McCarthy (2011) documents in the gloss is 'the young camel'. However, this word is also a name of a very distinguished Arabic tribe of that era, and it is used as a person name. On the other hand, this word appears in Sibawaih's book indefinite; however, I transcribed it here as it appears in McCarthy (2011: 1).

However, the proposed theoretical treatment contradicts the above conclusion. As can be seen from McCarthy's generalization, the metathesis is treated as a process that motivates ending the pausal form with a heavy syllable whereas in reality the process is provoked to prevent a form of heavy syllable.

Secondly, as a consequence for this treatment, in McCarthy's analysis the case deletion and the case metathesis are presented as two processes that have the same goal which is incorrect. Even though it is correct that the application of the two processes ends with forming a heavy syllable but essentially the essence of what each process is really doing in the structure is different. To explain, the case deletion is forming complexity in coda whereas case metathesis is forming simplicity in coda. To reason this, consider the accusative, nominative and genitive forms of the same discussed word *ʔal-bakr-a*. The accusative form displays which a case deletion when pausing. Therefore, what is produced is *ʔal-bakr-a→ ʔal-bakr*. As can be seen, the accusative deletion **forms** (i) a complex coda with a cluster of two consonants and a (ii) CVCC syllable type. On the other hand, the nominative metathesis is *ʔal-bakr-u→ ʔal-bak<u>u</u>r*. Notably, it **prevents** (i) a complex coda with a cluster of two consonants and a (ii) CVCC syllable type from surfacing.

Therefore, in contrast to McCarthy (2011), I consider the fact that the case metathesis prevents the realization of final CVCC syllable in the only position in which this syllable is allowed to surface in the Arabic language of that era. Within this consideration the case metathesis is viewed as a *repair strategy* to avoid innovation. It is employed to ***prevent** a specific novel form of heaviness, (i.e., CVCC) even though in doing this it in fact **generates** a canonical syllabic heaviness, (i.e., CVC).*

In another words, structurally, it is notable that McCarthy's example is a monosyllabic nominal stem with a *superheavy* syllable CVCC. Thus, the deletion of the case morpheme is what **generates** a *superheavy syllable*, whereas the metathesis **prevents** the *superheavy syllable*. In other words, the *type* of heaviness is the critical issue in the pausal forms of such monosyllabic nominal words since it relates it to innovation in the phonology of the Arabic language.

However, McCarthy's (2011) main generalization assumes that the pausal forms have to end with a heavy syllable. It might be argued that McCarthy is correct in the sense that the genitive and nominative pausal form, (i.e., *ʔal-ba.k<u>u</u>r* and *ʔal-ba.k<u>i</u>r*) do indeed end with *a form* of heavy syllable as *kur* and *kir* are heavy syllables. The same goes for the syllable *bakr* of the accusative pausal form *ʔal-bakr*, it is indeed a heavy syllable. Therefore, McCarthy's generalization bases its analysis on the reality that *kur*, *kir* and *bakr* are all at the end heavy

syllables. Yet, I argue that this straightforward analysis does not capture several facts. In the first place, it does not realize the role of the vocalic short case markers in preventing the realization of CVCC syllable type in the contextual forms. Thus, synchronically the proposed analysis does not recognize that this syllable type in that era never occurs contextually in nominal words due to the phonological function of the vocalic markers.

In addition, as said, although McCarthy's (2011) analysis recognizes that the case metathesis resolves the complex coda, it does not give an account for the synchronic tolerant for syllabic heaviness. This is because in the proposed analysis the distinction between CVC and CVCC is overlooked. Accordingly, the underlined final syllable in both *ʔal-bakr-u* →*ʔal-bak<u>ur</u>* and *ʔal-bakr-a* →*ʔal-<u>bakr</u>* are not accounted for in the proposed analysis as two distinct type of heaviness.

Another issue that is not considered in McCarthy's (2011) analysis for the metathesis process is the role of minimal word condition in the formation of the pausal form. This is elaborated upon more in chapter five. As will be seen, in contrast to McCarthy (2011), the proposed analysis in chapter five recognizes the moraic weight.

Nonetheless, because this study has both diachronic and synchronic perspectives in approaching the loss of the vocalic case morphemes and the emergence of the epenthetic vowels, the discovery that there were Arabs in the eighth century avoided the CVCC syllable type through case metathesis, is of significance for this study. From a diachronic perspective, it gives the original thesis of this study a more valid position. This is because it shows evidently that phonology has reacted to prevent the innovation of CVCC syllable type. It also shows that the reaction is not new rather it can be traced as early as the 8th century. In addition, evidently it is a case metathesis not vowel insertion what one finds documented as a mechanism employed by phonology to avoid the innovation. From a synchronic perspective, the investigation is expected to include, therefore, finding out whether the two mechanisms, (i.e., case metathesis and vowel epenthesis) were evolved in the same time to avoid the phonological innovation. Hence, a new task for this research is answering the question *did the two processes evolve at the same time?*

The third overgeneralization that is noticed in McCarthy (2011) is the presupposing that there is verb-noun symmetry in Arabic. To explain, even though McCarthy (2011) does not actually state that there is verb-noun symmetry but it was noticed that he affirms generalization on nominal words based on verbal data. The incorrect conclusions that were made because of this presupposition are noticeable but I will not pursue them. However, I pursue the verb-noun symmetry in Arabic as will be seen in chapter four and five. The

argument that I will go for is that even though verb-noun symmetries are noticed in Arabic, there are verb-noun asymmetries of significance that requires attentiveness from a theorist when making a generalization.

3.4.2 The historical linguists' contributions

The historical linguists, (i.e., the Arabicists), have already remarked upon the similarities between the vocalic case endings and the epenthetic vowels that are witnessed in some modern Arabic varieties. However, it is noted that they interpret these similarities from a historical perspective in a way that does not let the data lead the investigation. Thus, it is not always that morpho-phonological and morpho-syntactical related aspects what are being discussed to make conclusions, rather, notably non-linguistic data have priority in such research. Nonetheless, it was found that some Arabicists interpret the epenthetic vowels as a *remnant* (e.g. Birkeland, 1952; according to Ferguson 1954), others as a *consequence* (e.g. Fisher and Jastrow, 1980; according to Owens 1998b and 2006). The more recent view presented by Owens suggests that 'the Classical Arabic system grew *in part* at least out of epenthetic phenomena' (1998b: 220).

A notable aspect of these studies is that, although they recognize the parallels between the case endings and the epenthetic vowels, they do not seek, as far as I can see, to provide a detailed morpho-phonological investigation. They mainly concern the investigation to the classification of the history of Arabic language old→Neo model for: (Birkeland 1952 as I have understood from Ferguson's 1954 review) and (Fisher and Jastrow 1980 according to Owens 1998b: 218). Owens' (1998a; 1998b; 2006) model seems more complex as there is, in my view, too much assumption in favour of language stability than language change, an issue that is already admitted in Owens (2006: 268). Nonetheless, Fisher and Jastrow's (1980, as appeared in Owens 1998b) is of some interest for this study because of the noted similarity between the hypothesis which this study is postulating and their analysis for the epenthetic vowels to be a consequence of the loss of case markers. Therefore, some attention is given to this research following this Eksell's (1984) paper is looked at.

3.4.2.1 Fischer and Jastrow's research 1980

Owens (1998b: 218) reviews Fischer and Jastrow's research 1980 stating that

> The loss of the final vocalic case markers, according to proponents of this theory, had consequences for syllable structure (Blau, 1981: 3, Fischer and Jastrow, 1980: 40). Coupled with a tendency of short high vowels to be deleted in open syllables (see 3.3.3), this led to a basic reorganization of syllable structure in Neo-Arabic in which the insertion of epenthetic vowels plays a significant role. This is

63

because, like Classical Arabic, the majority of dialects have maintained a basic syllable structure constraint disallowing sequences of three consonants. Thus, assuming the Old → Neo-Arabic model for the moment, given a nominal form like *kalb-V-hā (V =case) 'her dog', the loss of the case vowel in dialects leads to unacceptable CC-ha structures. As Fischer and Jastrow (1980: 41) point out, there are generally two solutions to this problem, both involving the insertion of an epenthetic vowel. In Eastern Libyan Arabic, for example, the epenthetic vowel (underlined) comes between the first two consonants, kal<u>i</u>b-ha, in Nigerian Arabic between the last two, kalb<u>a</u>-ha.

Owens in his (2006: 52) introduces the proposal of Fischer and Jastrow 1980 as 'Short vowels are stable and/or contrastive in Old Arabic, while in Neo-Arabic they have changed in such a way that their stability and contrastive value is reduced.' Owens (2006) informs that Fischer and Jastrow's 1980 proposal refers to all types of vowels, (i.e., the lexical and the morpho-syntactical). Owens' illustration shows that they propose that the loss of case marking has consequences on the syllable structure. Contrasting the modern Arabic dialects with the 'old Arabic', according to Fischer and Jastrow 1980, 'led to a basic reorganization of syllable structure'. In this reorganization the epenthetic vowels are viewed a significant because of the role that they play to maintain 'a basic syllable structure constraint disallowing sequences of three consonants'. However, even though the epenthetic vowels in the modern dialects does indeed have a role in preventing complexity from surfacing in the Arabic dialects but in reality the issue is more complicated than 'disallowing sequences of three consonants'. To explain, the data that appear in the quotation are used to make a clarification.

8a. /kalb +ha/ → [ka.l**i**b-ha]   "dog.3Pers.Sing.Fem" (Eastern Libyan Arabic)
8b. /kalb +ha/ → [kal.b**a**-ha]   "dog.3Pers.Sing.Fem" (Nigerian Arabic)

The data display two forms of vowel insertion; the first form is inserting the vowel between the first two consonants of the sequence of three consonants (8a). The locus of vowel insertion is between the root consonants. In the second form, the vowel is inserted between the last two consonants of the final consonant sequence which also consists of three consonants (8b). However, this time the epenthetic vowel is inserted between a root consonant and consonant-initial suffix. Note that both (8a) and (8b) are inflective forms of a CVCC stem word. Thus, the set of data is not complete as only one form in the set is offered. This is the form that is inflected with a consonant-initial suffix, (i.e., [-ha] "her"). The phonological situation is complex when including the stem-form and the inflective-forms with vowel-initial suffix. In other words, consideration for the morphology and phonology

interface is absent in Fischer and Jastrow's research 1980 as far as I can see. This study as will be seen makes this consideration.

On the other hand, two observations are attributed to Fischer and Jastrow 1980 by Owens (2006) are relevant to this study. The first is that 'The 2FSG object suffix underwent the change in Neo-Arabic –ki → ik. Many dialects, however, maintain invariable –*ki*' (Owens, 2006: 50). The second is that 'the 3.MSG object pronoun-*hu* and 3.MPL object pronoun-*hum* often (in the Classical sources both variants are attested) have the allomorphs – *hi/-him* after an /i/ (or palatal /y/)' (Owens, 2006: 59). Since the two observations are about the inflection and are indicating to two things (i) a metathesis in a suffix has emerged which worked to shift the consonant-initial suffix to be a vowel-initial suffix, and (ii) there are allomorphs for some suffixes that are restricted to phonological environments because of a phonological requirement. Clearly, this phonological requirement is vowel harmony. Yet, it should be mentioned that the allomorphs, which Owens is specifying, are attested not only in the classical era but also in the modern era in the two variations that are known as SA and MSA. However, in terms of the triggers, which he is specifying, I am not sure for 'palatal /y/'. The data, which he provides in his text, does not include palatal and gives a mixture of nominal and verbal words. In addition, he does not inform readers that /–hu/, /-hum/, /-hi/ and /-him/ are suffixes with two functions as they can be attached to nominal words as possessive suffixes and to verbal words as object suffixes. Nonetheless, in this study, I argue that harmonizing the vocalic component of words is a phonological target in Arabic phonology. I also argue that morphology contributed to resolve the complexity which the structures become threaten due to the loss of case inflection by reducing its set of consonant-initial suffixes in the favour of increasing its set of vowel-initial suffixes.

3.4.2.2 Eksell (1984)

On the other hand, by looking at Eksell (1984: 3) it turns out that the infixation of /-in/ is noted not only in Oman (see Shaaban, 1977) but it is also attested in other regions 'Daṯīna, Ḥaḍramawt, Yemen, the Syrian desert, the Gulf, and Uzbekistan'. Furthermore, from Eksell (1984) it can be seen that this /-in/ has undergone several discussions by Arabicists, (e.g., Landberg, Brockelmann and Nöldeke). Possible hypotheses have been suggested in these discussions regarding the function of /-in/, which has been termed as n-element, in the modern Arabic dialects and its origin.

3.5   The designed method to test the hypothesis

This section explains several issues related to how the hypothesis of this study is going to be tested. This includes forming a primarily typology of final-codas of CVCC stems in the modern Arabic dialects in both stem-forms and inflected-forms. Then the way this study utilizes the term Classical Arabic is acknowledged. Following that, since a form of comparison is intended to be applied here on systematic bases, where some data from the classical era is compared to its correspondent from the modern era, I expound upon the nature of this comparison. In addition, the sources that are used to obtain the classical data and the modern data are alluded upon. Furthermore, the type of nominal words and the dialects that are part of the investigation are specified. The illustration compromises the criteria that determined the selected type of words and dialects. Finally, I provide justifications behind the use of OT as a framework to account for the data.

3.5.1   Forming a primary typology of final-codas

To specify the modern Arabic dialects that will be involved in the investigation, a primary typology is formed by utilizing some literature. The goal of the typology is to find out the types of final-codas of nominal stems that surface in the modern Arabic dialects. The nominal stems/roots that are surveyed are of the type CVCC. I looked in mainly four sources and for both the stem-forms and inflected-forms of CVCC. The sources that were used for this primarily typology are the following. The first is Watson (2007) which offers wide set of data from many modern Arabic dialects. The second source is Abu Salim (1980) which approaches the Palestinian Arabic. The focus of the paper was on epenthesis and geminate. His data contains many monosyllabic nominal stems. The third is Heath (2002) who offers detailed information about Moroccan Arabic. Finally, Broselow (1992) was used as a secondary source for Iraqi Arabic. Appendix 1 provides a summary of what was found in these sources. In this appendix I give more detailed citation for the data and I provid the researchers' generalizations. Yet, observe that I mainly offer some of the data that appear in the above sources. Moreover, observe that whether below or in the appendix 1 the data are transcribed as appear in the sources.

The results were formed through implementing (i) the literatures, (ii) my own knowledge with modern Arabic dialect through different forms of communications (iii) and intuition as a native Kuwaiti ħader Arabic speaker.

Firstly, there are modern Arabic dialects that insert a vowel to ban the consonant cluster from surfacing in both the monosyllabic stem-form and in its paradigm. Iraqi Arabic is an example of these dialects as the data below show.

9a. /ʔibn/ → [ʔib*i*n] "son"
9b. /ʔibn+na / → [ʔib*i*n-na] "our son"   (Broselow, 1992)

In the previous data, the *italic* vowel /i/ is epenthesized to break the underlying consonant sequence /lb/. Note that because of the epenthetic vowel the number of syllables increased in (9a) and (9b). The monosyllabic stem surfaced as disyllabic CVC.Cv in (9a) whereas the bisyllabic stem surfaced as polysyllabic CV.CvC-CV.

A second pattern is Arabic varieties that ban consonant clusters from surfacing only when the heavy monosyllabic stem CVCC is inflected. Cairene Arabic is one of these varieties as the examples below show.

10a. /bint/ → [bint]   "daughter"
10b. /bint+na/→ [binˈt*i*-na] "our daughter" (Watson, 2007)

This example demonstrates that Cairene Arabic does not stand the complexity of coda except word-finally. The consonant-initial pronominal suffix /-ha/ in (10b) threatens the structure with the possibility of surfacing complexity of a cluster of three consonants. The *italic* vowel /*i*/ has been inserted as a strategy to avoid the realization of such expected complexity in a way that led to surface a word with three syllables instead of the expected disyllable word. The increase in the number of syllables is done through syllabifying the root's final-consonants as a coda for the first syllable and onset for the inserted vowel. Thus, instead of CVCC-CV we have CVC.Cv-CV in (10b). Therefore, what we see again is that avoiding the syllabic complexity through the vowel insertion has caused increase in the length of syllabic structures of words.

A third pattern that can be noted is those dialects that manifest three forms of realizations for the underlying final –*CC* cluster. As can be seen in (11d) and (11g) in Palestinian Arabic data the complex coda is realized, hence, the monosyllabic stem surface as a complex monosyllabic CVCC. However, it may get avoided by an epenthesis as can be seen in (11a) and (11b), hence, the monosyllabic stem surfaces as disyllabic CVC.CV. In addition, the examples (11c) and (11f) show that a monosyllabic heavy stem might have the two aforementioned surfaces, (i.e., CVCC and CVC.CV). Another distinctive that can be seen in this data is regarding the quality of the epenthetic vowel. Notably, whereas the epenthetic

vowel that breaks up the –CC sequence is the front /i/ in (11a), (11c) and (11f), it is the epenthetic round back vowel /u/ that breaks it up in (11b) and (11g). That these two monosyllabic stems underlyingly have /u/ indicates that the epenthesis process has in this dialect a consideration for the vowel harmony. This consideration for vowel harmony appears in both stem-forms and inflected-forms.

11a. ?ák<u>i</u>l   "food"
11b. fúr<u>u</u>n   "oven"
11c. dárs/dár<u>i</u>s   "lesson"
11d. ?úxt/*?úx<u>u</u>t "sister"
11e. ?ákil-ha   "her food"
11f. dárs-ha/dáris-ha "her lesson"
11g. ?úxt-ha/*?úx<u>u</u>t-ha "her sister"   (Abu Salim, 1980)

Moroccan Arabic dialects are known to surface syllabic complexity. Based on Heath (2002), the monosyllabic heavy stems CVCC are normally surfaced as CCVC. The following are examples for the realization for this type of sequence in Moroccan Arabic.

12a. šǝmš   šmǝš   "sun"
12b. xŭbz   xbǝz   "bread"
12c. *šakl* is either realized as *škel* or [ʃkl]   "form" (Heath, 2002)

The aforementioned patterns of codas are of interest in relation to understanding their historical development. I argue that such witnessed diversity is attributed to the loss of the vocalic markers.

Nonetheless, a specific note needs to be mentioned here. This *primarily* typology has undergone *several* modifications. This is because of not consulting the appropriate literature at the beginning of research. I also admit that my understanding for specific information which I have read later made me realize that there are things that I understood wrong. The modification led to reduce the number of the investigated modern dialects from five to four. Specific information about Moroccan Arabic has been modified. I preferred to introduce here the Palestinian Arabic dialect even though it is not the dialect that I tested because, in contrast to the tested dialect, (i.e., Kuwaiti ħader Arabic), the literature documents Palestinian Arabic dialect more thoroughly. On the other hand, Kuwaiti ħader Arabic is preferred over Palestinian Arabic when the selection for the investigated dialects was made. This preference is because I speak Kuwaiti ħader Arabic natively which means that it would be easier for me to collect data from this dialect. I have not included Hamid (1984) row data in this primarily typology because I became acknowledged with his study in a later stage of writing this thesis.

3.5.2 The term Classical Arabic

The Arabcists' term Classical Arabic should be taken with caution as it involves a great degree of ambiguity when defining the concept it refers to. The ambiguity in forming a concrete definition for the term stems from different factors that have contributed towards creating confusion. However, this study neither discusses the factors that have led to this ambiguity nor provides solutions. Rather, I mainly explain what does this term refers at in this study.

Classical Arabic (CA henceforth), conceptually, equals Modern Arabic in the sense that the two terms refer to practicing two forms of the Arabic language in communications, (i.e., a shared literacy language and a mother tongue dialect). The documentations that are possessed document this and assert this. These documentations include (i) the materials in the early sources; hence, the data. These also include the scholars' registrations, hence what is written about the Arabic language in the different eras. In addition, these include the books of the early grammarians which explicitly display a practice of a unified Arabic language even when introducing the Arabic dialects of their eras (see Sibawaih's book which belongs to the 8th century C.E. for example).

Therefore, the Arabic language situation in the classical era was similar to the current situation in the modern. In more words, our documentations explicitly show that the practice of two forms of language is as old as our documentations. Even the Arabs of pre-Islamic era practiced two forms of Arabic as far as the well-known sources. These forms are their mother dialectal tongues and a shared language which is found practiced in their poetry. This is why the term 'poetic *koinē*' is encountered in the Arabicists' research as a historical period in the Arabic language history, (e.g., Rabin 1955). The versification through this shared language among the Arabs has begun pre-Islamic era. Even though it is well-known that the shared Arabic language was practiced in the 6th C.E. but there is no documentation that demolishes the possibility that its practice has begun earlier as far as I know.

During the early Islamic era, the early grammarians started standardizing the shared literacy form of Arabic. Alfaaraabii[13] (d. 339 A.H. /950 C.E.) in his book *Alḥuruuf* (Mahdi's edition, 1990) documents the standardizing process of Arabic. In the position of interpreting the conduct of Arabs scholarly regarding their steps that they took to study their language and

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[13] He is well-known for his role in preserving the original Greek texts during the Middle Ages which comes from his commentaries on them.

standardize it theoretically, Alfaaraabii is found requesting from his addressees to meditate what the Arabs have been involved when studying their native language in the period 90-200 in the Islamic calendar. Making some calculations this means 708-815 in the Western calendar. In his text, Alfaaraabii explains the grammarians' collection for their Arabic linguistic data in terms of the excluded and included regions/tribes. He notes that there are tribes and people that their Arabic languages/dialects were considered as *reliable* by scholars of the early era and those who their Arabic languages/dialects were excluded and were deemed as *lacking reliability*. Alfaaraabii's words in his text are affirmative that the process of exclusion and inclusion for the Arabic dialects in that early era were mainly based on the amount of *interactions and communication with other non-Arab notions*. Hence, it can be said, that the main criterion for an Arabic form to be trusted and accepted by the grammarians of the early era is that it has to be attributed to specific regions/tribes. Accordingly, a main criterion in the standardization process that ended with the known SA is that a linguistic form has to be geographically conditioned so that it is trusted and accepted. Therefore, we know that SA was the more common variation, the more accepted and trusted in terms of being pure Arabic.

Consequently, SA is of significant for this study because the structures of its words are defiantly older than the structures of the modern Arabic dialects. In addition, these structures are evidently surfaced in the classical as not only a variation but a more common variation.

However, even though I guide the investigation in this study with these structures of SA, but I do not have the presumption that there are no other variations in the classical era. Moreover, I do not eliminate the possibility that the other variations might be the eldest. Rather, I benefit from the establishments that are known about SA by suggesting an analysis that assumes that the components in the structures of SA can be the underlying forms. As will be seen in chapter four and five, it is the word structures of SA that are the assumed underlying forms for all the modern *dialects* and the classical *variations*.

Bear in mind that in this study, the state of Arabic in the modern era is assessed through the modern Arabic *dialects*. In contrast, its state in the classical era is assessed through the *variations* that are found documented in the consulted source. The sources of the data of both eras are elaborated upon in section 3.5.4.

3.5.3   The comparison between Classical Arabic and Modern Arabic

Data from the classical period and data from the modern period are proposed in this study to be compared structurally. These data are collected based on a designed examination.

This is to restrict and limit the amount of speculations within the conclusions, and to ensure a greater valid of the results. Accordingly, from the outset, the examination is limited with only linguistic elements; namely, the phonological ones. Thus, the case markers from the classical era and the epenthetic vowels from the modern era are considered solely in terms of the phonological function they yield and their locus. As will be seen briefly in the following sections and with more details in chapter four, the examination is based on a set of phonological criteria that were intended to restrict the investigation in terms of modern dialects and type of words.

To form a type of systematic comparison between the CA variations and the modern Arabic dialects I divided the investigation into two epochs. The first is the modern day era tested through selected modern Arabic vernaculars. The second is the classical era which its span is presumed to be (6 – 10 C.E.) in ALT. The justification behind this presumed period is that it is the period which the grammarians thought that there are still Arabs who speak unchanged Arabic or Fusʕħaa. In ALT this period is termed as عصر الاحتجاج ʕasʕru ʔal-ʔiħtiʒaaʒ "The era of argument". I know that some Arabicists assert this span, (e.g., Fück 1951/2006). I recognize this period as the period in which CA was practiced. However, this period is too long. Thus, Thus, I selected a source that belongs to one century to look for the classical variations. This source belongs to the 7th century, (i.e., the Qur'anic readings).

I consciously avoided MSA in the modern data because I know that this dialect of Modern Arabic (MA henceforth) still preserve the case markers of classical era. Thus, since this study is considering the relationship between the *loss* of the case markers and the *emergence* of the epenthetic vowels it seemed, to me, that including MSA is inattentive.

3.5.4   The sources of the data

This section is concerned with the sources that were used to collect the classical data and the modern data. I start by first clarifying that whereas the collection of the modern data is based on the consent for what is a dialect, the collection of the classical data is based on the consent for what is a variety. This is followed by introducing the source of the modern data. Finally, the source of the classical data is introduced with some detail.

3.5.4.1 Dialect opposite variety

The main principle that is elaborated upon here is that whilst the modern data is approached dialectically, the classical data is approached based on the variations that are found in the Qur'anic readings of the investigated words. This is done because it is the much

easier way to obtain data in both eras. To explain, the dialects of the modern era are known and are attainable and it would not consume lots of effort to obtain data as communication with informants generally is an easy way to obtain data. In contrast, the dialects of the classical era, even though are known and attainable but a researcher needs to investigate wide range of literatures to have the details of these dialects and obtain data. On the other hand, considering the goal of this study, (i.e., finding the morpho-phonological change that resulted from the loss), the concern of this study is centred on surface forms of the nominal CVCC of both eras not on the dialects of both eras. This means that, essentially, this is not a dialectological study.

Therefore, because of the goal of this study, I decided that it is better to obtain the surfaced forms of both eras through the easier method. Collecting the data through communication with informants is generally a convenient method that consumes less time and efforts. Therefore, since I can apply this method to collect the data of the modern era, I decided to approach MA dialectally. In contrary, because I cannot apply this method to collect the data of the classical era in a convenient manner, I decided to approach CA as *varieties* rather than *dialects*. I selected the Qur'anic readings as a source for the classical data which is a convenient source to collect data as it presents different surface forms of the words that appear in holy text of the Qur'an.

Two subsections appear next. The first presents the modern Arabic dialects that are selected to be examined, whereas the second expounds upon the Qur'an and its Qur'anic readings.

3.5.4.2 The modern era

In terms of selecting the modern Arabic dialects for the examination, there are two restrictions that have been posited to ensure diversity. The first is the permitted types of coda in the dialects. The second is the locus of the epenthetic vowel which the dialect exhibits. Accordingly, the selected modern dialects are as follows: Iraqi Baghdadi Arabic (IBA) which does not allow complex codas even word-finally. Egyptian Cairene Arabic (ECA), which, in contrast to IBA, allows complex coda word-finally but manifests vowel epenthesis in the inflected-forms. Kuwaiti ħadar Arabic (KħA) is also proposed. This dialect belongs to the group that has three ways of realizing the –CC of the root. Hence, structurally, it is similar to the Palestinian Arabic in the primary typology. Moroccan Arabic is known for its many dialects that allow cluster sequences on the surface. I have selected Marrakesh Moroccan Arabic (MMA) to be part of the investigation.

Table 3.1 below provides examples from each of the aforementioned dialects. The example is of a CVCC root that is surfacing in its stem-form and one of its inflected-form. The underlying input appears in the first row whereas the other rows introduce the surfaced form. The underlying inputs for all the dialects are /kalb+V/ "dog.case" and /kalb+V+ha/ "her dog.case" which both are surfaced structures in SA. The gloss appears in the rows and the vowels of insert are boldfaced.

The dialect	The word without a suffix, i.e., The stem-form /kalb+V/ "dog.case"	The inflected-form The word with the suffix: 3Pers.Fem.SG. /kalb+V+haa/ "her dog.case"
IBA	[ʧa.l*i*b] "dog"	[ʧa.l*i*b-ha] "her dog"
KħA	[ʧalb] "dog"	[ʧalb-ha] "her dog"
ECA	[kalb] "dog"	[kal.b*a*-ha] "her dog"
MMA	[kilb] "dog"	[kilb-ha] "her dog"

Table 3.1: Summary of the proposed modern Arabic dialects.

The source of the modern data is informants from the aforementioned dialects. These informants are native speakers of these dialects. The detail of collecting the modern data is explained in the next chapter. Appendixes number 3, 4, 5, and 6 offer the whole set of the modern data that were collected. As for the example that appears in table 3.1, clearly all the modern data has lost case. The two dialects KħA and MMA are surfacing identical syllabic structures in terms of the type of syllables and the number of syllables in both stem-form and inflected-forms. This might deceive ones to think that the two modern dialects are alike in terms of syllabicity. However, as will be seen in chapter four there is high distinct between the two dialects in syllabification patterns though generally both display avoiding for the violation of Sonority Sequencing Principle.

3.5.4.3 The Classical era

The *Qur'anic readings* are the main source for the classical data for this study. Since these Qur'anic readings are attributed to the seventh century then the variations in the pronunciation of the holy text would reveal upon linguistic characteristics of the classical era in that specific century. In this section, I introduce the Qur'an and the Qur'anic readings for those who are unfamiliar with them.

The Qur'an presents a religious text of the Islamic faith that dates back to the seventh century C.E. For Muslims this holy text is the literal words of THE GOD ﷻ. The Qur'anic readings present different articulated productions of this holy text. The word 'production' is used here in the sense that when a person reads a text orally the articulation of the text that can be recorded is a production produced by this person. Hence, the readings of the Qur'an present the different oral productions of the holy text of the Qur'an made by persons.

The articulated productions of the Qur'an are for Muslims classified in terms of who are producing them. There are those oral articulated productions which are produced by expert Qur'anic readers and those which are produced by in-experts readers, (i.e., common Muslims). The Qur'anic readings that are produced by expert readers are what this study uses as a source for the classical data. This is because these Qur'anic readings are traced by Muslim scholarly in what can be translated to the chains of citation. In other words, there is systematic categorization made by Muslim scholarly for these readings that assess the degree of authenticity which each of these readings has. The details of this systematic categorization are not presented here due to the scope of this study. Yet, footnote 4 in chapter two shades lights more.

The source that I use to access these Qur'anic readings is a modern Qur'anic reading dictionary, (i.e., Alkhatiib 2002) which can be considered a written corpus for the Qur'anic readings. More about this Qur'anic dictionary appears in chapter four.

On the other hand, it is important to alert that Muslims' sources, (i.e., *Albukhaarii* and *Muslim*), which are among the most authentic sources of Hadith, show explicitly the existence for variant Qur'anic readings even in the Prophet's ﷺ time. Hence, the different articulations/readings for the holy text of the Qur'an were practiced since the seventh century. Furthermore, Muslims' sources provide the evidence that it is the Prophet Muhammad ﷺ who allowed the different articulation for the holy text of the Qur'an in his famous Hadith in which he stated that the Qur'an was revealed in سبعة أحرف *sabʕatu ʔaħruf* "seven letters."

The focus next is on the nature of differences between the Qur'anic readings. However, I start first by pointing out that through my experience with Alkhatiib's dictionary (2002), I noticed that terminologically, the differences between the Qur'anic readings are distinguished by the Muslim scholarship through two terms لغة *lugah* "language" and the

term قراءة *Qiraaʔah*[14] "reading". Generally, my conclusion was that the first refers to dialectal differences, whereas the second refers to non-dialectal differences.

In the following paragraphs, I present examples of differences categorized within a suggested taxonomy of three classes utilizing WL terminologies. Two of them are adopted from Bohas, Guillaume & Kouloughli (1990/2006). From a linguistic perspective, the two terms of Bohas, Guillaume & Kouloughli (1990/2006, p.2) seem sufficient in capturing the essence and nature of specific forms of differences that are observed between the Qur'anic readings. These terminologies are 'the morpho-phonological and morpho-syntactical levels'. I add another class that is the phonetic-phonological level, and contrary to Bohas, Guillaume & Kouloughli (1990/2006), an example is provided for each class. Before discussing the differences, it should be emphasized that, descriptively, the readings as a whole correspond to each other, letter by letter, more than they differ. Whilst, in general, this issue is well realized in the works of the Muslim scholarship, notably the research of the Arabcists scholarship is representing it in a misleading way that makes it unclear. Italic headings are used to indicate to the differences based on the linguistic level they are classified within.

The morpho-phonological level

Occasionally, the readings may divide over a word form that appears in the holy text in terms of specific morphological features, (e.g., Number). This is an example for such type of differences. The noun بَرْق *barq* "lighting" appears in five positions in the holy text of the Qur'an based on (http://corpus.quran.com). Upon searching these positions in Alkhatiib's (2002) Qur'anic readings dictionary all the readings produce the same form except in one of these positions. In that position, (i.e., the verse 43 in Chapter ʔan-Nuur 24), I found that there are two oral productions for برق. It was noticed that there are readings that articulates this noun in its singular form, (i.e., بَرْقِهِ [b**a**rq-i-hi] "his lightings") whereas other produce it in its plural form, (i.e., بُرُقِهِ [b**uru**q-i-hi] "his lightings"). Producing it in its singular form is قراءة الجمهور *QiraaʔatAl-Jmhuur* "the reading of the majority." Hence, the singular reading for the noun برق is realized in most Qur'anic readings. Observe that that letters are the same and that the difference is mainly in the diacritics.

The morpho-syntactical level

An example that I found for this type of differences is in voice, (i.e., being active or passive) appears in (13) below. Upon checking Alkhatiib's dictionary (2002), it was noticed

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[14] Note that the term here is a homophone, whereas here it refers to the non-dialectal differences in the readings/articulations, in other context it refers to the Qur'anic readings themselves. Thus, it is a term that names a thing, (i.e., productions of the holy text) and it is used as a descriptive tool that describes non-dialectal differences between these productions.

that a specific subordinate clause in verse (42) of Chapter ʔal-ʔaʕraaf (7) is read with three different articulations. Two of these articulations are in the active voice whereas the third is in the passive voice. This example is presented through the following organization; the Arabic holy text, suggested translations and glosses for each articulation. Observe that the Arabic holy text is transcribed in Arabic based on حفص عن عاصم the Hafsˤ ʕan ʕaasˤim Qur'anic reading form, the most practiced reading form in the Islamic world. Thus, the diacritics that appear are based on this reading/articulation. The Arabic transcriptions of the other two articulations are: لا نُكَلَّفُ نَفْسٌ and لا يُكَلِّفُ نَفْسًا , the overt differences between the transcriptions put the distinction between the articulations in the diacritics not the letters. Yet, the distinction causes as will be explained morpho-syntactic difference and affects the meaning. This part is ended with corrections for some inaccuracies appear in the translations. In the Arabic holy text and the translations the clause of interest is underlined. THE GOD ﷻ says:

﴿وَالَّذينَ آمَنوا وَعَمِلُوا الصّالِحاتِ <u>لا نُكَلِّفُ نَفْسًا</u> إِلّا وُسعَها أُولئكَ أَصحابُ الجَنَّةِ هُم فيها خالِدونَ ﴿٤٢﴾﴾

The suggested translations for this verse are:

Saheeh international (2013: 140) '42. But those who believed and did righteous deeds <u>We charge no soul except</u> [within] its capacity. Those are companions of Paradise; they will abide therein eternally.'

'Alī (2001:355) '42. ℬut those who believe And work righteousness – <u>No burden do We place On any soul</u>, but that Which it can bear – They will be Companions Of the Garden, therein To dwell (forever).'

Pickthall (2006: 167) '42. But (as for) those who believe and do good works–<u>We tax not any soul</u> beyond its scope– Such are rightful owners of the Garden. They abide therein.'

On the other hand linguistically the elements in the underlined Arabic holy text are read in the Qur'anic readings as either:

13a. Laa **n**u-kall**if**-u   nafs-**a-n** ʔilla   wusʕ-a-haa
   No   WE.burden.Present   self.Acc   except   capacity.Acc.its
      "WE do not burden a self except what it has capacity for"

13b. Laa **t**u-kall**af**-u   nafs-**u-n** ʔilla   wusʕ-a-haa
   No   passive.burdened.Present   self.Nom   except   capacity.Acc.its
      "No self is burdened except what it has capacity for"

13c. Laa **ju**-kall**i**f-u   nafs-**a**-n   ʔilla   wusʕ-a-haa
    No   HE.burden.Present   self.Acc   except   capacity.Acc.its
       "HE does not burden a self except what it has capacity for"

Descriptively, the discussed subordinate clause in the verse is itself a construction of two clauses. This construction is termed in ALT with الاستثناء which Ryding (2005: 650) translates as 'exceptive expressions'. It is formed by joining two clauses by exceptive words. In the discussed construction the exceptive word is [ʔilla]. Nonetheless, the morpho-syntactic difference in the voice occurs in the main clause. It results due to the boldfaced three segmental realizations that appear on the verb and the noun. As can be seen, close yet distinctive meanings are constructed due to the difference in voice. Such type of difference between the Qur'anic readings is already recognized by Muslim scholarly (see: Alkhatiib's dictionary, 2002, vol. 11: 18-19). The unique about this type of differences is that such close yet still distinctive meanings appear to be part of a whole meaning. Each distinctive meaning appears to be functioning as a *sub-unit* in a unification that houses a *whole* fixed meaning. From the morpho-syntactical perspective, we can describe the difference in voice which appears in the Qur'anic readings as following:

Whether the voice in the clause is active or passive is because of mainly three segments surfacing in the three articulations. These segments are consonants attached to the verb, (i.e., /n/ in the first reading, [t] in the second reading and [j] in the third reading). They all appear the verb-initial. The [n] and [j] are responsible for the active voice in the first and the third readings as they are a component of the prefixes 1Pers Plural [nu-] "we" and 3Pers Sing [ju-] "he". These two pronominal prefixes are both referring to THE GOD ﷻ, hence, I capitalized the pronouns in my suggested translations. The passive reading in (13b) surfaces [t] instead of the previous two consonant segments; hence, realizing as [tu-]. This prefix marks passive voice and displays agreement in the feminine gender as well. Characteristically, the Arabic language is among those languages, which their words can be classified in terms of gender to masculine and feminine, (e.g., French and Welsh). The verb through the prefix [tu-] is displaying gender agreement with its grammatical subject, that is, the Arabic noun [nafs] "self". The vocalic segment in the verb that appears after the lateral geminate is a component of the affix that marks voice in all the examples in (13). In the verb, the back [-a-] marks the passive voice whereas the front vowel [-i-] marks the active voice. Therefore, the readings in (13a) and (13c) are surfacing the front vowel whereas the reading in (13b) is surfacing the back vowel. The three articulations differ as well in a vocalic segment that is attached to the noun [nafs] functioning as a case suffix. Notably, both active

voice readings surface the accusative vocalic [-a] whereas the passive voice reading surfaces the nominative vocalic [-u]. Since the noun is indefinite in the three articulations all surface the nasal [-n] after the case marker.

Therefore, descriptively, the active readings for the clause are distinct mainly in one segment, that is, the consonant that surfaces verb-initially. However, the passive reading differs from the two active readings in three segments.

As for the *sub-units* of the *whole* meaning that each articulated reading is functioning:

The first articulated reading in (13a) is a declaration: THE GOD ﷻ declares that "WE" do not burden a self <u>except</u> what it has capacity for.

The second articulated reading in (13b) is informative: It is informing that no self is burdened <u>except</u> what it has capacity for.

The third articulated reading in (13c) is informative: It is informing that HE ﷻ does not burden a self <u>except</u> what it has capacity for.

Clearly, the main clause in the exceptive construction is a negative clause. It is in this negative clause the differences in the articulations appear as have been illustrated above. The second clause which means "except what it has capacity for" is articulated the same without any difference. Therefore, based on the aforementioned sub-units of meanings, the whole meaning that is perceived is:

> A self is not burden except with what it has capacity for as THE GOD ﷻ does not burden a self more than the capacity that this self has. This should be believed as a fact because THE GOD ﷻ, who created every self in the worlds, is informing that a self has a capacity, and declaring that HE does not burden a self more than the capacity it has.

In other words, the whole meaning informs what a person should know about THE GOD ﷻ in terms of what HE gives a self and puts this self through and in terms what this self is capable to do. In this life what a self is given and put through are because this self has a capacity for them. In addition, it informs what a person should know about a self, including his/herself, (i.e., this self is created with a capacity). It also seems to be holding an implicit commend, that is, since THE CREATER[15] ﷻ who created this self does not burden it more than its capacity then a person should watch him/herself not to exceed this capacity or low estimate it whether with the capacity of own-self or of others' selves. This commend appears explicitly in other positions in the Qur'an, (e.g., verse 195 in Chapter ʔal-Baqarah 2) and some Hadiths of the Prophet ﷺ.

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[15] Muslims believes that THE GOD ﷻ has holy names. This is one of them.

On the other hand, contrasting the three translations with the Arabic holy text reveals on linguistic inaccuracies that are made in these translations. The following modifications are given to clarify the inaccuracies and correct them.

i.   The past tense of the verbs 'believed' and 'did' in Saheeh's translation is compatible with the overt past tense that appears in the coordination construction in the verse. However, the tense in Arabic is complex and the role of the context is of importance to perceive the intended tense. Therefore, in contrast to Saheeh's translation, what is perceived in the Arabic holy text is the continual/constant tense; hence, to give the perceived tense the verbs *believe* and *work* in the translation should be continuous.

ii. Lexically, the Arabic verb عمل is compatible with the English verb *worked* not *did*.

iii. The meanings that appear from the translations 'righteous deeds', 'righteousness' and 'good works' as translation for the plural word الصالحات are correct. Yet, this Arabic word has also the lexical meaning of "purified". Hence, the perceived meaning from the Arabic holy text is the purified 'righteous deeds', the purified 'righteousness' and the purified 'good works'. The purifying of a good work means that the good work was done with the hope of getting reworded from mainly THE GOD ﷻ. For instance, paying a charity <u>in secrete</u> is a way of purifying this good deed from الرياء "the showing off" which is among the diseases of hearts. A human should pay a charity pleading for the acceptances from THE GOD ﷻ who commends humans to have mercy and compassion towards each other and to make the efforts that express this mercy and compassion. Therefore, the reword from THE GOD ﷻ is because of HIS acceptance for the good work. The knowledge of THE GOD ﷻ is unlimited and is known that it encompasses everything including humans' intentions.

iv. The word *burden* is thought more compatible to the meaning of the *base* of the Arabic verb نكلف [nukallif].

v.   Translating the Arabic word الجنة [ʔal-ʒannah] with the word 'Paradise' is incorrect. The 'Paradise' is pronounced in Arabic as [ʔal-firdaws]. As far as the search engine of (http://corpus.quran.com), the word [ʔal-firdaws] appears in the Qur'an twice inflected in one verse with the genitive marker (verse 107 in Chapter 18), and in the other with the accusative (verse 11 in Chapter 23). In a strong cited Hadith, the Prophet ﷺ instructed the Muslims to specifically ask THE GOD ﷻ to

be reworded with the Paradise. He ﷺ informs that it is the highest place in The Heaven and that the rivers of The Heaven gush from it. I also do not think that the word 'the Garden' is a correct translation for الجنة . I perceive this English word as الحديقة which can be found in the holy text of the Qur'an as far as Qur'an corpus search engine three times in its plural form, (e.g., verse (32) in Chapter 78 ʔan-Naba?). I think that the correct English translation for الجنة is The Heaven, because my impression is that 'the Garden' or 'the Gardens" are limited in the size. This contrasts with The Heaven. Nonetheless, the words in the holy text are employed terminologically, thus, translations need to make more carefulness for this characteristic of the Qur'an.

vi.   Lexically, it is correct to translate the Arabic word أصحاب as 'companions' and as 'owners'. Consequently, the phrase أصحاب الجنة is perceived as "the owners of The Heaven" and "those who company each other as a group to The Heaven". Therefore, the whole meaning would be that those who believe and work the purified good works company each other as a group to The Heaven which they owned". These two meanings are expressed separately with more focus in other verses in the Qur'an. For example, verse (69) in Chapter ʔan-Nisaa? (4) focuses on the meaning of the company whereas the long verse (111) in Chapter ʔat-Tawbah (9) is explicit on the meaning of owning The Heaven.

vii.   Pickthall's adjective 'rightful' in 'rightful owners' is an addition that does not appear in the discussed verse. Yet, it is expressed in other verses in the Arabic holy text, (e.g., verse 37 in Chapter 34 Saba?).

viii. The Arabic word أولئك is a determiner not a pronoun; hence, the correct translation is 'Those' not 'They'.

ix.   The translations that are suggested for the last sentence in the discussed verse display inaccuracies. The future tense which appears in Saheeh and Alī's translations does not exist in the Arabic holy text. As for Pickthall's translation it misses the eternity of living in The Heaven. Thus, instead I suggest these translations "Those are companions of The Heaven they abide in it eternals/immortals" and "Those are the owners of The Heaven they abide in it eternals/immortals". Note, in contrast to Saheeh and Alī's translations, I suggest the adjectives "eternal/immortal" because the word that appears in the holy text, (i.e., خالدون) describes أولئك "Those" as "immortal/eternal people" who abide "in The Heaven". Thus, the perceived meaning in the discussed verse is that the

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reword is not about living eternally in The Heaven. Rather, it is being immortal in The Heaven.

The phonetic-phonological level

An example for this type of differences is the articulation of the word الضحى "Forenoon" which appears in verse (1) in Chapter ʔadˁ-dˁuħaa (93). This word has three realizations in the Qur'anic readings according to Alkhatiib (2002, vol. 10: 477). The first realization is with the long phonemic /aa/, hence, [dˁuhaa]. The second is with the allophone /ee/, hence, [dˁuhee]. The allophone was introduced in chapter one when discussing *ʔal-ʔimaalah* process. As far as Alkhatiib (2002, vol. 10: 477), there is a third realization that surfaces with التقليل *ʔat-taqliil* "the decreasing". I do not know what does this term refers to conceptually nor is it introduced by Alkhatiib (2002)[16]. However, considering the structure of the word الضحى, the lexical meaning of the term *ʔat-taqliil* and the names of the expert readers whom Alkhatiib is attributing for this third realization, I think the third realization involves reducing the length of the final vowel of both [dˁuhaa] and [dˁuhee].

The aforementioned examples not only highlight the richness of the linguistic details that can be obtained through studying the oral productions of the Qur'an, the oldest complete Arabic text, but they also display how important they are as a source for diachronic studies that are interested with change in the Arabic language, in particular, and change in languages in general.

The method of collecting the data from Alkhatiib's (2002) dictionary of the Qur'anic readings is explained in chapter four.

3.5.6 The compared type of nominal words

Systemizing the investigation of the research requires reducing the width of the scope. Accordingly, several reductions in the investigation have been conducted. The first is that mainly nominal words are the focus of this research even though the hypothesis of this study has the thesis that *the evolution of CVCC syllable type in Arabic is due to the loss of* إعراب *ʔiʕraab*. This is reintroduced within WL as, *the evolution of the superheavy CVCC in Arabic is due to the loss of the mode and case vocalic inflections*.

The justification behind broadening the scope of the main hypothesis even though I design an investigation that narrows this scope appears in the literature of Arabic phonology. Notably, the most well-known example in the phonological literature of Arabic about the

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[16] Bear in mind that I checked for the information only vol. 10: 477 and vol.11 because these are the only two positions that I expected that Alkhatiib would give an illustration or definition of the term/word.

modern epenthetic vowels that is under investigation is of an epenthetic vowel that appears in a verbal word not nominal (see Itô, 1989; Kiparsky, 2003 & Watson, 2007 among others). This example is 'I told him' [gil*i*tla], [giltla] and [gilt*i*la] as transcribed in Watson (2007).[17] Diachronically, these modern dialectal variations of this verbal word are interesting. Because no diachronic interpretation that explains these synchronic variations of this highly discussed verbal word was found, I give one in the next paragraph.

From a diachronic perspective, the synchronic variations *gilitla≈giltila≈giltla* developed from the attested classical phrase: *qultu lahu* "I told him". Analytically, I argue that the two different words in the classical era: "I told" /qul-t*u*/ and "to him" /la-hu/ due to phonological reduction became one word. By combining other subject pronominal suffixes to the verbal word in the phrase we will have the following attested classical phrases:

14a. qul-t*a* la-hu   'told. you.Masc him'
14b. qul-t*i*   la-hu   'told. you.Fem him'

Note that the italic morpho-syntactical vowels in (14) are in the same locus of what is introduced as epenthetic in the modern surfaced realization [gil.t*i*-la]. Observe as well that the epenthetic vowel in both [gi.l*i*t-la] and [gil.t*i*-la] is breaking up the consonant cluster which is the same phonological function of the morpho-syntactical vowels in (14). Therefore, in contrast to the modern Arabic dialects, which surface the form [gilt-la], the dialects that surface the forms [gi.l*i*t-la] and [gil.t*i*-la] are resisting the innovation of CVCC syllable type in the verbal words. Thus, the resistance for CVCC syllable type and its evolution is not restricted to nominal words. However, the verbal words are left out in this research because the focus of the investigation is essentially concerned with the loss of case inflections not verbal inflections.

The current theoretical treatment for Arabic phonology does not exhibit caution when proposing theoretical accounts for verbal and nominal data (see the typology of Kiparsky 2003 and Watson 2007 for example). This shows that phonologists have a presupposition that in Arabic there is typical noun-verb symmetry. This study does not have this presupposition; rather, high attentiveness is paid for the categorization of the data. This high attentiveness is because even though there are observable analogical similarities between verbs and nouns in Arabic; however, differences between them are observed as well. In fact, unless paying caution generalizations might be formed as overgeneralizations even in the class of nominal

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[17] Watson (2007: 337) transcribes as well [gilitila], however, I think this transcription is wrong considering the transcription that appears in the preceding page in her paper.

or verbal stem that is being investigated. Therefore, the examination in this study is designed to test a specific type/class of nominal words only that is nouns and only singular monosyllabic nouns. Hence, other restraints that ensure more consistency and focus are implemented.

Expounding upon the restrictions, the examination centres on the singular monosyllabic heavy stems that comprises of CVCC underlying sequence and their paradigms. Worth mentioning, I have been enlightened with this type/class of nominal words because of my knowledge of the morphological theory known as الميزان الصرف *Al-miizaanu Al-sˤsˤarfiy* "The Morphological Scale" (TMS, henceforth), which is one of the main theories of ALT in the sub-field of study that is known as علم الصرف "Morphology".

The TMS is concerned with measuring the word structures of Arabic. According to old grammarians' views there are singular monosyllabic heavy stems فَعْل CaCC, فُعْل CuCC, and فِعْل CiCC which are usually identified as الاسم المجرد الثلاثي *Al-ismu Al-mujarradu Al-thulaathii*. Theoretically, these are viewed as the *smallest* trilateral nominal unites (see: Alkhatiib 2003 for a detailed illustration and a historical background for this theory).

For each of these three forms, 20 stems have been selected to be examined in this study. The aim is to find out the synchronic variation(s) for each stem-form and its inflected-forms. Hence, discover the development morpho-phonological realizations of them. Such discovery gives the opportunity to assess the directions of change in Arabic from a morpho-phonological perspective.

Accordingly, it is anticipated that the total amount of stems that will be obtained from each investigated modern Arabic dialect is 60 stems. Conversely, the total amount of inflected-stems depends on the number of pronominal suffixes that exist within the morphological inflections of the specified investigated dialect. To explain, IBA and ECA are two investigated modern Arabic dialects in this study as has been mentioned before. It is noted that whereas IBA still preserve the plural feminine third person suffix in addition to the plural masculine third person suffix, the other dialects have this gender distinction in both the 3Pers.plural and 2Pers.plural. Thus, the paradigms in IBA are more than the other dialects. In contrast, the data of MMA is the less because it has lost the gender distinction in the 2Pers singular in contrast to the other dialects.

In chapter four the phonological criteria that determined the selection of the 60 monosyllabic heavy stems CVCC are displayed.

3.5.7 The Optimality Theory as a framework

The framework which this study is using to approach the phonological structures of the nominal words is OT. There are several reasons that justify applying this framework in this study. However, only the straightforward reasons are given here. The first reason is related to the fact that most recent research that approached the syllable structures of the Arabic language has proposed theoretical accounts for related phenomena through one of OT's versions (e.g. Mester & Padgett, 1994; Zawaydeh, 2003; Kager, 1999; Kiparsky, 2003; Watson, 2007; Elfner, 2009; McCarthy 2011).

The second is related to the framework of the OT theory itself. In that, the mechanisms that it offers to express generalizations are instrumentally useful to represent a cross-variations comparison, which is a target in this study. Therefore, chapter five, which is focused in developing a theoretical account that captures the morpho-phonological generalizations that are concluded in this study, proposes hierarchies within levels for the modern dialects and the classical variations of the Arabic language. Therefore, the OT version that is employed in this study is stratal OT.

3.6 Conclusion

To sum up, this chapter introduced the thesis of the hypothesis that is assumed in its two scopes. It informed that only part of this thesis is tested in this study. This part assumes that the loss of the case endings has led to the emergence of an epenthesis process in the Arabic language. The rationale behind the tested part of the hypothesis was explained. It was found that the literature gives substantiations that attest the tested thesis. These substantiations are the discovery of other phonological processes, (i.e., case metathesis and glide vocalization) that contribute towards surfacing a structure that prevents syllabic complexity. In addition, it was discovered that the CVCC syllable type still faces in the modern era resistance. On the other hand, this chapter discusses the general lines of the examination that is designed to test the hypothesis and obtain the results. These general lines include: defining the term Classical Arabic, introducing the sources of data and specifying the framework that is used to analyse the data.

Chapter 4
The data
What does the data say?

4.1 Introduction

This chapter is concerned with explaining firstly the methodology of collecting the data of both eras, (i.e., the classical and the modern). Secondly, it is concerned with discussing the results that were obtained from the data. The main goals of this chapter are to elicit conclusions from the observations that are found in the data and to make generalizations which the analysis of chapter five will account for.

This chapter is organized as following. The subsequent section introduces a detailed explanation of how the search was conducted to obtain the data of both eras. This includes an outline of the phonological and non-phonological criteria that were implemented as bases for the selection of the investigated 60 monosyllabic stems. Moreover, it includes an explanation of how the classical data was obtained from Alkhatiib's (2002) dictionary. Furthermore, the process of obtaining the modern data from native informants is also outlined. The third section presents a discussion for the main results which ends with making two generalizations that were concluded from the collected data. The first is regarding the state of the novel syllable type CVCC in the investigated modern Arabic dialect, whereas the second is about the moraic weight of the investigated type of words in both forms, (i.e., the stem-form and the inflected-form). The last section in this chapter summarizes the core issues that were concluded in this chapter.

4.2 The methodology of collecting the data

As said in the previous chapter, an examination was designed to collect and analyse the data to test the hypothesis of this study and to discover the state of CVCC syllable type in both eras; (i.e., the classical and modern). This examination comprised of selecting 60 CVCC nominal stems in order to investigate their structures in both eras. Secondly, by utilizing Alkhatiib's (2002) dictionary of the Qur'anic readings, the structure(s) for each of these 60 stems and their paradigms were obtained with the assumption that they represent the variations of the classical era for these nominal words. This step is explained in detail in 4.4.2. Following this, the collection of the modern data is outlined in 4.4.3. However, before illustrating the producers that were made to collect the data the subsection 4.2.1 is presented to illustrate the criteria behind the selection of the 60 stems.

4.2.1 The criteria behind the selection of the investigated stems

The criteria are divided into phonological and non-phonological. Starting with the non-phonological criteria, these 60 stems have been first determined on examining the nominal words which the holy text of the Qur'an contains. Utilizing the edition of the Qur'an that is based on حفص عن عاصم the Hafsˤ ˤan ˤaasˤim Qur'anic reading form, I looked for the three underlying stems فَعْل CaCC-V, فُعْل CuCC-V and فِعْل CiCC-V. Generally, I concluded that the holy text of the Qur'an has CaCC-V stems more than CuCC-V and CiCC-V stems [1]. During this step, I was tracing the CVCC in the holy text without considering the form they surface in, (i.e., whether they were bases for a stem-form or bases for inflected-forms). Therefore, the collected data consists of (i) CVCC roots surface in the holy text in their stem-forms and inflected-forms, (ii) CVCC roots surface in the holy text only in their stem-forms and (iii) CVCC roots surface in the holy text only in their inflected-forms. I did not restrict the collection of the classical data with a condition that restrains the collected data to those that have both stem-forms and inflected-forms. This is done to ensure the width of the collected data. To explain, there is an important restrain that controlled the selection of what are found of roots. This is that all the selected roots are supposed to be part of the vocabulary of the investigated modern Arabic dialects, (i.e., IBA, KħA, ECA and MMA) and not borrowed from MSA. Thus, since I am restrained with what the holy text of the Qur'an contains of words I had to overlook the surface-forms which a CVCC root exists in the holy text. Otherwise, the amount of collected data would have been reduced to less than 60 stems.

Thus, after collecting the stems from the holy text, they were displayed to a native speaker of each investigated dialect to consult him/her whether they are part of the dialect's vocabulary. This consult step was expected to reduce the amount of stems which were collected from the holy text. Therefore, intentionally I collected in the early stage of my search for the 60 stems all what were found of CVCC stems in the holy text. This step of collection was manual. As was expected, consulting a native speaker of each investigated dialect reduced the first amount of collected stems. The collected stems were then sifted with the aim of making sure that I select only the active stems in terms of their usage in the modern investigated dialects. The final selection of the stems, which are introduced in the tables 4.1a, 4.1b and 4.1c below, went through another filter that is the phonological criteria.

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[1] Worth mentioning, even though Hamid (1984) formed his corpus of CVCC roots using sources that differ from the sources that are used in this study but he also observed that CaCC roots are more than the CuCC and CiCC roots.

The phonological criteria were motivating the diversity as much as possible. The first criterion that controlled the selection is that the three types of CVCC roots, (i.e., CaCC, CuCC and CiCC) should be tested equally in terms of the amount. Thus, I controlled the type and the amount. Each of CVCC roots type has to be 20. The 20 roots can be seen is table 4.1a, table 4.1b and table 4.1c below. Recall that the forms of SA are used as inputs for all the dialects and variations.

Secondly, multiplicity in terms of the types of consonants that forms the structures of roots, whether glide, liquids, nasals, fricatives, affricates or stops was also considered. This multiplicity can be seen in the column *the standard structure* in the aforementioned tables. The motive for creating this multiplicity is to test whether there are any relationships between the type of consonants and the change in the syllable structure.

To explain, the glottal stop is a consonant that needs to be considered with some caution considering its state in the classical era and the modern era. For example, in contrast to the standardized form for the word "head.Nom.her" is [raʔs-u-haa] the Arabic vernaculars, as far as I know; do not surface the glottal stop of the root. The 'YaafiʻI', a Yemen dialect, surfaces [raas-haa] according to Watson (2007). As a native speaker of KħA dialect, I can confirm that this Yamani's realization of this word is the same realization of KħA. Hence, the glottal stop is also substituted with the long /aa/ in KħA in the surface-forms of this word. Thus, the selection of the data in the early stage considered this observed difference by ensuring that the data examined consists of CVʔC and CVCʔ roots. Clearly, the deletion of the glottal stop and the lengthening of the vowel /a/ contribute in avoiding the CVCC syllable type. In addition, notably the two processes contribute to the realization of another syllable type CVVC which is also known to be restricted in SA and CA to pausal position.

Accordingly, there is good evidence to assume that there is a relationship between the realization of underlying consonants and the occurrence of the vowel epenthesis process in modern Arabic. Furthermore, there is evidence that some strategies may be restricted to avoid specific sequences in a language. For instance, in Welsh, Hannahs (2013:91-92) notes that metathesis as a repair strategy is restricted for a small data in which the sequence /-θr/ is prevented from surfacing in codas. He points out that this repair strategy is favoured over epenthesis and deletion which are the more observed types of resolution for the cases that have the potential of violating the sonority sequencing in Welsh. These observations of Hannahs (2013) about the Welsh words with final /-θr/ appear to be similar to those of Arabic words that ends underlyingly with final GC and CG as seen in Hamid (1984) and the above mentioned ʔC, Cʕ. Bearing these in mind, the underlying consonants of the 60 roots were an

important criterion that was implemented to form diversity that was expected to enhance the examination with more insight in relation to the surfaces that are witnessed in the modern Arabic dialects.

I also included an example of CVC_iC_i root in the selected data. The significance of such syllable can be observed from the following monosyllabic stem /dubb/ "bear" which has an underlying geminate:

(1a) [dubb-u-n]   " the contextual form: bear.Nom.Indef"
(1b) [dub]   "the pausal form of Nom and Gen: bear.Indef"
(1c) [dubb-aa]   "the pausal form of Acc: bear.Indef"
(1d) [dubb-ii]   "1Pers.Sing bear"[2]
(1e) [dubb-u-naa]   "1Pers.Plur. bear.Nom"
(1f) [dubb-u-ka]   "2Pers.Sing.Masc. bear.Nom"
(1g) [dubb-u-ki]   "2Pers.Sing.Fem. bear.Nom"
(1h) [dubb-u-kumaa]   "2Pers.dual. bear.Nom"
(1i) [dubb-u-kum]   "2Pers.Plur.Masc. bear.Nom"
(1j) [dubb-u-kunna]   "2Pers.Plur. bear.Nom"
(1k) [dubb-u-hu]   "3Pers.Sing.Masc bear.Nom"
(1l) [dubb-u-haa]   "3Pers.Sing.Fem. bear.Nom"
(1m) [dubb-u-humaa]   "3Pers.dual. bear.Nom"
(1n) [dubb-u-hum]   "3Pers.Plur.Masc. bear.Nom"
(1o) [dubb-u-hunna]   "3Pers.Plur.Fem bear.Nom"

Obviously, the formation of the indefinite pausal form of nominative leads to the deletion of not only the suffixes but also the final geminate consonant only in example 1b. This deletion for the final geminate is not limited to the indefinite nominative pausal form. Nonetheless, an example of such type of words is part of the data examined in this study. This examined word is "evil" which has the underlying string /ʃarr/ according to TMS and appears in 18 in table 4.1a.

The last criterion is the Sonority Sequencing Principle (SSP) which was also considered when selecting the stems. This was done to investigate the relationship between SSP and the occurrences of the epenthesis process. The SSP principle states that the sonority peak is the syllable nucleus whereas the segments that appear in syllable edges are lower in relation to their sonority. Furthermore, it holds that the effects of SSP also appear in the consonant clusters in the edges; hence, typically the closer a consonant is to a nucleus the more sonorous it is.

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[2] Observe that all the pronominal possessive suffixes of SA are consonant-initial except [-ii] 1Pers.Sing. When a noun is inflected with this suffix the vocalic case marker does not surface as can be seen from (1d).

The importance of the consideration of SSP is evident in the word "prison" which appears in 18 in the table 4.1c. This word has the structure [siʒn-V] in SA. The voiced fricative /ʒ/ is less sonorant than the followed consonant, which is the nasal /n/. Deleting the case marker V; therefore, causes the realization of the complex coda /ʒn/ which has the potential of violating SSP. Thus, this potential of violation for SSP anticipates the implementation of a repair strategy. Therefore, phonology is expected to operate the vowel insertion here to avoid the violation. In the tables 4.1a, 4.1b and 4.1c, the stems that are expected to show an insertion of vowel epenthesis in the modern Arabic varieties to avoid SSP violation are boldfaced.

Table 4.1a comprises the roots that have the underlying sequence of CaCC. As can be seen, the boldfaced stem-forms are those that have the potential to violate SSP when deleting the vocalic marker (V). These represent 30% of CaCC data.

Number	Word	Standard Structure
1	نفس "Self"	[nafs-V]
2	وعد "Promise"	[waʕd-V]
3	**شهر "Month"**	**[ʃahr-V]**
4	سبت "Saturday"	[sabt-V]
5	برق "Lightning"	[barq-V]
6	**بحر "Sea"**	**[baħr-V]**
7	زوج "Spouse"	[zawʒ-V]
8	وجه "Face"	[waʒh-V]
9	**غلي "Boiling"**	**[ɣalj-V]**
10	زرع "Crop"	[zarʕ-V]
11	حرف "Edge"	[ħarf-V]
12	رعد "Thunder"	[raʕd-V]
13	كلب "Dog"	[kalb-V]
14	**لحم "Meat"**	**[laħm-V]**
15	**فضل "Bounty"**	**[fadˤl-V]**
16	**رأس "Head"**	**[raʔs-V]**
17	قلب "Heart"	[qalb-V]
18	شر "Evil"	[ʃarr-V]
19	شيء "Thing"	[ʃajʔ-V]
20	أرض "Earth"	[ʔardˤ-V]

Table 4.1a: The standard structures of words with CaCC underlying root sequence

Table 4.1b presents the stem-forms of CuCC roots. The boldfaced of these stem-forms represent 55% and these are the ones that are expected to surface consonant clusters that violate SSP if V is deleted.

number	word	Standard Structure
1	أخت "Sister"	[ʔuxt-V]
2	جزء "Part"	[ʒuzʔ-V]
3	ملك "Dominion"	[mulk-V]
4	**بخل "Stinginess"**	**[buxl-V]**
5	**ركن "Nook"**	**[rukn-V]**
6	**كفر "Disbelief"**	**[kufr-V]**
7	ظلم "Injustice"	[ðˤulm-V]
8	**شكر "Gratitude"**	**[ʃukr-V]**
9	كره "Hate"	[kurh-V]
10	عرف "Custom"	[ʕurf-V]
11	رعب "Fright"	[ruʕb-V]
12	**دهن "Fat"**	**[duhn-V]**
13	**صبح "Morning"**	**[sˤubh-V]**
14	**حكم "Judgment"**	**[ħukm-V]**
15	**عذر "Excuse"**	**[ʕuðr-V]**
16	صلح "Reconciliation"	[sˤulħ-V]
17	**وسع "Capability"**	**[wusʕ-V]**
18	**حزن "Grief"**	**[ħuzn-V]**
19	صنع "Work"	[sˤunʕ-V]
20	**حسن "Beauty"**	**[ħusn-V]**

Table 4.1b: The standard structures of words with CuCC underlying root sequence

Lastly, the 20 stem-forms identified in table 4.1c have the underlying sequence of CiCC as a root. Additionally, 50% of this data are expected to surface with a complex coda that has the potential to violate SSP if V is deleted.

Number	Word	Standard Structure
1	ضعف "Double"	[dˤiʕf-V]
2	صدق "Truth"	[sˤidq-V]
3	جذع "Trunk"	[ʒiðʕ-V]
4	حزب "Party"	[ħizb-V]
5	مسك "Muskiness"	[misk-V]
6	**بئر "Well"**	**[biʔr-V]**
7	**ذئب "Wolf"**	**[ðiʔb-V]**
8	**إذن "Permission"**	**[ʔiðn-V]**
9	قسط "Justice"	[qistˤ-V]
10	**عجل "Calf"**	**[ʕiʒl-V]**
11	علم "Knowledge"	[ʕilm-V]
12	**فعل "Action"**	**[fiʕl-V]**
13	ملح "Salt"	[milħ-V]
14	رزق "Provision"	[rizq-V]
15	**سحر "Magic"**	**[siħr-V]**
16	**رجل "Leg"**	**[riʒl-V]**
17	**كبر "Greatness"**	**[kibr-V]**
18	**سجن "Prison"**	**[siʒn-V]**
19	**شعر "Poetry"**	**[ʃiʕr-V]**
20	دفء "Warmth"	[difʔ-V]

Table 4.1c: The standard structures of words with CiCC underlying root sequence

4.2.2 The collection of the classical data

After selecting the 60 stems based on the aforementioned criteria, a search was initiated to find out the times of occurrence of each root in the Qur'an. These times of occurrences are counted by counting both the stem-form and the inflected-forms of each of the 60 nominal stems. In addition, it was done to find out the positions of occurrence in the Chapters and verses. This part of search was done electronically using two electronic search engines of the holy text of the Qur'an. The first belongs to the website: http://www.searchtruth.com, whereas the second is the search engine of http://www.corpus.quran.com. The procedures that were conducted when using the search engine of the two websites are explained next starting with the first website and then moving to the second.

Amongst its conveniences, (e.g., different language translations of the Qur'an, Hijri-Gregorian date converter and learning Arabic), searchtruth offers an effective means to electronically search for any word in the Qur'an. The search within the search engine of this website often counted and located all the nominal and verbal forms of the underlying sequence of each of the 60 stems. In other words, it referred me to the exact location of not only the searched nominal stems and their paradigms, but also to other derivations that belong to the same word-family. Thus, to precise the amount of data to what this research is concerned with, a manual search for the amount of data of each of the 60 stems was conducted. Thus, I looked to all the verses which the website located for a searched stem to precise only those that match the required forms, (i.e., singular nominal with the underlying sequence of CaCC-V, CuCC-V and CiCC-V and their inflected-forms). Also, it was noticed that the search engine for some stems did not locate me to all the positions that I know that the stem appears in. Thus, the shortages in the search engine were overcome by my knowledge.

For example, in the process of searching the nominal word "month" /ʃahr/ in the holy text, I utilized the Arabic orthography system and wrote the word as: شهر in the website search engine. The electronic search resulted in 17 occurrences in the text of the Qur'an. These 17 occurrences were then manually searched and tested in terms of corresponding to what I know about the positions of this stem in the Qur'an. The final result ended with only 12 occurrences that matched the required forms. Thus, the remained occurrences were disregarded on the bases that they do not match the word-form investigated. Notably, the disregarded occurrences are either the duel forms or plural forms of the word "month".

Another note about this word is that it does not appear in the holy text in any inflected-form. The number of occurrences and the position of occurrences of each stem are documented in the second and third columns in the tables that appear in appendix 2.

As said, the search is for both the stem-form and inflected-forms of each of the 60 stems. The stem-forms are singular nominal that appear in the holy text without being inflected with a pronominal suffix. Accordingly, if any of the 60 roots appears in the holy text with the definite marker /ʔal-/, any case marker /-a,-u,-i/ or the indefinite marker/-n/ I would consider the occurrence of this stem as a stem-form. On the other hand, the inflected-forms are what appear in the holy text with a pronominal possessive suffix attached to, (e.g., 3Pers.Sing.Fem /-haa/). The logic in such action is related to the nature of the affixes, (i.e., the definite marker, case markers and the indefinite markers) in contrast to the pronominal suffixes. To explain, the definite marker /ʔal-/ is a prefix which means it does not typically affect the realization of the last consonantal sequence of the investigated CVCC roots. As for the case markers and nunation, as said before, these suffixes are not deleted in contextual realizations of stem-forms. Since the contextual realizations are more than the pausal realizations in the holy text, typically a stem-form surfaces with these suffixes. This typicality is because the holy text belongs to the classical era.

There are also specific prefixes, (e.g., [fa-], [bi-] and [la-]), which occurs in structures carrying different semantic component that affects the semantic meaning of an expression. They also have syntactic effects on the case marker that is realized in the word which they are attached to in terms of the grammatical relation that it marks, hence in terms of its phonetic value that surfaces. These prefixes appear attached to a stem-form and inflected-form of a word in the holy text. The transcriptions of words in the Appendix 2 display these prefixes. However, since they have no specific effects on the phonological realization of the final –CC they are not discussed.

These were commonly the procedures which each stem of the 60 underwent. However, I had to use another website search engine for some words, (e.g., [fadˤl-V] "Bounty") because later I faced difficulties when I tried to use the search engine of the first website. The second search engine belongs to the website http://corpus.quran.com. I continued using the search engine of this website whenever there was a need to search the holy text. The search engine of this website has some linguistic facilities (e.g., it offers a syntactic tree bank). However, it displayed the same limitation, (i.e., referring to different words that belong to the same word-family of the searched words). The focal point from

mentioning this is to advise that generally the same procedures were conducted when using the search engines of the two aforementioned websites.

It should be noted that there are many Qur'an search engines, and even though I utilized these two websites search engines I cannot claim that they offer the best tools or best results. Their selection as search engines was arbitrary and mainly to reduce the time of manually searching the holy text myself. In another words, this electronic search was a step in the search that saved time and effort.

Finally, the results of the search of each of the sixty roots are provided in Appendix 2, which consists of three tables 1, 2 and 3. The first column in these Tables introduces the word according to its basic meaning. The second column provides the results of the search in relation to number of occurrences in the Qur'an text. The third column allocates the exact Chapters and verses in which the investigated stem and its paradigms appear. The fourth column presents the articulations of the words as found in Alkhatiib's dictionary. The procedures that were conducted to obtain these structures from the dictionary are explained in the next subsection.

4.2.2.1 Alkhatiib's dictionary of the Qur'anic readings; a written corpus

According to Alkhatiib (2002, vol. 11, p. 21), the process of collecting the Qur'anic readings and publishing them in dictionaries has begun in the third Islamic century. Calculations estimate this to be around 815 C.E. A prominent name who participated in such process is Abu ʕubajd AlQaasim Ibn Sallaam (154/-224 A.H. /770-835 C.E.) who collected Qur'anic readings from 25 expert readers. Another collector is Ahmed Ibn Gubajr Ibn Muhammad AlKuufii (d. 258/871 A.H. /C.E.) who collected mainly five each from a distinctive Islamic region. Other names are also mentioned, however, these two are only offered as examples. As far as I can see, the process of collecting Qur'anic readings has enhanced the understanding of the essence of the Qur'anic readings in general. However, this stage was preceded by a period in which the collecting of the Qur'anic readings was mainly an oral process. The collection of the Qur'anic readings did not depend on documentation which distinguishes the collection in the third century. The development to the documentation in the collecting is due to different reasons. For instance, the papers and inks were more accessible to people because of the scientific discoveries of that century. In addition, literacy increased among people because it became a need. Moreover, because the society in that time enjoyed wealth and education the people themselves started to have different interests. Nonetheless, the oral collection for the Qur'anic readings is documented

through the citations. Those who collected the readings in the third century collected them from expert readers who themselves cited their articulations to preceded expert readers and those cited the transmitted articulations to those who preceded them and so on.

As for Alkhatiib's (2002) dictionary, it is found that Alkhatiib collects readings from early dictionaries among other written sources. He cites comments of the early collectors. These comments display establishing analytical tools used to describe linguistically the Qur'anic readings which they have collected. Therefore, it is unfortunate that I find modern sources that do not specify accurately the kind of work that the collectors practiced. An example for this is Owens (2006: 38) who did not use an accurate word to describe the nature of the process that the Qur'anic readings were subject to by these early collectors. Based on his words the process of collecting the reading involved 'commentary, evaluation and editing' (Owens, 2006: 38). The objection here is on the claim that there was 'editing' that the Qur'anic readings/articulations underwent. As far as I can see from the Alkhatiib's (2002) dictionary, even though collector's comments on the readings may manifest preference and criticism against a reading he does not modify it. What simply a user of such dictionaries finds are readings that are being evaluated in terms of *the degree of their authenticity* as articulations of the holy written script.

The previous brief introduction is intended to confirm that Alkhatiib (2002) essentially follows the preceded generations of scholarly Muslims by offering the readings and sometimes evaluating them. However, it is evident, based on his references, that he used mainly the written sources of the early and medieval centuries. I did not find in his dictionary an indication that he communicated with modern expert readers of the Qur'an. In this section Alkhatiib's (2002) dictionary is presented as a written corpus of the Qur'anic readings. Moreover, the process of searching utilizing this dictionary to obtain the data of the classical era, which appears in Appendix 2, is explained.

Alkhatiib's (2002) dictionary, which consists of 11 volumes, is very useful as a corpus for the Qur'anic readings. The collector offers interested users in the Qur'anic readings with many advantages for instance:

1- All readings for each verse in the holy text of the Qur'an which he found in earlier and medieval sources that he consulted.

2- The differences in the three linguistic levels previously explained; the phonetic-phonological, the morpho-phonological and morpho-syntactical levels.

3- The organizational layout and content of the dictionary is in accordance to the layout found in the مصحف *Musˤħaf*, whereby Chapters and verses correspond to one another. This makes it easier and more accessible when searching for any particular word.

4- The verses are written based to the Hafsˤ ʕan ʕaasˤim reading form. Thus, the diacritics on Uthmaanic outline/*rasm* which is used to transcribe the verses express the phonetic values of this reading form. Selecting Hafsˤ ʕan ʕaasˤim is considered a thoughtful act considering that this form of reading is the widest distributed in the Islamic world today.

5- The dictionary provides grammarians' views on the differences.

6- The names of expert readers whom readings are transmitted from appear in the dictionary.

7- In the last volume, a summary of the history of the Qur'an, Muslim scholars' views in relation to the legitimacy of the Qur'anic readings, prominent readers' names in the early centuries and a brief definition of them are given. Moreover, the early and medieval books that are concerned with the Qur'anic readings. It also contains indexes of all sources that are used, all names of people and the dialects that are mentioned in the dictionary.

Therefore, Alkhatiib's dictionary can be considered as a corpus of the Qur'anic readings that give researchers relatively unproblematic access to the Qur'anic readings. Thus, Alkhatiib's (2002) dictionary is of considerable value, whether it is used for the different readings of the verses or to ascertain how earlier and medieval Muslims have treated these differences. This value has been noted by Masˤluuħ who, being a grammarian/linguist himself, wrote the preface of the dictionary emphasizing on its advantages for those who are interested with the Arabic language history in terms of variations and change. As for his goals, Alkhatiib (2002, vol. 1: 9-10) explicitly declares that his dictionary was done with the goals to be loyal for the duty of science and 'ابتغاء مرضاة الله بخدمة كتابه' "to please THE GOD ﷻ by serving HIS book".

Nonetheless, limitations are found in this massive individual work. The natures of some of these limitations are summarized next. Firstly, the search for any word has to be conducted manually. This consumes time and efforts.

Secondly, although Alkhatiib offers users many details that are very insightful for those who are inexperienced with the terminologies and the history of the Qur'anic readings some difficulties appear occasionally which, in my view, are not mainly due to Alkhatiib's

style [3] but are also related to users' expertise with such terminologies. Therefore, lacking the adequate expertise, I had to consult an expert reader to explain specific terminologies and to pronounce specific words so that I can transcribe the exact documented pronunciation for some words. Anas Alkandari is the expert reader who was consulted as said before (see footnote 4 in chapter two).

Thirdly, Alkhatiib's silence in terms of specific issues may confuse a user. For instance, a user may note that a specific verse of specific Chapter does not appear in the dictionary, and find Alkhatiib is silent in front of this absence for the verse. As a Muslim, who is aware that the Qur'anic readings corresponds more than they differ, I interpreted this silence as Alkhatiib's way of saying there are no documented differences in terms of how these absent verses are pronounced. Another type of noted silence is that he does always offer pausal forms for the words. This may confuse considering that pausing in reading the holy text of the Qur'an is banned mainly in specific positions. Accordingly, I interpreted the silence over the missing pausal words as a way of informing that the pausal forms of these words follow the regular rules of pausing in SA. The justification for this interpretation is that I noted that Alkhatiib (2002) documents the pausal forms mainly when their structures are different from SA; hence they are the uncommon variations of the classical era. I think that this is his way to reduce the amount of details that are thought to be known for the expected readerships for the dictionary. In other words, he seems to have anticipation for those whom the dictionary is addressed for. Thus, he is acting upon this anticipation. Fourthly, errors and mistakes were found in the dictionary.

Worth mentioning, in terms of the style that Alkhatiib (2002) uses to present the information in his dictionary it is noticed that: the verse within the Uthmaanic outline is transcribed first based on the Hafsˤ ˤan ˤaasˤim reading form in a green font color and appears in the centre. This is followed by locating the disagreed articulations in the verse and transcribing them in the right side of a page in a green font color. What is transcribed is in the right side in green is again based on Hafsˤ ˤan ˤaasˤim reading form. The other articulations are transcribed in the black font color and appear after an indent from the green transcription. The black font color is also used to documents other materials which he collected about a disagreed articulation. The documentation of the materials might take more than a page. In appendix (7) a photocopy is offered of the page 3 in vol.1 of the dictionary.

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[3] Based to my own experience with his writing, his style in presenting the information may be described as very brief, highly technical and informative considering the length of a sentence and a paragraph.

4.2.2.2 The search in Alkhatiib's dictionary

After determining the 60 stems according to the previous criteria (section 4.2.1), and locating the exact occurrence of the stems and their paradigms in the holy text of the Qur'an, another search has been conducted. Utilizing Alkhatiib's (2002) dictionary of the Qur'anic readings, a manual search in its volumes was conducted for each word. That the layout of presenting the verses and Chapters corresponds with that of the مصحف *Mushaf* of the Qur'an proved to be an advantage as it eased its accessibility. However, the manual process and the amount of data had slowed the search for the word-forms of some stems. An example for such stems is "Earth" /ʔardˤ/, which in its both forms, (i.e., stem-form and inflected-forms) exhibited 459 total occurrences in the holy text of the Qur'an after the electronic and the sifted manual search. Nonetheless, the word-forms of each of the 60 nominal stems were examined in all the occurrence positions. This was done to ensure obtaining all the phonological structures, as well as to observe any contextual factors that may have affected the surfaced structures.

In appendix 2, the structures for each word that was found in Alkhatiib's (2002) dictionary are documented in tables. The only emphasis that I need to make it clear is that I only documented what I think of as the differences that are related to the investigation of this research. Therefore, only those phonetic-phonological differences are transcribed.

Worth mentioning, there is a type of differences that was not considered even though some appeared as a strategy to escape the superheavy syllable CVCC, this is, the morpho-phonological differences. It was noticed that some Qur'anic readings exhibited a morphological substitution (i.e., substituting the searched singular stem CVCC with another stem that belongs to the same family). This substitution is very limited and its role in avoiding the innovation of CVCC syllable was clear. This is because the substituted word has a word structure that is simpler than the singular form, (i.e., CVCC-V) whereas the plural forms that were found are CVCVC-V and CVVC-V. Nonetheless, overlooking this strategy is so that the research is not expanded. In addition, I admit that I did not immediately realize the significance of this substitution for my research. I noticed that it was limited in the Qur'anic readings possibly only two stems display it. The clear significance of this substitution was realized after carefully examining the MMA data which exhibited this substitution in number stems (i.e., 5 stems as far as the collected data). Thus, since investigating this strategy would require a recollecting for data I leave it for for future research that are interested with

morphological consequences of the loss. I also left for future research the effects of the assimilation phenomenon of the case markers as said in chapter two.

Finally, the obtained surfaces that were found in Alkhatiib's (2002) dictionary are offered as a whole in the appendix 2. This whole data appear in the fifth column in the tables. However, those data that shade lights on the investigation of this study are presented in tables that appear in section 4.4 of this chapter.

4.2.3 The collection of the modern data

Four modern Arabic dialects were selected to be part in the investigation: KħA, IBA, ECA and MMA. Overall, the native informants are the only source that is used to obtain the data of the aforementioned dialects. These data appear in the appendixes 3, 4, 5 and 6. In the next paragraphs, the process of obtaining the modern data from the informants is outlined.

Firstly, the collected data was obtained from no less than two informants for each of the four investigated dialect. After recording the informants, a transcription of their pronunciations for the words has been done. Worth mentioning, the informants were very helpful from different perspectives. Most of them talked about their dialects and compared it with essentially SA and sometimes other modern Arabic dialects. They described, as much as they can, the sound they were producing when they were asked about it. This helped the transcription.

Another point that should be mentioned is that I found that not all the 60 stems are in fact part of the used vocabularies in the four dialects. Although I have checked with a native speaker of each of the investigated dialects that the 60 stems are among the used vocabularies before collecting the data, but it seems that there was a misunderstanding on the part of both the native speaker and me. To explain, there were instance(s) in which the native informants of an investigated dialect agreed that a specific stem of the 60 stems is mainly used in its stem-form. There were also instance(s) in which they agreed that specific inflected-form(s) in the paradigm of a stem are not used. For example, my Iraqi informants agreed that none of the inflected-forms of /ʃajʔ/ "thing" is used in IBA and affirmed that only the stem-form is part of the used vocabularies. Missing to ask about the use of all word-forms when checking whether the 60 stems are part of the vocabulary of the investigated dialects is a mistake I made. On the other hand, some informants agreed that some of the 60 stems are not part of their dialects vocabularies in all word-forms. In such case they would inform me that another word is used to express the same meaning. For example, my Moroccan informants informed me that for the word "Stinginess" they would pronounce [siqraam] instead of the investigated

stem /buxl/. I think that the reason behind this inconsistency between what I have been informed by the native speaker, who checked the 60 stems before collecting the data, and the native speakers who actually supplied me with the data is that I did not consider the role of education and the extent of practicing SA. Generally, the native speakers who checked the 60 roots before collecting the data were high educated persons. Nonetheless, in both cases I asked the informants to suggest a pronunciation. Some speakers would provide me with my request others may express their inability to do so. Hence, the empty slots that appear in the tables of the modern dialects in the appendixes 3, 4, 5, and 6 are because the informants did not provide me with a pronunciation.

As can be seen from the tables that appear in the aforementioned Appendixes, what the informants were asked to pronounce are the stem-form, the inflected-forms with the 1Pers possessives, the inflected-forms with 2Pers possessives and lastly the inflected-forms with 3Pers possessives. An example for this is: the stem /laħm/ "meat". An informant would first give the stem-form. The KħA native speakers produced [laħ*a*m]. These speakers then provided the inflected-forms of /laħm/, these are [laħm-i] "meat.1Pers.Sing", [laħ*a*m-na] "meat.1Pers.Plur", [laħm-ik] "meat.2Pers.Sing.Masc", [laħm-iʧ] "meat.2Pers.Sing.Fem", [laħ*a*m-kum] "meat.2Pers.Plur", [laħm-a] "meat.3Pers.Sing.Masc", [laħ*a*m-ha] "meat.3Pers.Sing.Fem" and [laħ*a*m-hum] "meat.3Pers.Plur".

Furthermore, I have to alert that the words were not pronounced in context. To explain, each pronunciation is for a word that is at the end of the utterance. Accordingly, based on the definition of the pausal forms all the data of both stem-forms and inflected-forms of the investigated modern Arabic dialects can considered pausal forms.

Finally, it should be noted that the transcription of the data provides mainly what has been thought to be important for the sake of this study's investigation. Accordingly, I did not provide any detail of the stress position, and even the pharyngealization phenomenon was not documented thoroughly.

4.3 The data

In this section, the collected data of both eras are introduced and discussed. The subsections 4.3.1 and 4.3.2 observe the data and make conclusions. The focus of the subsection 4.3.1 is classical data whereas the focus on the modern data is in the subsection 4.3.2. The discussion that aims to form specific generalizations related to the tested hypothesis of this study appears in the subsection 4.3.3.

4.3.1 The data of the classical era

The manual process of searching Alkhatiib's (2002) dictionary to obtain the variations in the pronunciation of the 60 nominal stems in all paradigms forms has revealed very interesting observations. The most significant observation is that the collected data display that there was a process of u-insertion that emerges in the CuCC roots type in the seventh century. It is also observed that u-insertion invoked in the CuCC root which have potential of violating SSP more than those that do not have this potential. Note that of the 60 searched stems, the total amount of those CVCC stems that have the potential of violating SSP is 27 stems. This in percentage means that 45% of the total data would violate SSP if the case marker is not in the surface. In the classical era surfacing final CC that violates SSP existed mainly in pausal position. Hence, just like the realization of CVCC syllable type, the violation of SSP was unmarked mainly in pausal forms in the classical era. That u-insertion appears more in CuCC roots that have potential of violating SSP than those that do not have the potential necessities considering the violation of SSP a main factor. Therefore, the organization in the presentation of results is based on the violation of SSP. As will be seen, the observations and conclusions that are about the roots that have the potential of violating SSP appear in 4.3.1.1 whereas the observations and conclusions that are about the roots that do not have the potential of violating SSP appear in 4.3.1.2. In the subsection 4.3.1.3 an overall is presented.

Alkhatiib (2002) does not provide the pausal forms of all data, as said before, whether in their stem-form or inflected-form. His silence was interpreted as a way of informing that the pausal forms are compatible with the known pausal forms of SA. Notably, the few pausal forms which he provides are distinctive as they display other classical variations. Hence, for those words, which Alkhatiib (2002) does not provide pausal forms, the pausal forms of SA were transcribed in the cells of the tables that appear in this chapter. However, note that the tables in appendix 2 document only those pausal forms that were actually found in Alkhatiib's dictionary.

4.3.1.1 CVCC stems with SSP potential violation

Only the data in which the surfacing of the –CC would potentially violate SSP are displayed and discussed in this section. Hence, 45% of the total amount of classical data is discussed here. This is in number, 27 stems of the 60 stems. The observations and the conclusions of the 27 stems are based on both word-forms, (i.e., stem-forms and inflected-forms). They are about the resolutions that were noticed to avoid SSP violation. It is noticed

that only 10 of these 27 roots that display resolutions. This result makes us conclude that 37% of the data that has the potential to violate SSP avoid the violation. The aim next is to give observations and make conclusions about two resolutions that are found in the data. The first resolution is observed mainly in CuCC roots whereas the second resolution is observed in CaʔC and CiʔC roots.

Resolving SSP violation in CuCC

The 20 stems of CuCC consist of 11 stems with SSP potential violation. The following observations were noted when examining these 11 stems. Examples appear in the tables 4.2a and 4.2b below.

i.   7 stems display a process of u-insertion in the stem-form as a resolution to avoid SSP violation (see: all the examples in table 4.2a below).

ii.   Of these 7 stems, 2 display the u-insertion in both the stem-form and inflected-form (see: 2 and 6 in table 4.2a and 1 and 2 in table 4.2b).

iii. Of these 7 stems, 2 stems display substituting the root vowel /u/ with a back vowel /a/ and inserting either /a/ or /i/ to avoid the SSP violation (see: 1 and 6 in table 4.2a).

iv.   Of these 7 stems, 1 displays realizations in which the root vowel /u/ is substituted with a front vowel /i/. One of these realizations displays a process of i-insertion to avoid SSP violation (see: 1 in table 4.2a).

v.   The stem in 1 in table 4.2a is significance. It has several realizations which display different vowel-substitutions for the root round vowel and different vowel-insertions.

vi.   All the 7 stem-forms give at least two surfaces; one that avoids SSP violation and other does not.

Starting with explaining the first observation, as can be seen from table 4.2a below; all the 7 roots manifest the process u-insertion in both contextual forms and pausal forms. However, be aware that Alkhatiib (2002) does not provide pausal forms for any of these words and his silent regarding the pausal forms was interpreted as his way of informing that they follow the rules of SA. No difficulty was faced when proposing a pausal form for the contextual forms of these words because they are all in terms of the word-structure type and phonetic values surface in SA. Thus, the pausal forms that appear in 4.2a are assumed based on the rules of SA. The only exception is [ħusn-ee] which appears boldfaced **[ħusn-ee]** in the pausal forms cell of example (7) in the table 4.2a. The dificality about [ħusn-ee] is that phonetically it surfaces [ee], hence; it displays *ʔal-ʔimaala* a process that does not operate in SA. However, I postulate that the contextual form [ħusn-ee] pauses as **[ħusn-ee]**. The justification behind this postulation is what is known about *ʔal-ʔimaala*.

As said in chapter one, *Ɂal-Ɂimaala* process, which affects the realization of [aa] among other phonemic vowels, does not appear in SA, (i.e., the more common variation in the classical era). Yet, operating this process is documented as a noticed process that appears in other classical variations in the eighth century by Sibawaih in his book. Critically, however, the contextual [ħusn-ee] is from a source that belongs to the seventh century, (i.e., the Qur'anic readings). However, *Ɂal-Ɂimaala* is attested well in the Qur'anic readings. My experience with Alkhatiib's (2002) dictionary and other Islamic sources allowed me to see different examples of *Ɂal-Ɂimaala*, and even though I did not contrast the occurrence of *Ɂal-Ɂimaala* in the Qur'anic readings with what Sibawaih says about it but, generally, no distinct was detected or noticed. Therefore, since Sibawaih, as seen in chapter one, informs that there are Arabs who produce *Ɂal-Ɂimaala* in both pausal and contextual forms and that there are Arabs who restricted it to the pausal position I think that the same three patterns existed in the seventh century.

Thus, considering what was said about the phonological environments of *Ɂal-Ɂimaala* and the other classical patterns, I assume the following. The contextual form and its pausal form in example 7, (i.e., [ħusn-ee]→**[ħusn-ee])** is a pattern resulted from processing the indefinite accusative /-a-n/ by first deleting the nasal, compensating it by lengthening the accusative back /a/, and then this [aa] underwent *Ɂal-Ɂimaala*. This means that *Ɂal-Ɂimaala* began in the earliest stage of its emergence first in the pausal position, and then later it was operated in contextual forms. It also means that of those classical variations that Sibawaih documents for such words, (i.e., indefinite accusative words) it is the more common variation's pattern what should be established as the eldest. The other patterns which Sibawaih acknowledges to belong to other dialectal variations should be established as younger. Observe that deleting the nasal and lengthening /a/ is the pausal marker in the more common variation, (i.e., SA) for this type of words. Thus, the pausal form of this variation forms the most wide distributed phonological environment for *Ɂal-Ɂimaala*. Since *Ɂal-Ɂimaala* was crucially targeting the phoneme [aa] I do not think that this process is provoked to prevent the final-CC; rather, I think that it is a sound change that is affecting phonemic vowels in Arabic, in particular the long back [aa]. The following are the known patterns for the indefinite accusative words ordered based on the concluded stages for the emergence of *Ɂal-Ɂimaala* in Arabic.

	Contextual	Pausal	
Stage 1	[ħusn-a-n]→	[ħusn-aa]	The eldest pattern that is assumed is SA realizations
Stage 2	[ħusn-aa]→	[ħusn-ee]	[aa] underwent *Ɂal-Ɂimaala* in a later development
Stage 3	[ħusn-ee]→	[ħusn-ee]	later [ee] surfaces not only in pause but also context

As for u-insertion, its amount of processing in contrast to the amount of processing a-insertion and i-insertion suggests that it was the beginning of the vowel-insertion in Arabic phonology. Therefore, this study concludes that u-insertion is the beginning of the most-wide vowel insertion that is witnessed in the modern Arabic dialects.

In relation to a-insertion and i-insertion, it is observed that i-insertion, in contrast to Hamid's (1984) modern SCA data, is the less distributed in the data of the seventh century. On the other hand, there are substantiations that demonstrate that a-insertion and i-insertion are secondary processes in contrast to u-insertion. I refer to them as secondary processes in the sense that they follow the substituting of the root round vowel. That a-insertion and i-insertion follow the substitution of the round root vowel is evident from the data in (1) in table 4.2a.

As can be seen, there are contextual and pausal forms that surface the substituted vowels [i] and [a] instead of the round vowel in (1), (e.g., [bi-l-b*a*xl-i] and its paused form [bi-l-b*a*xl]). These two realizations in which no insertion of either the front /i/ or the back /a/ appears are taken as substantiations that the substitution preceded the insertion. This is interesting because phonology is doing the opposite of what Hamid's (1984) thesis anticipated, (i.e., the basic epenthetic vowel thesis). Clearly, what phonology does is compatible with Hamid's explanation for CiCC realizing as CuCuC (see: 3.4.1.2 in chapter three). Thus, it is substituting the quality of the underlying vowel and then inserting a vowel that harmonizes with the new substituted vowel. That the vowel insertion is following the substitution not preceding it is evident from [bi-l-b*axa*l-i]→[bi-l-b*axa*l] and [bi-l-b*ixi*l]→[bi-l-b*ixi*l-i]. These two realizations display the substitution and the insertion of a vowel that harmonizes with the new substituted vowel. In addition, the findings show that there are [bi-l-b*a*xl-i] and [bi-l-b*i*xl-i] but there are not [bi-l-bux*a*l-i] or [bi-l-bux*i*l-i]. In other words, there is no realization that displays the insertion without the substitution but there are realizations that display the substitution without the insertion. Therefore, phonology in resolving SSP violation is creating complexity through targeting the lexical components.

Other observations about a-insertion and i-insertion explain the modern findings of Hamid (1984) in SCA that is related to the wide distribution of i-insertion in contrast to the distribution of a-insertion and u-insertion. Notably, even though it is the least distributed in that era in contrast to u-insertion and a-insertion, yet two phonological environments get supplied with /i/. These environments are recognized from the examples it occurs in [bi-l-b*axi*l-i]≈[bi-l-b*ixi*l-i]. As can be noticed, /i/ is inserted in structures that display a root-vowel

substitution of /u/ to /i/ and /u/ to /a/. Thus, substituting the high back round vowel /u/ with the low back vowel /a/ is not necessarily followed with a-insertion. Rather, i-insertion might follow the a-substitution or precede it as no evidence is found to make a view in the realizations of the type CaCiC as far as the collected data.

Another note is that, based on the data, substituting /u/ to realize as /a/ is more preferred by phonology. This selectivity that is made by the phonology is of interest considering that both types of substitution include a one shared feature between the involved segments. These are the feature back between /u/ and /a/, and the feature high between /u/ and /i/.

On the other hand, the set that has the potential to violate SSP displays a-substitution process in a word-formation of a CiCC root. This word is [fiʕl-a] ≈ [faʕl-a] "Action.Acc". The existence of this example demonstrates that a-substitution, in contrast to i-substitution, have already expanded to another type of CVCC roots.

N	The word input	Contextual forms	Pausal forms
1	"Stinginess" /buxl-V/	[bi-l-buxl-i]≈[bi-l-bux*u*l-i]≈[bi-l-b*a*x*a*l-i]≈[bi-l-b*a*xl-i]≈[bi-l-b*a*x*i*l-i]≈[bi-l-b*i*xl-i]≈[bi-l-b*i*x*i*l-i]	[bi-l-buxl-i]→[bi-l-buxl] [bi-l-bux*u*l-i]→[bi-l-bux*u*l] [bi-l-b*a*x*a*l-i]→[bi-l-b*a*x*a*l] [bi-l-b*a*xl-i]→[bi-l-b*a*xl] [bi-l-b*a*x*i*l-i]→[bi-l-b*a*x*i*l] [bi-l-b*i*xl]→ [bi-l-b*i*xl] [bi-l-b*i*x*i*l]→[bi-l-b*i*x*i*l-i]
2	"Nook" /rukn-V/	[rukn-i-n]≈[ruk*u*n-i-n]	[rukn-i-n]→[rukn] [ruk*u*n-i-n]→[ruk*u*n]
3	"Morning" /sˤubħ-V/	[ʔa-sˤsˤubħ-u]≈[ʔa-sˤsˤub*u*ħ-u] [sˤubħ-a-n] [ʔa-sˤsˤubħ-i]	[ʔa-sˤsˤubħ-u], [ʔa-sˤsˤubħ-i] →[ʔa-sˤsˤubħ] [ʔa-sˤsˤub*u*ħ-u] →[ʔa-sˤsˤub*u*ħ] [sˤubħ-a-n]→[sˤubħ-aa]
4	"Judgment" /ħukm-V/	[ʔal-ħukm-u]≈[ʔal-ħuk*u*m-u] [ʔal-ħukm-a] [ħukm-a-n]≈[ħuk*u*m-a-n]	[ʔal-ħukm-u]→[ʔal-ħukm] [ʔal-ħuk*u*m-u]→[ʔal-ħuk*u*m] [ʔal-ħukm-a]→[ʔal-ħukm] [ħukm-a-n]→[ħukm-aa] [ħuk*u*m-a-n]→[ħuk*u*m-aa]
5	"Excuse" /ʕuðr-V/	[ʕuðr-a-n]≈[ʕuð*u*r-a-n]	[ʕuðr-a-n] →[ʕuðr-aa] [ʕuð*u*r-a-n] →[ʕuð*u*r-aa]
6	"Grief" /ħuzn-V/	[ħ*a*z*a*n-a-n]≈[ħuzn-a-n] [ʔal-ħuzn-i]≈[ʔal-ħuz*u*n-i]≈[ʔal-ħ*a*z*a*n-i]	[ħazan-a-n]→[ħazan-aa] [ħuzn-a-n]→[ħuzn-aa] [ʔal-ħuzn-i]→[ʔal-ħuzn] [ʔal-ħuz*u*n-i]→[ʔal-ħuz*u*n] [ʔal-ħ*a*z*a*n-i]→[ʔal-ħ*a*z*a*n]
7	"Beauty" /ħusn-V/	[ħusn-u] [ħusn-a-n]≈[ħus*u*n-a-n]≈[ħusn-ee] [ħusn-a]	[ħusn-u]→[ħusn] [ħusn-u-n]→[ħusn-aa] [ħus*u*n-u-n]-→[ħus*u*n-aa] [ħusn-ee]→**[ħusn-ee]** [ħusn-u]→[ħusn]

Table 4.2a: *CuCC* stem-forms resolving SSP violation with u-insertion

The observation that all the 7 stem-forms display two surfaces; one that avoids the violation of SSP whereas the other does not, lead to conclude that in that early stage Arabic grammar was already reshaping towards accommodating the change through creating variations, (i.e., a variation that restrain to SSP and a variation that does not restrain to SSP).

N	The word	Contextual form	Pausal form
1	"To his nook"	[bi-rukn-i-hi]≈[bi-ruk*u*n-i-hi]	[bi-rukn-i-hi]→[bi-rukn-i-h]
			[bi-ruk*u*n-i-hi]→bi-ruk*u*n-i-h]
2	"My grief"	[ħuzn-ii]≈[ħuz*u*n-ii]	[ħuzn-ii]→[ħuzn-ii]
			[ħuz*u*n-ii]→[ħuz*u*n-ii]
3	"Their good/ beauty"	[ħusn-u-hunna]	[ħusn-u-hunna*h*]

Table 4.2b: *CuCC* inflected-forms in which surfacing –CC would violate SSP

The inflected-form that appears in (3) in table 4.2b displays a consonant insertion. The voiceless glottal fricative /h/, which appears in italic in the highlighted pausal form, is a pausal marker. This pausal realization is highlighted as an indication that in contrast to the other pausal forms, this one is transcribed in Alkhatiib's (2002) dictionary. On the other hand, even though Alkhatiib does not transcribe pausal forms that display the vowel insertion but his discussions for the contextual forms show that indeed they too display the vowel insertion. The core of these discussions is a thesis made by scholarly Muslims about the origin of these simplified structures.

Muslim scholars' comments on the process of vowel insertion show that they have already established that this process is to prevent النقل "the heaviness"; (i.e., in WL the consonant cluster) which results due to deleting the case marker as a marker for pausing. They also made the deduction that this process appeared first in the pausal position and then later on the new surfaced form was used by some Arabs contextually. This is expressed in the technical expression 'أجرى الوصل مجرى الوقف'. They also have recognized that the phonetic value of the inserted vowel is because it is *following* the phonetic value of the root-vowel. The term 'الاتباع', which literary means "the following" is better translated within WL terminologies to *copying*. These two establishments of scholarly Muslims are adopted in this study. That the pausal position is the position in which the vowel insertion emerged has substantiations. These include the motive of the insertion process, (i.e., the straightforward: breaking –CC, avoiding the violation of SSP in some stems and avoiding the innovation in the syllabic inventory of Arabic phonology). That the vowel is a copy from lexical underlying root vowel is also evident. Yet the extent of copying the underlying vowel affirms that copying was not leaned on completely.

Finally, the distribution of resolving SSP violation in stem-forms and inflected-forms is different. In numbers, stem-forms display more resistance for the violation than inflected-forms. It was noticed that the stem-form of a root may display a resolution but not the inflected-forms of the same root. For instance, the vowel insertion as a resolution might appear in a stem-form without appearing in the inflected-form but no example was found for the vice versa. Thus, I think that a resolution emerges in the stem-form and in a later stage it operates in the inflected-forms.

Resolving SSP in CaʔC and CiʔC

Among the 27 stems, which have the potential of violating SSP, there are 3 roots that are of the type CaʔC and CiʔC. Examples of the word-forms that were found in the Qur'anic readings are presented in the table 4.3 below. The table 4.3 displays both the contextual and pausal forms of these roots. All the highlighted pausal forms appear in Alkhatiib's (2002) dictionary.

N	The word	contextual form	A pausal genitive inflected-form
1	"Head.Gen" /raʔs-V/	[bi-raʔs-i]≈[bi-raas-i]	[bi-raʔsi]→[bi-raʔs]≈[bi-raas] [bi-raasi]→[bi-raas]
2	"His head.Gen" /raʔs-V-hi/	[raʔs-i-hi]≈[raas-i-hi] "his head"	[raʔs-i-hi]→[raʔs-i-h]≈[raas-i-h] [raas-i-hi]→[raas-i-h]
3	"A well.Gen" /biʔr-V/	[biʔr-i-n]≈[biir-i-n]	[biʔr-i-n]→[biʔr]≈[biir] [biir-i-n]→[biir]
4	"A Wolf.Nom" /ðiʔb-V/	[ʔa-ððiʔb-u]≈[ʔaððiib-u]	[ʔa-ððiʔb-u]→[ʔa-ððiʔb]≈[ʔaððiib] [ʔaððiib-u]→[ʔaððiib]

Table 4.3: *CaʔC and CiʔC* stem-forms and inflected-forms that have the potential of violating SSP

The following are the observations that the examination revealed on:

i. Even though the underling input of a stem-form is either CaʔC-V or CiʔC-V but each of these two inputs has two contextual stem-form outputs. These are CaʔC-V or CaaC-V for the input CaʔC-V, and the outputs CiʔC-V or CiiC-V for the input CiʔC-V. Hence, in general, there is an output that surfaces the underlying glottal stop and an output that deletes the glottal stop and lengthens the preceding vowel regardless of its phonetic value /a/ or /i/. Notably, the pausal forms are also two, (i.e., CaʔC and CaaC for the stem-form CaʔC-V, and CiʔC and CiiC for the stem-form CiʔC-V). Hence, there are two pausal forms for those contextual stem-forms that surface the glottal stop. In contrast, each contextual stem-form that does not have a glottal stop has only one pausal form, (i.e., CaaC for CaaC-V, and CiiC for CiiC-V).

ii. In contextual forms, the realizations of the complex syllables CaʔC, CiʔC, CaaC and CiiC are resolved whether they were part of a stem-form structure or an inflected-form structure because of the case suffix. In addition, the case suffix resolves these

syllables in the pausal inflected-forms as it does not get deleted due to being a non-final suffix. In contrast, because the vocalic case suffix gets deleted in the pausal stem-forms the four complex syllables surface. Note, however, that the collected data does not include all the pausal realizations of the nunated accusative of these words, (i.e., the indefinite accusative). As said before, the unique about the indefinite accusative is that it is the only type of nominal words in which the accusative case inflection does not get deleted when pausing. Rather, the nasal /n/ which marks the indefiniteness gets deleted and the accusative vocalic case /a/ gets lengthening when the word is paused. Therefore, to complete the set based on what are known of SA rules for indefinite accusative forms, the contextual realization of CVʔC-a-n is already known because it is a structure in SA. Therefore, [raʔs-a-n] "a head.ACC" is known to surface as [raʔs] when paused. On the other hand, the contextual realization that displays ʔ-deletion [raas-a-n] "a head.ACC" is not a surfaced structure in SA. This puts dificality on coming with its pausal form. However, I anticipate that it would have the pausal form [raas-aa]. This anticipation is based on the pausal forms of similar contextual words that surface in SA, (e.g., [baab-an] "a door.ACC" pauses as [baab]).

iii. Even though there are only two consistent pausal forms (i.e., CVʔC and CVVC) but the two surfaces are not surfacing for the same contextual realizations. As can be seen from table 4.3, CVʔC surfaces as a pause form for only CVʔC-V-n whereas CVVC surfaces for both CVʔC-V-n and CVVC-V-n. This confirms that phonology targets the glottal stop. Hence, the process ʔ-deletion is because of a segmental requirement not a syllabic requirement.

From these observations, it is concluded that the glottal stop in the seventh century used to undergo deletion process by some Arabs. The deleted glottal stop is compensated by lengthening the preceding vocalic segment, (i.e., either /a/ or /i/ in the above examples). These two processes, in terms of the position of origin, occurred first in the pausal position, and later they were operated contextually by some Arabs. This is the Muslim scholars' established interpretation for the historical origin of the noticed different realizations of such words. It appears in Alkhatiib's (2002) dictionary when introducing the above transcriptions of the Qur'anic readings. This interpretation is evident because, notably, the contextual stem-realizations that have ʔ, in contrast to those that do not have ʔ, have two pausal forms; one surfaces ʔ other does not. Thus, this study also adopts the interpretation of Muslim scholarly here. In addition, it concludes that the phonological machinery of Arabic in that era was

involved in reducing the amount of phonological environments in which the glottal stop is legitimately surfaced since it is a root-consonant. This target is done by operating the deletion and compensatory lengthening devices.

To explain the conclusion, I do not think that these two processes were essentially employed for the syllabic requirements. Hence, they are not resolution processes for the syllabic innovation or coda complexity. Rather, I think they were targeting the glottal stop as a phonemic consonant in Arabic. Hence, the trigger of these two processes is not syllable structure requirement; rather it is the state of the sound /ʔ/ as a phoneme in Arabic. This reasoning is justified with the goal of the two processes and the distribution of surfacing the underlying ʔ. These are elaborated upon next.

The two processes do not ban the innovation in Arabic syllabic inventory; rather they mainly change the innovated syllabic type. Notably, instead of CiCC or CaCC the surfaced is the superheavy syllables CiiC and CaaC. This can be taken as a support for the claims that Arabic phonology tolerates the superheavy syllable type CVVC more than the CVCC superheavy syllable type (see: Watson 2007: 348). Nonetheless, as said, this demonstrates that the processes ʔ-deletion and compensatory lengthening, in contrast to the vocalic insertion, contributed towards expanding the Arabic syllabic inventory. Yet, the two processes, arguably, were not targeting increasing the syllabic inventory in Arabic by modifying the state of CVVC in Arabic phonology. In other words, they were not employed by phonology with the mission of legitimizing CVVC syllable type either, whether as a syllable type in the inventory or over the CVCC syllable type. Rather, it is argued that they were targeting dis-legitimizing the glottal stop sound in Arabic phonology as a phoneme. Therefore, they are processes employed for sound-change not syllable-change even though the two types of phonological change have resulted because of them in Arabic.

The CVVC was, just like CVCC, a non-canonical syllable type. In the classical era, if CVVC was realized, then this realization is, as far as the documentations, is exclusive to the pausal position. However, as can be seen from Watson (2007), the state of CVVC, generally, in the modern Arabic dialect is more legitimate than CVCC. The legitimacy of CVVC in the grammars of modern Arabic dialects is a side-effect of employing strategies with different goals. The first strategy is the ʔ-deletion and the compensatory lengthening that follows this ʔ-deletion which targets the state of /ʔ/ in Arabic phonology. The second strategy is the vocalic case deletion, which in the classical era was a pausal marker for big amount of Arabic words. Even though this marking strategy is functional syntactically and to some extent

semantically but the Arabic phonology did not like its direct consequences on the syllable structures or the syllabic inventory.

The direct consequences of the two strategies are introducing the superheavy syllables CVCC and CVVC in syllable structures of Arabic words and in the syllabic inventory. As for the syllable structures, the situation was phonologically critical in the pausal position. This is because Arabic does not posit restriction that considers the sonority. However, this non-consideration was not problem because of the role of case inflection in avoiding consonant clusters. But, due to the phonological reduction of the segmental component of case inflections, and the continual need for pausal markers the pausal position became a *source* for importing structures that do not only have syllabic complexity but also violate SSP because of this complexity. Nonetheless, it is predictable that the consequences on the syllable structures are speedier than the consequences on the syllabic inventory. Moreover, it is predicted that adopting the two types of consequences in the grammar is going to be gradual.

On the other hand, so that what is observed is reasoned, note that the first strategy that was behind the legitimacy of CVVC motivates a phonological goal, (i.e., the phonemic state of ʔ), whereas the second strategy motivates a syntactical-semantic goal, (i.e., marking pause). These goals are fulfilled through strategies that have phonological consequences that conflict with the synchronic phonological grammar of that era. I assume that fulfilling the goals can be done through other strategies that do not conflict with the synchronic phonological grammar, hence, preserving a steady and a constant grammar. However, it can be seen that it is phonology which adopts the consequences preferring change over steadiness and stability in its grammar. In addition, it appears that phonology is manufactured to create diversity not uniformity. Thus, what phonology establishes is splitting a systematized grammar into systematized grammars, (e.g., a grammar that accommodates an innovation and a grammar that does not). This point will be raised again later.

It is worth to mention that, the case deletion in stems like /baab-V/ "door", which underlyingly have CVVC, notably, results on surfacing CVVC in Arabic. Thus, because of the loss, it is expected that such di-consonant nominal stems are going to surface as CVVC in the modern era. As far as I know, this expectation is met in modern Arabic dialects; KħA for instance, surfaces the words /baab-V/ "door" as [baab], /nuur-V/ "light" as [nuur] and /daar-V/ "room" as [daar]. Nonetheless, I probably should mention here that inferring that these stems consist underlyingly of *two consonants* separated with long vowel contradicts a morphological establishment of ALT. The theoretical establishment of ALT would disagree with this di-consonant root analysis because Arabic verbal and nominal words are assumed to

have at least tri-consonant root. Thus, for the above stems and other similar to them, the long vowel that is between the two root consonants is assumed to be a glide /w/ or /j/. This assumption is based on the word-formations that appear in the same word-family of these stems; as in these word-formations one finds at least one stem that surfaces a glide instead of the long vowel. For example, the broken plural of the word [baab-V] surfaces as [ʔabwaab-V] "doors", the same is observed for the word [nuur-V]→[ʔanwaar.V] "lights". Therefore, instead of assuming the long back vowel is the underlying form, ALT assumes that underlyingly this word has the labial-velar glide /w/. However, observe that the paradigm of the singular stems [baab-V] and [nuur-V] does not surface except the long vowel just as the paradigm of the plural stems [ʔabwaab-V] and [ʔanwaar.V] do not surface except /w/.

Moreover, observe that the plural of such stems does not always surface a glide consonant, rather, it might surface another type of phonemic vowel, [daar-V]→[duur-V] "room/rooms", but the diminutive formation of this word, (i.e., [duwajrat-V]) surfaces the glide /w/.

In terms of the distribution of surfacing the underlying ʔ, among the 27 stems, which categorically recognized because of the potential of violating SSP they possess, there is a root that is ʔ-initially. This is /ʔiðn/. When pausing the word-formations of /ʔiðn/, the initial glottal stop, based on Alkhatiib (2002), surfaces in its typical phonemic state in all the Qur'anic readings. The one exclusion is the Qur'anic reading form that is known as قراءة حمزة "Ħamzah's reading form". This reading form has two pausal surfaces for this word. In this reading, the word-formations of /ʔiðn/ may realize the glottal stop in its typical phonemic state or as the intermediate glottal stop. The term intermediate glottal stop is introduced as a glottalization for a vowel (see chapter one). This finding, confirms that the glottal stop was targeted in positions other than codas. The root /ʔiðn/ is an example for an underlyingly initial glottal stop, whereas in the examples that appear in table 4.3 the glottal stop is a root-middle. On the other hand, this finding shows that even though pausing phenomenon is essentially a right-edge phenomenon but the left-edge of a word might be accessed by some processes that exclusively are operated in pausal position.

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4.3.1.2 CVCC stems without a potential violation of SSP

The focus in this section is on the data in which surfacing the final –CC of the root does not have the potential of violating SSP. The whole set of this type of data is 33 stems. However, of these stems only those that exhibit a realization that avoids surfacing the complex –CC in any of the word-formations are observed. Therefore, the exact number of the

roots which are discussed here is less. Following the same rhythm of the previous subsection, partial data appears in tables due to the nature of what are observed and assessed. However, I have to alert that being untrained in phonetics or *Taʒwiid* "The science of reading the Qur'an" is a weakness as mistakes might exist in the transcription in particular for specific realizations that include the glottal stop.

Nonetheless, the findings of the examination that was conducted on the classical data are pursued here. This is done by observing the set of roots, which do not have a potential to violate SSP, in terms of the vowel insertion, the root-vowel substitution and the roots with a glottal stop. More lights are shed on the phonology of the classical era were found through the findings. The main findings are, firstly, u-insertion appears in some word-formation of only CuCC roots. Another finding is that, in contrast to i-substitution, a-substitution is operated in this set of data. Finally, more evidence that sustains the argument that the glottal stop in the classical era was not stable as a phoneme was found. The italic headings are used again to organize the presentation.

Insertion

The table 4.4 below introduces examples extracted from the data that display the insertion in the set of those 33 roots that do not have a potential to violate SSP. As can be seen, both contextual and pausal forms are offered. The highlighted pausal forms are from Alkhatiib's dictionary, whereas those that are not highlighted are based on the rules of SA.

N	The word	Contextual forms	Pausal forms
1	"Part" /ʒuzʔ-V/	Nom: [ʒuzʔ-u-n]≈ [ʒuzu̇ʔ-u-n]≈[ʒuzz-u-n] Acc: [ʒuzʔ-a-n]≈ [ʒuzu̇ʔ-a-n] ≈ [ʒuzz-a-n]≈ *[ʒuzuw-a-n]*≈ (described as ʃaað "irrguler") *[ʒuzV^G-a-n]* (described as dˤaʕiif "weak")	**Nom:** [ʒuzʔ-u-n]→[ʒuzʔ]≈[ʒuzz] [ʒuzu̇ʔ-u-n]→[ʒuzu̇ʔ] [ʒuzz-u-n]→[ʒuzz] **Acc:** [ʒuzʔ-a-n]→[ʒuzʔ-aa]≈[ʒuzz-aa] [ʒuzu̇ʔ-a-n]→[ʒuzu̇ʔ-aa] [ʒuzz-a-n]→[ʒuzz-aa] *[ʒuzuw-a-n]*→[ʒuzuw] *[ʒuzV^G a-n]*→ [ʒuzV^Ga]
2	"Injustice" /ðˤulm-V/	[ðˤulm-a-n]≈[ðˤulu̇m-a-n] [ðˤulm-i-n]	**Acc:** [ðˤulˤm-a]→[ðˤulˤm] [ðˤulm-a-n]→[ðˤulm-aa] **Nom:** [ðˤulu̇m-a-n]→[ðˤulum-a] **Gen:** [ðˤulm-i-n]→[ðˤulm]
3	"Custom" /ʕurf-V/	[ʕurf-a-n]≈[ʕuru̇f-a-n] [bi-l-ʕurf-i]≈[bi-l-ʕuru̇f-i]	**Acc:** [ʕurf-a-n]→[ʕurf] **Gen:** [bi-l-ʕurf-i]→[ʕurf] **Nom:** [ʕuru̇f-a-n]→[ʕuruf] [bi-l-ʕuru̇f→[bi-l-ʕuruf]
4	"Fright" /ruʕb-V/	[ruʕb-a-n]≈[ruʕu̇b-a-n] [ʔa-rruʕb-a-n]≈[ʔa-ruʕu̇b-a-n]	**Acc:** [ruʕu̇b-a-n]→[ruʕub-aa] [ruʕb-a-n]→[ruʕb-aa] [ʔa-rruʕb-a-n]→[ʔa-ruʕb-aa] [ʔa-ruʕu̇b-a-n]→[ʔa-ruʕub-aa]

Table 4.4: u-insertion in *CuCC* stems without potential of violating the SSP

Several observations are noticed from the data that appear in table 4.4:

i.   Only u-insertion is operated in the data that do not have a potential of violating SSP. The processes i-insertion and a-insertion do not operate in this set. The process u-insertion is found in the word-formations of only the stem-forms of 4 stems. Making calculation, the 4 stems of 33 stems within a percentage equals 12.12%. This number of stems that exhibit the vowel insertion and percentage is less than what was found in set of stems that has SSP potential violation, (i.e., 7 stems of 27; hence, 25.9 %). Thus, it can be seen that the set of data that has a potential violation for SSP displays u-insertion more than the set that do not have this potential. This means that violating SSP is a trigger for u-insertion and the other vowel insertions. Nonetheless, in the whole data, (i.e., the 60 stems), the total percentage of vowel insertion is 18.33 % as the word-formations of mainly 11 stems display vowel insertions.

ii. Other processes that contribute in resolving the CVCC are observed. However, because of their clear relationship with the glottal stop they are discussed later (see the realizations in 1 in table 4.4 above).

From these observations, it is concluded that u-insertion is the most distributive in the classical era and presumably the oldest in emergence. That i-insertion and a-insertion are operated mainly in the set of data that has the potential of violating SSP is taken as evidence that the two processes are younger in terms of the emergence. It also sustains that violating SSP is the trigger for their emergence. On the other hand, that u-insertion is found breaking up the final –CC, whether this CC has a potential to violate SSP or not, demonstrates that the vowel insertion as a repair strategy in its goal is not limited to avoiding the violation of SSP. Rather, its operation in the set of data that does not have the risk of violating SSP is taken in this study as a substantiation that proves that the emerged epenthetic vocalic in the earliest era was targeting all types of final –CC in CuCC roots. However, because of the noticed differences in the number of roots in which the vowel insertion is operated it is concluded that avoiding the violation of SSP was probably the beginning that induced phonology to fight the syllabic innovation. Yet, it has been argued that phonology is manufactured to create diversity not uniformity. Thus, since the restrain to SSP is a new development in Arabic it is anticipated that the modern Arabic dialects would exhibit two types of grammars; one that displays the new development and other that preserves the non-restraining to SSP. As will be seen when discussing the findings of the modern data, this anticipation is met in the

investigated modern Arabic dialects. IBA, KħA and MMA restrain to SSP whereas ECA does not.

On the other hand, since CuCC roots are the type of CVCC that was avoided first through the vowel insertion repair strategy, it is assumed that CuCC is the more dis-preferred than the other types of CVCCs. Yet, a notification should be made; there is one stem-form that was found displaying a-insertion in CaCC stems, (i.e., /ʃajʔ-V/ "thing"). However, I overlooked it here because the stem-form that displays a-insertion is documented in Alkhatiib's dictionary only once even though the stem "thing" has 278 stem-form occurrences in the Qur'an. The questioned surface of this word is [ʃaj**a**ʔ-a-n]. Even if it turns that this surface is correct, the conclusions that are formed above do not change. However, the correctness of this surface may be taken as evidence for two things. Firstly, that CaCC is the next target for phonology. Secondly, it confirms that phonology employs a copy-insertion of the root-vowel to resolve the innovation as a first strategy. This gives the indication that when CiCC turns come, phonology will, most probably, starts with a copy-insertion of the front root-vowel to prevent CiCC from surfacing as a resolution strategy. Accordingly, based on this assumption, three phonological environments will be supplied with the epenthetic vowel /i/, two with the epenthetic vowel /a/ and only one environment with the vowel /u/. This assumption is formed on the basis that even though u-insertion is the oldest but its distribution appears to be restricted to CuCC roots in contrast to the younger processes a-insertion and i-insertion which both operate in word-formations of CuCC roots. In addition, a-insertion is presumably going to operate in CaCC stems, whereas i-insertion is presumably going to operate in CaCC and CiCC stems.

Substitution

In previous section, it was noticed that the resolution of CuCC stems did not mainly involve processes of insertion. Rather, the processes i-insertion and a-insertion were joined with a vocalic substitution process that targeted the root-vowel of CuCC stems. This vocalic substitution has the target of substituting the root round vowel /u/ to either [i] or [a]. These vocalic substitutions, (i.e., a-substitution and i-substitution) have been argued that they head the insertion of [i] and [a] to prepare the phonological environment for an epenthetic vowel. Another finding was that a-substitution is operated in one example of CiCC roots that belongs to the set of data that has the potential to violate SSP. However, no vowel insertion was followed in that one example. This means that the substitution process was operating in another CVCC root type. Hence, phonology was not mainly targeting the round root-vowel in CVCC roots but seemingly was targeting all the root-vowels of the monosyllabic roots. These

findings sustain several conclusions, firstly is that there is ordering that phonology is following in terms of which process of the two heads the other. It also confirms that the substitution process is the first implemented process. Based on these findings, I argue that phonology was targeting vowel harmony from this ordering procedure. However, the degree of harmonizing that is being targeted is a question here since clearly phonology is not after a complete harmonizing. This is clear because, firstly, phonology follows the process of a-substitution with either a-insertion or i-insertion. Secondly, because phonology does not always substitute the round root-vowel; rather, as can be seen from the data u-insertion is operated as a first selection and it is operated in this early stage more. Hence, the substitutions are added as a way to increase the diversity.

The set of data that does not have a potential to violate SSP has also one root that displays a-substitution. In contrast to the expectation, this a-substitution process was noticed in a word-formation of a CiCC root not a CuCC root. This means that the expansion of the a-substitution has already begun in the CiCC roots to prepare them for the vowel insertion. The word "salt", which is underlyingly /milħ-u-n/, has two surfaces in the Qur'anic readings, these are, [milħ-u-n]≈[malħ-u-n]. This sustains the conclusion that a-substitution is older in the emergence than i-substitution which was limited to CuCC in the seventh century.

A need for reasoning what phonology was doing arises here. If phonology had mainly the target of preventing the syllabic complexity that Arabic phonology is threaten with, due to the loss, then why coming up with a resolution that involve procedures which, assumingly, will lead to create different kind of complexity? To explain, it would have caused less efforts and formed less complexity if phonology inserted always a copy vowel of the root in the CVCC roots. Hence, forming only CV_iCV_iC, where the two V_i in the new structures are the same vowel in terms of the phonetic value. If phonology did this, it would have needed only the insertion of a vowel and keeping an eye on its phonetic value to match the root-vowel. Operating in this way means that phonology makes less effort and would end most probably with creating uniformity, (i.e., one systematized grammar) in particular if the vowel insertion operated in all CVCC roots types. Conversely, implementing the substitution process for the root-vowel in the resolution creates complexity that ends with diversity, (i.e., systematized grammars) in particular if selectivity is operated in terms of when the vowel insertion is operated in CVCC stems and which vowel should be inserted. This implementation means that phonology has to make more effort not only in creating systematized grammars but also in keeping an observant eye so that these grammars *remain* systematized and *continue* creating systematized grammars. Since phonology is choosing the way that requires more

114

effort then, as mentioned before, phonology is *manufactured* to create diversity not uniformity. The diversity that is exhibited in the modern Arabic dialects sustains that phonology is not after uniformity. This will be clearer when observing the structures of the four Arabic dialects.

On the other hand, consider the grammar of SCA which Hamid (1984) introduces. The SCA data display a systematized grammar that simplifies CVCC stem-forms so that they realize within less complex syllable types. The less complex syllabic realizations required more and different procedures from phonology and led to a complexity. Therefore, externally, it appears as if phonology was resisting complexity through complexity. However, considering the types of complexities, (i.e., the formed and the resisted), it might be concluded that phonology is not forming complexity as thought. The type of complexity which is being resisted is syllabic complexity whereas the type of complexity that is formed is lexical complexity as can be seen from Hamid's data. Thus, I think that whereas the syllabic complexity is a complexity for the internal system of the Arabic language, the lexical complexity is simplicity for the system of this language. Therefore, it seems that phonology by forming lexical complexity through the resolution of syllabic complexity is forming the simplicity for the internal system of Arabic.

Stems with glottal stop

Since the stems with the glottal stop displayed idiosyncrasy in the set of data that has a potential of SSP violation, it was given an attention in the set of data that does not have a potential of SSP violation. In this set, which consists of 33 roots, there are 5 roots with an underlying glottal stop; 3 are of the type CVCʔ and 2 of the type ʔVCC. Stem-forms and inflected-forms of CVCʔ appear in table 4.5a whereas in table 4.5b stem-forms and inflected-forms of ʔVCC are given. The highlighted pausal forms are those that appear in Alkhatiib's dictionary whereas the others are the ones that are formed based on the rules of SA. The exclusion for this is the italic in the pausal forms cell of example 2.

N	Word	Contextual forms	Pausal forms
1	"Thing" /ʃajʔ/	Nom: [ʃajʔ-u-n]≈**[ʃaj ʔ-u-n]**≈ [ʃajj-u-n] Gen: [ʃajʔ-i-n]≈**[ʃaj ʔ-i-n]**≈ [ʃajj-i-n] Acc:[ʃajʔ-a-n]≈**[ʃaj ʔ-a-n]**≈ [ʃajj-a-n]≈[ʃaj-a-n]≈*[ʃajaʔ-a-n]*[4]	NOM: [ʃajʔ-u-n]→[ʃajʔ] GEN: [ʃajʔ-i-n]→[ʃajʔ] ACC: [ʃajʔ-a-n]→[ʃajʔ-aa] NOM: [ʃajj-u-n]→[ʃajj] ≈[ʃajj-u^R]≈[ʃajj-uˋ] GEN: [ʃajj-i-n]→[ʃajj]≈[ʃajj-i^R] ACC: [ʃajj-a-n]→[ʃajj-aa] NOM: **[ʃaj ʔ-u-n]**→[ʃaj]≈[ʃaj-u^R]≈[ʃaj-uˋ]≈ [ʃajj-uˋ]≈[ʃajj]≈[ʃaj^R]. GEN: **[ʃaj ʔ-i-n]**→[ʃaj]≈[ʃaj-i^R]≈ [ʃajj-i^R]≈ [ʃajj] ACC: **[ʃaj ʔ-a-n]**→[ʃaj-aa]≈[ʃajj-aa] ACC: *[ʃajaʔ-a-n]*→ *[ʃajaʔ]*
2	"Part" /ʒuzʔ/	NOM: [ʒuzʔ-u-n]≈[ʒuz*u*ʔ-u-n] ≈[ʒuzz-u-n] ACC: [ʒuzʔ-a-n]≈ [ʒuz*u*ʔ-a-n] ≈[ʒuzz-a-n]≈[ʒuz*u*w-a-n][5] ≈[ʒuzV^G-a-n][6]	NOM: [ʒuzʔ-u-n]→[ʒuzz]≈[ʒuzz-uˋ]≈[ʒuzz-u^R] NOM: [ʒuzʔ-u-n]→[ʒuzʔ] NOM: [ʒuz*u*ʔ-u-n]→[ʒuz*u*ʔ] NOM: [ʒuzz-u-n]→[ʒuzz]≈[ʒuzz-uˋ]≈[ʒuzz-u^R] ACC: [ʒuzʔ-a-n]→[ʒuzz-aa]≈[ʒuzʔ-aa] ACC: [ʒuz*u*ʔ-a-n]→[ʒuz*u*ʔ-aa] ACC: [ʒuzz-a-n]→[ʒuzz-aa] ACC: [ʒuz*u*w-a-n]→[ʒuz*u*w-aa] ACC: [ʒuzV^G-a-n]→ *[ʒuzV^G-a]*
3	"Warmth" /difʔ/	NOM: [difʔ-u-n]≈[diff-u-n]≈[dif-u-n]	[difʔ-u-n]→[diff]≈[dif]≈[dif-uˋ]≈[dif-u^R] [difʔ-u-n]→[difʔ] [diff-u-n]→[diff] [dif-u-n]→[dif]≈[dif-uˋ]≈[dif-u^R]

Table 4.5a: The word-formations of CVCʔ roots

The realizations that appear in the table 4.5a are selected so that it captures all types of the word-formations of CVCʔ roots that were found in the holy text (see appendix 2 for more realizations). Note that root-vowel differs in the three examples above to /a/ in (1), /u/ in (2) and /i/ in (3). These different quantities for the root-vowel give the opportunity to find out any possible relationship between surfacing the glottal stop and the nucleus of a syllable. Another observation regarding the data is that the three roots appear in the holy text indefinite and only in the stem-forms. Thus, the contextual and pausal realizations that were found are for only the indefinite stem-forms of the investigated CVCʔ roots. The main findings that are noticed are:

i. All underlying CVCʔ roots have contextual and pausal word-formations that display ʔ-deletion and a compensatory lengthening process that cause a preceding consonant to lengthen. Hence, the base in these word-formations which underlyingly is CVC$_i$ʔ surfaces as CVC$_i$C$_i$ in one of their pausal realizations.

ii. All underlying CVCʔ roots have contextual and pausal word-formations that surface the glottal stop in one their pausal realizations.

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[4] The last italic stem-form appeared only once in the dictionary as an articulation even though this word has 278 occurrences in the holy text.

[5] This articulation is classified as an articulation of a ʃawaað reading.

[6] This articulation is classified as dˤaʕiif "weak reading".

iii. Each CVCʔ stem in table 4.5.a has a pausal realization in which the vocalic marker undergoes *Rawm* V^R and *ʔishmaam* uˑ (see chapter one and two).

iv. Two vocalic insertions are noticed in the word-formations of CaCʔ and CuCʔ roots. The vocalic insertions display vowel harmony. The stem-form of CaCʔ root surfaces as [ʃaj**a**ʔ-a-n] which displays a-insertion whereas the stem-form of CuCʔ root has the following two surfaces which both display u-insertion; [ʒuz**u**ʔ-a-n] and [ʒuz**u**w-a-n]. The surfaces, [ʃaj**a**ʔ-a-n] and [ʒuz**u**ʔ-a-n] sustain the phonemic state of the glottal stop in the classical era in the sense that the vocalic insertion is operated even though /ʔ/ is part of the underlying stem. Hence, the glottal stop is treated by some speakers like the other underlying consonantal phonemes. Conversely, the surface, [ʒuz**u**w-a-n] is significant because of the gliding of the glottal stop which either have preceded or followed the u-insertion. This gliding of a consonant did not appear in the data except in this one realization which is classified as ʃawaað reading. This classification reduces the authenticity of this articulation for /ʒuzʔ-a-n/ as a stem-form that was produced in the seventh century. Thus, there is a possibility that this surface was produced in later centuries. Nonetheless, as far as I know, the gliding of the glottal stop is a phenomenon in some Qur'anic readings, though I do not know its extent. Yet, the existence of this phenomenon displays that the phonemic state of the glottal stop in the classical era is sustained for some Arabs but not all as this gliding is presumably another strategy that targeted the phonemic state of /ʔ/.

v. Another significant surface is [ʒuzV^G-a-n], which is classified as dˤaʕiif "weak". This classification reduces highly the possibility that this surface was realized in the seventh century. Nonetheless, the symbol V^G refers to the intermediate glottal stop (see chapter one which introduces this segment and the argument that there is glottalization process).

vi. The stems in (1) and (3) have a pausal surface that shows that the glottal stop might be deleted without being compensated [ʃaj] and [dif].

vii. The stem in (1) exhibits contextually a phenomenon known as السكت *ʔal-sakt*. This is an interesting phenomenon that it is also related to the realization of the glottal stop. The reading form that is most known of this phenomenon is Ħamzah reading form. Notably, based on inspecting a recording for this reading form, *ʔal-sakt* is heard in surfacing the root-initial glottal stop. Hence, it is not restricted to root-final glottal stop. Descriptively, this phenomenon is a brief pausing in the articulation of a word that has a glottal stop. Hence, a hearer hears a word that is split in its articulation. I do not know the appropriate symbol that expresses this phenomenon within IPA. Thus, I express it by leaving two spaces between the glottal stop and the palatal /j/ in (1). The contextual data that display this phenomenon are boldfaced.

On the other hand, there are 2 roots of the 33 roots that are of the type ʕVCC, (see table 4.5b below).

N	The root	Contextual forms	Pausal forms
1	"Sister"/ʔuxt/	NOM.Indef: /ʔuxt-u-n/→[ʔuxt-u-n] ACC.Indef: /ʔuxt-a/→[ʔuxt-a]	[ʔuxt-u-n]→[ʔuxt] [ʔuxt-a]→[ʔuxt]
2	"Earth"/ʔardˤ/	Definite Acc: /ʔal-ʔardˤ-i/→ [l-ardˤ-i]	[l-ardˤ-i]→[l-ardˤ]

Table 4.5b: ʔuCC and ʔaCC roots

The following are the observations on the realizations of the word-formations of these roots:

i.   There were no comments about the realization of the glottal stop for the example in (1). Thus, I concluded that the underlying glottal stop in the different surfaced-forms surfaces in its typical phonemic state.

ii. The realizations of the initial-glottal stop in (2) are connected to the phonological context of realization, (i.e., the phonological environment that precedes the word and the position of word-realization, that is, pausal or contextual). Alkhatiib also mentions in only one position (2002: vol.1. p. 174) that Hamzah has two pausal forms for this word. The first exhibits السكت ʔal-sakt phenomenon whereas the second exhibits deletion for the glottal stop.

The conclusion that was deduced from the observations that were made on the whole data is that, those data with a glottal stop are special data. This is because they display a sound change in which a consonant gradually loses the power of a phoneme to be something less.

4.3.1.3 Overall

Generally, the findings that were discovered have led to form conclusions and generalizations about the data of the seventh century.

i. The u-insertion that is operated in some CuCC roots in the seventh century is the origin of the wide-spread modern epenthesis process.

ii. The u-insertion was restricted to the CuCC roots.

iii. The u-insertion appears in both the set of data that has a potential of SSP violation and the set that does not. The percentage of u-insertion occurrence in the first set is 25.9 %, whereas the percentage of u-insertion occurrences is 12.12 % in th second set. In total, the process u-insertion was found in 18.33 % of the whole investigated data.

iv. There are as well a-insertion and i-insertion which are less distributive. The process a-insertion was found in 2 stems possibly 3; hence, the percentage of a-insertion is at most 5 % in the whole data. The set with the potential SSP violation has 2 stems that display a-insertion whereas the set that does not has a possible one avoidances

for consonant cluster. The process i-insertion was found in only 1 stem; hence, its percentage in the whole data is 1.66 %. This 1 stem is one of the stems that are categorized as the set that has potential to violate SSP.

v. The process u-insertion is a strategic resolution to resolve the novelty of CVCC syllable type within the convenient of a one-step action whereas a-insertion and i-insertion are strategic resolutions with at least two steps in the seventh century.

vi. The glottal stop is a phoneme that was targeted by phonology in the seventh century with the goal of changing its phonemic state in Arabic phonology. The strategies were used to achieve this goal are, ʔ-deletion and its compensatory lengthening and gliding of /ʔ/. Applying these strategies was companied with a side-effect, (i.e., introducing the superheavy syllable type CVCC in Arabic syllabic inventory). The intermediate glottal stop, which in this study is argued to be a new phoneme that is developed due to the sound change that is affecting ʔ, indicates that the process glottalization of vowels was another strategy.

vii. Notably, there was no mentioning for the case metathesis in the Qur'anic readings or in the commentary about these readings. As said before, Sibawaih (148/180 A. H. - 765/796 C.E.) documents in his book and specifies that it is of the type nominative /u/ and genitive /i/ metathesis. Therefore, it is concluded that the case metathesis was a resolution that was employed by phonology in the eight century not the seventh century.

viii. The first nucleus of most 3Pers pronominal suffixes exhibits relationship with the short vocalic case markers. The underlying vowel is found surfacing as /i/ when these suffixes attached to genitive nouns and surfacing as /u/ when attached to nominative and accusative nouns. Because /u/ surfaces in more phonological environments, the round /u/ is the assumed underlying vowel in these suffixes. This phenomenon appears in both sets of data that were discussed without displaying differences. Thus, it is introduced in this section within the examples below.

2a. 3Pers.Sing.Masc
[bi-siħr-**i**-h*i*] "with his magic.GEN"
[fa-ħukm-**u**-h*u*] "then his judgment.NOM"
[fadˤl-**a**-h*u*] "his bounty.Acc"

2b. 3Pers.Dual
[bi-siħr-**i**-h*i*maa] "with their.dual magic.GEN"
[ʕilm-**u**-h*u*maa]   "their.dual knowledge.NOM"

2.c 3Pers.Plur.Masc

[siħr-**i**-h**i**m]   "their.Plur.Masc magic.GEN"

[sˤidq-**u**-h**u**m] "their.Masc truth.NOM"

[sˤidq-**a**-h**u**m] "their.Masc truth.ACC"

    As can be seen above, the phonetic value of the nucleus of these suffixes, (boldfaced and italic), always manifests a feature possessed by the surfaced case marker (boldfaced and underlined). When a noun is marked by nominative or accusative markers the nucleus of the suffix has the feature back. In contrast, the nucleus of the suffix surfaces as [i] instead of the underlying /u when the noun is marked by the genitive case /i/ /. Hence, it displays complete assimilation. However, observe that there are slots that are missing in the above examples, (e.g., the 3Pers.Dual attached to an accusative noun). This missing is because of a short in the collected data. Yet, based on SA, when the 3Pers.dual is attached to accusative noun the surfaced nucleus in this suffix is /u/. Another short in the collected data is that it contains the 3Pers.Plur.Fem mainly attached to a nominative noun, (e.g., [rizq-**u**-h**u**nna] "their.Fem provision.Nom") which surfaces /u/. However, again based on SA the same vowel harmony is observed between the case inflection and the nucleus of this suffix. Therefore, when being attached to an accusative noun the suffix /-h**u**nna/ surfaces as [-h**u**nna] whereas when being attached to a genitive noun it surfaces as [-h**i**nna]. The only 3Pers that does not display this vowel harmony is the 3Pers.Sing.fem as it always surfaces as [-haa].

ix.   A contradictory was found between a generalization that was found enclosed in Alkhatiib's dictionary and a finding. This is the generalization:

<div dir="rtl">قال ابن جني: ((وحكى أبو الحسن عن يونس أنه قال: ما سمع شيء في فُعْل إلا سُمِع فيه فُعُل)).</div>

(Alkhatiib's 2002 dictionary, vol.7: 90)

Ibn ʒinnii said: "Abuu Al-ħasan narrated citing Yuunus that nothing was heard of

fuʕl that was not heard [pronounced] as fuʕ**u**l". [My translation, FA]

    In another words, what the generalization is saying is that all CuCC roots have two realizations, these are fuʕl and fuʕ**u**l; hence, CuCC and CuC**u**C. As far as what have been found, it can be seen that this generalization is an overgeneralization. This study tested 20 CuCC roots and found that only 11 roots of these 20 exhibit the process u-insertion. Thus, two claimed realizations appear in mainly 55 % of the investigated CuCC data. Nonetheless, upon checking the live period which Yuunus, whom this generalization is attributed to, it was found that he lived during 94/182 A.H. -713-798 C.E. The documentation also informs that Yuunus Ibn Habiib was one of Sibawaih's tutors. Thus, this generalization was established in

the eight century. Still, there is a good possibility that we are not dealing with an overgeneralization as it might be that u-insertion in the eight century was highly productive contrasting in this with the seventh century. Nonetheless, more information about Yuunus Ibn Habiib's generalization was not attainable because Alkhatiib unfortunately does not provide his source for the information which is uncommon of him.

4.3.2 The data of the modern era

In this section, observations, conclusions and generalizations about each of the investigated four modern Arabic dialects are provided. There are five headings, these are, IBA, ECA, KħA, MMA and overall. The overall section outlines the main discussed points about the vowel insertion and the realization of CVCC syllable type in the modern era of the Arabic language.

4.3.2.1 IBA

The collected data in appendix number 3 are from the IBA native speakers. Appendix 3 contains three tables. Each of these tables contains the data that is collected for CaCC, CuCC and CiCC stems. In this section, no subsections are offered. However, specific organization is followed in presenting the material. The main observations about the CVCC syllable type in this dialect are presented first. These observations are divided to those that are on stem-forms and those that are on inflected-forms. The conclusions and the basic generalizations about the grammar of IBA, which the analysis in chapter five depends on, are introduced at the end.

Starting with the stem-forms, the observations are:

i. The 60 CVCC stems were found surfacing as CVCVC (55 realizations), CVCV (2 realizations), CVVC (4 realizations), CVV (1 realizations), CVC (1 realization) and CVCC (1 realization). Therefore, in total 63 stem-form surfaces were obtained for the 60 stems.

ii. 55 stems of the monosyllabic 60 CVCC stems surface as disyllable stems of the kind CVCVC because of vowel insertion. Hence, the percentage of vowel insertion is 91.66 % in IBA. Only 1 stem surfaces as CVCC; hence, the percentage of adopting the innovation CVCC in IBA based on the collected data is 1.66 %.

iii. The vowel insertion is observed in 17 stems of CaCC stems type. The inserted vowels are /a/ in 4 stem-forms and /i/ in 13 stem-forms.

iv. All CuCC stems have a stem-form that displays a vowel insertion. It was found that 6 stem-forms surface as CiCiC, 12 as CuCuC and 2 as CuCiC.

v.   The total amount of CiCC stems that display insertion is 18 stem-forms. 17 stem-forms of these 18 display the epenthetic vowel /i/. Only 1 stem-form displays the epenthetic /u/.

vi.   Root-vowel substitution was found in the stem-forms as following: CaCC (only 4), CiCC (only 2) and CuCC (only 6). In case of CaCC, these are [zooʒ] "twosome", [wiʒ*i*h] "face", [raas] "head" and [ʃii] "thing". In CiCC stems, these are [biir] "well" and [ðiib] "wolf". In CuCC stems, these are [ħis*i*n] "beauty", [sˤin*i*ʕ] "manufacture", [ħiz*i*n] "grief", [wis*i*ʕ] "capability", [dih*i*n] "fat" and [ʔix*i*t] "sister". Hence, the percentage of root-vowel substitution in IBA is 20 % in the whole set of data. This includes both the data that exhibit insertion and those that do not. Worth mentioning; however, the stem /zawʒ/ has two stem-forms; one does not display the root-vowel substitution [zaw*i*ʒ] "husband" and other displays it [zooʒ].

vii.   All CVʔC stems surface as CVVC in IBA.

viii.   The stem /ʃarr/ "evil", which has an underlying geminate, surfaces in its stem-form as [ʃar].

ix.   The stem with a middle labial-velar glide /w/, that is, /zawʒ/ "spouse" and "twosome" in CA[7]) surfaces in IBA as /oo/ when meaning "twosome" whereas when meaning *"husband"* the glide /w/ was found surfacing followed with an epenthetic /i/ that breaks up the cluster. Hence, in IBA there are two stem-form realizations for the underlying /zawʒ/. This output-split for /zawʒ/ has a semantic motivation. To explain, the first output for /zawʒ/ in IBA is [zaw*i*ʒ], which in IBA semantically means "husband". The meaning "husband" is a specification for "spouse", a more general meaning as it refers to either *husband* or *wife*[8]. The second realization is [zooʒ] which has the meaning "twosome" or in other illustrative words 'two of the same kind'. The lexical meaning "twosome" is among the lexical meanings of /zawʒ/ in the classical era. Thus, IBA is preserving the classical lexical meaning "twosome" through a new

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[7] It also has the lexical meaning of "couple" or "the two" which is preserved in some more analytical Arabic dialects (e.g. MMA and Libyan Arabic) in realizations such as [zuuz] and [zuz]. These realizations express the duality instead of the known dual morphemes /-ajn/ and /-aan/ which Arabic nominal words are inflected with in CA, SA and MSA. The less analytical Arabic dialects express duality in nominal words only through one morpheme. For instance, in KħA it is expressed through the morpheme /-een/ whereas in ECA it is expressed through /-iin/.

[8] Worth mentioning, in MSA the stem /zawʒ-V/ is used to refer to *husband*. The meaning *wife* is referred to through [zawʒ-at-V]. Thus, the specification for the classical meaning appears in the modern standard language and not restricted to the dialects. Notably, the morphological machinery is the one that is generating the new specification by utilizing the feminine morpheme [-at-]. Hence, today we have [zawʒ-V] "husband" and [zawʒ-at-V] "wife" just as we have [kaatib-V] "writer.Masc" and [kaatib-at-V] "writer.Fem". Interestingly, some still may consider [zawʒ-at-V] a non-grammatical structure even though it is highly used among the laterite people.

realization [zooʒ]. This new realization displays surfacing the long monophthong /oo/ as a root-vowel instead of the underlying /a/. Notably as well, the glide does not surface in this output, which indicates that it underwent deletion and the long /oo/ is a result of not only substitution but also a process of compensatory lengthening.

x.   The stem with a final glide /ɣalj/ "Boil" surfaces as [ɣali]. Hence, instead of the semi-vowel /j/ a vocalic nuclei surfaces. In the stem-form, this is the short front /i/.

xi.   The three CVCʔ stems exhibited different realizations in IBA. The stem /ʃajʔ/ "thing", which has the glide /j/ and a glottal stop /ʔ/, surfaces as [ʃii]. Hence, the surfaced root-vowel is the long phonemic monophthong /ii/. The stem /ʒuzʔ/ "part" surfaces as either [ʒuzʔ] or [ʒuz*u*w]. The realization [ʒuz*u*w] displays insertion for u and substitution for ʔ. In contrast, the realization [ʒuzʔ] displays not only surfacing the glottal stop but also the superheavy CVCC. This is the only realization that was found in the IBA data. I presume that it is borrowed from SA. The stem /difʔ/ "warmth" surfaces as either [difu] or [dif*u*w]. The realization [dif*u*w] is similar to [ʒuz*u*w]; the only distinction is the root-vowel. Whereas [dif*u*w] belongs to the CiCC underlying stems, [ʒuz*u*w] belongs to the CuCC stems. The realizations show that the root-vowel is preserved as they are surfacing the underlying vowels; /i/ in [dif*u*w] and [u] in [ʒuz*u*w]. I think that analogy with [ʒuz*u*w] had the impact on the formation of [difuw]. Thus, I assume that the substitution of the glottal stop with the labial-velar glide preceded the insertion of /u/ in [dif*u*w]. The realization [difu] is assumed to be a later development in which the labial-velar is deleted.

Moving to the inflected-forms, the observations are:

i.   The epenthetic vowel surfaces only when the attached suffix is consonant-initial. Hence, only when the stem is attached to either [-na] "1Pers.Plur.Masc", [-kum] "2Pers.Plur", [-ʧan] "1Pers.Plur.Fem", [-ha] "3Pers.Sing.Fem", [-hum] "3Pers.Plur.Masc" or [-hin] "3Pers.Plur.Fem".

ii.   In terms of the value of the epenthetic vowel, I always transcribe [i], [u] and [a]. However, it is observed that the phonetic value of the epenthetic vowel in some words is neither [i] nor [u]. I transcribed what is nearer in such cases.

iii.   It is observed that the same epenthetic vowel surfaces in both a stem-form and inflected-forms of a stem. However, notably there are exceptions for this in CuCC stems and CiCC stems. The phonetic value of the epenthetic vowel differs in 8 CuCC stems and only in 1 stem of CiCC. Notably, in case of the 8 CuCC stems, there are 4 stems exhibit the insertion of /u/ in the stem-forms and manifest the front /i/ in at least

123

1 inflected-form of their paradigms, (i.e., /mulk/, /rukm/, /sˤulħ/ and /ʒuzʔ/). The vice versa appears in the other 4 CuCC stems, as in these /i/ insertion is exhibited in the stem-forms and in at least 1 inflected-form the epenthetic vowel /u/ is exhibited, (i.e., /ʔuxt/, /sˤubħ/, /ʕuðr/ and /sˤunʕ/). In the CiCC stem, the underlying stem /kibr/ "vanity" surfaces as [kib*i*r] and [kib*i*r-na] in its stem-form and 1Pers.Plur inflected form. In its rest inflected-forms, which exhibit vowel insertion (i.e., inflected with [-kum] "2Pers.Plur", [-ʧan] "1Pers.Plur.Fem", [-ha] "3Pers.Sing.Fem", [-hum] "3Pers.Plur.Masc" or [-hin] "3Pers.Plur.Fem"), the surfaced epenthetic vowel is [a].

iv. The CVʔC stems surface as CVVC even in the inflected-forms.

v. The inflected-forms of the stem-form [zaw*i*ʒ] display the same base structure. The inflected-forms of [zooʒ] also display the same base structure. Thus, the labial-velar followed with the front vowel surface in the paradigm of [zaw*i*ʒ] and the long monophthong [oo] surfaces in the paradigm of [zooʒ] (see the cell 7 in table 3.1 in appendix 3).

vi. The base with the final underlying palatal glide /j/ /ɣalj/ "boil" displays different realizations for the palatal /j/ based on the suffix structure that is attached to. It surfaces /j/ when being inflected with a vowel-initial suffix, (e.g., [ɣalj̪-ak] "boil.2Pers.Sing.Masc"). When inflected with a consonant-initial suffix a long front nucleus /ii/ surfaces instead of /j/, (e.g., [ɣal*ii*-na] "boil.1Pers.Plur").

vii. The stem-form [ʃii] "thing" has the root /ʃajʔ/. It is noticed that the base surfaces with front short root-nucleus when being inflected with vowel-initial suffix, (i.e., [ʃijj-i] "1Pers.Sing", [ʃijj-ak] "2Pers.Sing.Masc", [ʃijj-iʧ] "2Pers.Sing.Fem" and [ʃijj-a] "3Pers.Sing.Masc"). Thus, the underlying root-palatal surfaces in those inflected-forms with vowel-initial suffixes. When being inflected with consonant-initial suffix, the root-nucleus /a/ surfaces as long front /ii/, (i.e., [ʃii-na] "1Pers.Plur", [ʃiiʔ-kum] "2Pers.Plur.Masc", [ʃii-ha] "3Pers, Sing.Fem", [ʃii-hum] "3Pers.Plur.Masc" and [ʃii-hin] "3Pers.Plur.Fem". Notably, the root-palatal surfaces in those inflected-forms in which the nucleus is short but not in those with long vowel nucleus. This indicates that the long vowel nucleus is due to compensatory lengthening for the deletion of the palatal. However, note that the inflected-forms are not part of the vocabulary of IBA. This presumably explains surfacing the glottal stop in [ʃiiʔ-kum] "2Pers.Plur.Masc" as most probably it is due to the second language acquisition of SA.

viii. The underlying root /difʔ/ has two stem-forms in IBA, (i.e., either [difu] or [dif*u*w]). When being inflected with a vowel-initial it surfaces as [dafw-i]≈[dufw-i]

"1Pers.Sing", [dafw-ak] "2Pers.Sing.Masc", [difw-itʃ] "2Pers.Sing.Fem" and [difw-a] "3Pers.Sing.Masc". When inflected with a consonant-initial it surfaces as [dafuu-na] "1Pers.Plur", [difuu-kum] "2Pers.Plur.Masc", [difuu-tʃan] "2Pers.Plur.Fem", [difuu-ha] "3Pers.Sing.Fem", [difuu-hum] "3Pers.Plur.Masc" and [difuu-hin] "3Pers.Plur.Fem". It can be seen that the root-vowel is substituted in specific inflected-forms these are [dafw-i]≈[dufw-i], [dafuu-na] and [dafw-ak] whereas it is preserved in the others. There is no evidence that suggests that this substitution related to the initial component of the suffixes. On the other hand, notably, the glottal stop does not surface at all. Rather, what is observed is a gliding phenomenon. Observingly, the gliding results on substituting the glottal stop with a labial-velar. However, this labial-velar does not surface in all inflected-forms. The deletion of the labial-velar and the compensatory lengthening of the preceding /u/ occur mainly when the base is inflected with consonant-initial suffixes.

ix.   All the inflected-forms of the underlying /ʒuzʔ/ display only one realization that surfaces the glottal stop. This is contrast with the stem-form which has two realizations [ʒuz*u*w] and [ʒuzʔ]. However, the insertion of a vowel is operated mainly in the inflected-forms that are formed by attaching the base to consonant-initial suffix. Worth mentioning, the paradigm of this stem is among the stems that manifest different phonetic values for the epenthetic vowels (see 2 in table 3.2 in Appendix 3, and the observation iii above). In addition, it is observed that 3 of the inflected-forms manifest root-vowel substitution, (i.e., [ʒizʔ-i] "part.1Pers.Sing", [ʒiz*i*ʔkum] "part. 2Pers.Plur.Masc" and [ʒiz*i*ʔtʃan] "part.2Pers.Plur.Fem).

x.   The root-vowel substitution percentage increases when considering this process occurrence in the inflected-forms. The root-vowel substitution appears in 19 stem, hence, the total percentage becomes 31.6%. The new stems that display the root-vowel substitution only in the inflected-forms are those that are categorized to CuCC and CiCC stems. In case of CuCC, these are /ʒuzʔ/, /mulk/, /rukn/, /sˤubħ/ and /sˤulħ/. In case of CiCC, these are /difʔ/ and /qistˤ/. However, observing the paradigm of all the 19 stems shows that they do not always surface the new substituted vowel. Rather, some stems exhibited in the surface the root-vowel instead of the new vowel in one or more inflected-forms. The number of stems that exhibited always the new substituted vowels is 9 stems, (i.e., /biʔr/, /ðiʔb/, /duhn/, /wusʕ/, /huzn/, /husn/, /zawʒ/, /raʔs/ and /waʒh/). The number of stems that exhibited mixture vowels is 10 stems, (i.e., /qistˤ/, /difʔ/, /ʔuxt/, /ʒuzʔ/, /mulk/, /rukn/, /sˤubħ/, /sˤulħ/, /sˤunʕ/ and /ʃajʔ/. The stem /ʃajʔ/ is

the only stem that displayed mixture vowels that do not include the underlying root-vowel /a/ (see: vii in the inflected-forms observations).

xi. The inflected-forms of /ʃarr/ display surfacing the geminate consonants only when being inflected with vowel-initial suffixes. When being inflected with a consonant-initial suffixes only one consonant of the geminate surfaces.

xii. In relation to the pronominal suffixes, it is observed that IBA still has most of the CA morphological system. It lost the dual pronominal suffixes and the allomorph(s) of a suffix. Yet, in contrast to the other investigated modern diaects IBA still preserves the gender distinction in the category 2Pers.Plur and 3Pers.Plur. However, the contrast between the suffixes of IBA and SA display some differences. The lexical component of some suffixes are reduced or changed. An example for the change is the affrication in 2Pers.Fem in both the singular morpheme and the plural. In addition, some consonant-initial suffixes are surfacing as vowel-initial suffixes. The table 4.6 below provides the morphological system of IBA in contrast to SA's.

Person	IBA	SA	Gloss
1Pers	[-i]	[-i]≈[-ii]≈[ija]	Sing
	[-na]	[-naa]	Plur
2Pers	[-ak]	[-ka]	Sing.Masc
	[-itʃ]	[-ki]	Sing.Fem
	[-kum]	[-kum]	Plur.Masc
	[-tʃan]	[-kunna]	Plural.Fem
		[-kumaa]	Dual
3Pers	[-a]	[-hu]	Sing.Masc
	[-ha]	[-haa]	Sing.Fem
	[-hum]	[-hum]≈[him]	Plur.Masc
	[-hin]	[-hunna]	Plur.Fem
		[-humaa]	Dual

Table 4.6 the pronominal suffixes of IBA and SA

From these observations, the following conclusions and generalizations were made about the IBA grammar. Firstly, the monosyllabic nominal stems, whether CaCC, CuCC or CiCC do not surface in this dialect even if the final -CC cluster does not violate SSP. This observation makes us conclude that this dialect do not accommodate the superheavy CVCC syllable type among its syllabic inventories. In contrast the syllable type CVVC is accommodated within this dialect within words like [raas] "head". The accommodation and

non-accommodation of the two types of syllables is noticed in the different levels of the grammar, (i.e., the stem-level and word-level[9]).

Considering what has been established of knowledge about these types of syllables and the phonemic state of the glottal stop in the classical era, it is concluded that the processes that affect the realization of the glottal stop are adopted in the grammar of this Arabic dialect. In addition, this dialect has benefited from the repairs strategies of the classical era to resolve the innovation of CVCC in great extreme. Both the vowel insertion process and the root-vowel substitution are evident in IBA. Their operations in the different levels of the grammar display more systematic relationships between morphology, phonology and semantic. Even though the syntax is not tested in the examination, but the fact that the words are manifesting morpho-phonological differences suggest that there are syntactical consequences that affect the realization of these words in a context.

Nonetheless, the grammar of IBA refuses the complexity of CVCC but accommodate well CVVC. Therefore, based on observing the data, it is generalized that this dialect has a prosodic requirement that bans the realization of CVCC through employing several processes. The one realization of CVCC, (i.e., /ʒuzʔ/ "part") is overlooked on the bases of its non-functionality in the sense that it appears mainly in the stem-form of 1 stem. Notably, the inflected-forms of this stem do not display CVCC rather the vowel insertion is operated to ban its realization. Therefore, it is concluded that this 1 CVCC realization is a borrowing from SA.

Secondly, the vowel insertion is highly active in the grammar of this dialect and is systematic in surfacing the epenthetic vowel in words in both levels; stem-level and inflected-level. These observed characteristics of the epenthetic vowel justify the question whether the epenthetic vowels should be considered epenthetic synchronically. I have the impression that, from a synchronic perspective, they are not inserted anymore; rather they are part of IBA phonological abstract system. Hence, I think that they exist underlyingly.

The observed systematic appears in the morphology-phonology interface. For example, the role of morphology in operating and blocking a process is observed. For instance, the vocalic-initial suffix, in contrast to the consonant-initial suffix, blocks as can be seen below:

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[9] The expressions stem-level and word-level are defined in chapter five. But for clarification, word-level is referring here to the level in which the inflected-forms are shaped based on its prosodic requirement whereas the stem-level is responsible on shaping the stem-forms.

(3a) /siħr/→ [siħir]   "magic"
(3b) /siħr-a/→[siħr-a]   "magic.3Pers.Sing.Masc"
(3c) /siħr-hum/→[siħirhum] "magic.3Pers.Plur.Masc"
(4a) /ʃajʔ/→ [ʃii] "thing"
(4b) /ʃajʔ-a/→ [ʃijj-a]   "thing.3Pers.Sing.Masc"
(4c) /ʃajʔ-hum/→ [ʃii-hum] "thing.3Pers.Sing.Masc"

The examples in (3) display operating and blocking the vowel insertion whereas the examples in (4) display operating and blocking deletion and compensatory lengthening processes. Thirdly, the type of underlying consonant in realizing a specific surface is noticed in IBA.

The realization of three consonants is a worth of investigation within a bigger set of data that considers different phonological environments. These are the glottal stop, the palatal glide and the labial-velar glide. For instance, in terms of the stems with the glottal stop, it is found that the classical realizations CVVC instead of CVʔC. However, in IBA the CVCʔ was found in new realizations that did not exist in the classical data as can be seen in (5).

(5c) /difʔ/→ [difu]≈[difuw]   "warmth"
(5d) /difʔ + na/→ [dafuu-na] "our warmth"
(5e) /difʔ +a/→ [difw-a]   "his warmth"

Therefore, it is generalized that in IBA there is a prohibition in surfacing the glottal stop though this prohibition is dominated with a higher constraint that allows limited realization of /ʔ/. That there is a higher constraint in this dialect that allows ʔ to surface is evident from the realization of ʔ in some words which surface ʔ stem-initially and stem-finally.

In relation to the glides /w/ and /j/, it is observed that they get deleted and compensated when they are root-middle but not when they are root-final and root-initial (see v, vi, vii and viii observations on the inflected-forms and see the realizations of /waʕd/ "promise" in cell 2 in Appendix 3). The deletion and compensatory lengthening of middle-glides might suggest that phonology motivates reducing the glides environments, hence, that the glides are targeted phonemically. However, this suggested interpretation is falsifiable. This is because the evident phonological reduction of the glides is opposed with the evident phonological increase of the two glides as they surface in some of CVCʔ instead of the glottal stop (see vii and viii observations on inflection-forms). The extent in which these processes of reduction and increasing are active in the grammar is in need for more investigation. Nonetheless, it is concluded that the two glides are still effective phonemes in IBA. The sound change which they are undergoing is presumably intending reorganizing their surfaces. In other words, the sound change which the glides are undergoing motivates their distribution

not their phonemic state. Therefore, it is generalized that there is a ranking that organizes the surface of these two consonants in different levels in the grammar. As will be seen this generalization is recognized in the other investigated dialects.

The observations that are made on the root-vowel substitution do not permit me to make generalizations in terms of the reason behind the distribution of this process. It is witnessed in both stem-forms and inflected-forms. Those that display mixture phonetic values are of interest as these assumingly are not stable yet. Nonetheless, the motive of this process that is argued is still the same, (i.e., changing the lexical component of bases). IBA in contrast to KħA and ECA display high rate of operating this process.

Finally, the observations about /ʃarr/, which consists underlyingly of a geminate, show that IBA realizes in the stem-form the classical pausal form of CVC_iC_i. They also show that surfacing the geminate is restricted in the inflected-forms. Only those that are inflected with vowel-initial suffix surface the geminate. The final C_i does not surface when the stem is inflected with a consonant-initial suffix. Consequently, it is generalized that the superheavy CVC_iC_i surfaces as CVC_i in two levels of the grammar and as CVC_iC_i in only one level. The CVC_iC_i syllable type surfaces mainly in the word-level, whereas CVC_i surfaces in stem-level and word-level. Therefore, it is deduced that the final C_i still exists synchronically in the abstract organization of IBA.

4.3.2.2 ECA

The data that were obtained from Egyptian native speakers appear in Appendix 4. This section presents the observations and the conclusions. It also forms basic generalizations about the grammar of ECA that guide the analysis in chapter five.

Starting with the observations on the stem forms:

i. The 60 CVCC stems surface in ECA as CVCC (52 realizations), CVVC (6 realizations), CVC (2 realizations) and CVCVV (1 realizations). Thus, the whole collected amount of stem-forms is 61.

ii. 52 stems of the 60 stems surface as CVCC. Hence, in percentage, 86.66 % of the data surface in the stem-form as CVCC. These 52 stems are divided as following: 15 in CaCC stems, all CuCC stems and 17 in CiCC stems.

iii. CVVC syllable surfaces in 5 stems. These 5 stems are the 3 CVʔC stems (see viii below) and the 2 CVGC (see vi below). As can be seen, from vi, the underlying

/zawʒ/ "husband" has two CVVC realizations; [guuz] and [zuug], both has the meaning "husband". The realization [guuz] displays a long metathesis process.

iv. No vowel insertion was found in any of the stem-forms. Hence, there is no vowel insertion in the stem-level.

v. Root-vowel substitution was noticed in 9 stems; hence, it appears in 15% of the whole data. It was observed that only 3 CaCC stems display the substitution. These are: /raʔs/→[raas] "head", /zawʒ/→[guuz]≈[zuug] "husband" and /ʃajʔ/→[ʃiiʔ] "thing". In CuCC stems only 2 stem-forms display the root-vowel substitution; (i.e., /wusʕ/→[wisʕ] "capability" and /duhn/→[dihn] "fat"). The substitution is observed in 4 stem-forms of CiCC stems, these are, /milħ/→[malħ] "salt", /ðiʔb/→[diib] "wolf", /biʔr/→ [biir] "well" and /difʔ/→[dafaa] "warmth".

vi. The stems with underlying middle glides CVGC display in the surface glide deletion and a lengthened nucleus. For the underlying /zawʒ/ two realizations were found these are [guuz] and [zuug]. However, in contrast to IBA, the two realizations hold one meaning that is "husband". Yet, I have been informed by one of my informants that [guuz] can be used to mean "the two" but this is very rare. The realization [ʃiiʔ] was found for the underlying /ʃajʔ/. This realization shows that a root-vowel substitution has preceded the deletion of the glide. Worth mentioning, in contrast to /zawʒ/, the stem /ʃajʔ/ is not part of ECA vocabularies. Thus, I assume that the informant depended on her intuition for how a glide should surface in CVGC stems as the root has middle palatal /j/.

vii. The stem that has final glide /ɣalj/ "Boil" surfaces in ECA as [ɣalj].

viii. The three CVʔC stems surface as CVVC, these are, /raʔs/→[raas] "head", /ðiʔb/→[diib] "wolf", [biʔr]→[biir] "well".

ix. The three CVCʔ stems displayed different syllabic realizations. As mentioned above /ʃajʔ/ "thing" surfaces as [ʃiiʔ]. The stem /ʒuzʔ/ surfaces as [ʒuzʔ] whereas the stem /difʔ/ surfaces as [dafaa]. I was informed by one informant that /ʒuzʔ/ is not part of ECA vocabularies. The realization [dafaa] is argued to be a last development in which other outputs was realized for the same underlying /difʔ/. I assume that an output that display root-vowel substitution [dafʔ] was surfacing for a period of time. Later, the back vowel /a/ was inserted to break up the insertion; hence, [dafaʔ]. Finally, the output [dafaa] has been surfaced in which the glottal stop is deleted and compensated with lengthening the epenthetic vowel. This interpretation considers the vowel

harmony requirement and the state of the glottal stop that were recognized when discussing the data.

x.   The stem /ʃarr/, which has underlying geminate, surfaces as [ʃar].

xi. The stem /waʒh/ surfaces as [wiʃ]. The glottal fricative /h/ is deleted and the post-alveolar voiced fricative /ʒ/ is substituted with the post-alveolar voiceless /ʃ/.

Moving to the observations on the inflected-forms:

i.   Neither CVCC nor CVVC are surfaced in the ECA in the inflected-forms of the 60 stems.

ii. Morphology has important role in preventing the realization of the two superheavy syllable types as it supplies structures with vowel-initial suffixes. These vowel-initial suffixes are [-i] "1Pers.Sing", [-ak] "2Pers.Sing.Masc", [-ik] "2Pers.Sing.Fem" and [-u] "3Pers.Sing.Masc".

iii. When the morphology is incapable to supply the structures with vowel-initial suffixes phonology operates processes that prevent CVCC and CVVC from surfacing.

iv. The consonant-initial suffixes are [-na] "1Pers.Plur", [-kuu]≈[-kum] "2Pers.Plur", [-ha] "3Pers.Sing.Fem" and [-hum] "3Pers.Plur".

v.   The CVCC is avoided by vowel insertion when the morphology is incapable to supply a vowel-initial suffix. The paradigms of 54 stems display the vowel insertion; CaCC (17 stems), CuCC (all the 20 stems) and CiCC (17 stems). Hence, totally 90 % of the data displays the vowel insertion in the word-level.

vi. Shortening the nucleus of CVVC is the process that is employed to avoid this superheavy syllable type when the morphology is incapable to supply a vowel-initial suffix. It was noticed that 5 stems surface as CVVC in their stem-forms. However, observing the inflected-forms show that only 4 of these 5 display the shortening. This is because the collected data does not include the inflected-forms of /ʃajʔ/ as only its stem-form was attainable from the informants. All the stems CVʔC, which has the stem-forms CVVC (see viii above), surface when inflected with consonant-initial suffix as CVC. The same CVC is noticed in the inflected-forms of the stem /zawʒ/ "husband"; however, it is noticed that only the structure [guuz] that gets inflected. Notably, the other realization for /zawʒ/, (i.e., [zuug]) does not have inflected-forms. Nonetheless, this shorting process which occurs mainly in the inflected-forms retains the underlying root-vowel. For instance, the stem /raʔs/ surfaces in its stem-form as [raas] and in 3Pers.Sing.Fem infected-form as [ras-ha]. The 3Pers.Sing.Fem inflected-form of [guuz] is [guz-ha].

vii.   The phonetic values of the epenthetic are systematic in ECA. All the 54 inflected-forms with [-na] "1Pers.Plur" surface [i]. All the 54 inflected-forms with [-kuu]≈[kum] "2Pers.Plur" and [-hum] "3Pers.Plur" surface [u]. All the 54 inflected-forms with [-ha] "3Pers.Sing.Fem" surface [a].

viii.   In contrast to the stem-form, the underlying geminate of the stem /ʃarr/ surfaces in all its inflected-forms. It is noticed that when the morphology is incapable to supply a vowel-initial suffix the vowel insertion is operated by phonology to avoid the CVC_iC_i just like all other CVCC types.

ix.   1 stem displayed significance, this is, /waʒh/ "face". Whilst it surfaced as [wiʃ] in the stem form (see xi in the observations of the stem-forms), in all its inflected-forms the post-alveolar fricative /ʃ/ is doubled. For instance, [wiʃʃ-i] "face.1Pers.Sing" and [wiʃʃi-na] "face.1Pers.Plur". This lengthening for the voiceless fricative /ʃ/ is presumably a compensation for the deleted underlying root-consonant /h/. Nonetheless, it is noticed that the vowel insertion is operated regularly to break up the surfaced C_iC_i. Hence, the vowel insertion operates in the word-formations of /waʒh/ like the word-formation of /ʃarr/.

x.   The stem-form [dafaa], which has the underlying /difʔ/, showed that ECA has allomorphs for the vowel-initial suffixes. Firstly, instead of realizing the front [-i] which marks 1Pers.Sing, a palatal glide [-j] is observed; hence, [dafaaj] not *[dafaai]. Secondly, in 3Pers.Sing.Masc morphological category the surfaced structure was [dafaah] not *[dafaau]. The voiceless glottal fricative /h/ is surfaced to mark 3Pers.Sing.Masc instead of regular marker, (i.e., the round [-u]). Thirdly, when inflecting for 2Pers.Sing.Masc, which is in the rest 59 stems is marked by the morpheme [-ak], the inflected-from that was realized for [dafaa] is [dafaa-k]. Since notably all the realizations of the stem display lengthening for the final vowel /aa/, I concluded that ECA has [-ak] and [-k] as morphemic units that mark 2Pers.Sing.Masc. It is also concluded that ECA has [-ik] and [-ki] as markers for 2Pers.Sing.Fem as for this stem the inflected form realized as [dafaa-ki] contrasting in this with the whole collected data in this morphemic category which surface [-ik].

xi.   The pronominal suffixes of ECA in contrast to those of SA are presented in table 4.7. Among the differences that can be seen is that ECA has lost the dual pronominal suffixes, 2Pers.Plur.fem and 3Pers.Plur.Fem. In addition, consonant-initial suffixes are in ECA vowel-initial suffixes (i.e., 2Pers.Sing. Masc and 2Pers.Sing. Fem).

Person	ECA	SA	Gloss
1Pers	[-i]≈[-j]	[-i]≈[-ii]≈[ija]	Sing
	[-na]	[-naa]	Plur
2Pers	[-ak]≈[-k]	[-ka]	Sing.Masc
	[-ik]≈[-ki]	[-ki]	Sing.Fem
	[-kuu]≈[-kum]	[-kum]	Plur.Masc
		[-kunna]	Plural.Fem
		[-kumaa]	Dual
3Pers	[-u]≈[-h]	[-hu]	Sing.Masc
	[-ha]	[-haa]	Sing.Fem
	[-hum]	[-hum]≈[him]	Plur.Masc
		[-hunna]	Plur.Fem
		[-humaa]	Dual

Table 4.7 the pronominal suffixes of ECA and SA

The following conclusions and generalizations are formed about the grammar of ECA. Firstly, since the CVCC and CVVC are accommodated in the stem-forms but not the inflected-forms it is generalized that, there is a prosodic requirement that prohibits the realization of the two superheavy syllables in inflected-forms. To satisfy this requirement two phonological processes are operated only in the inflected-forms when morphology is disabled to provide a resolution that prevents the superheavy syllables. In addition, the accommodation of CVCC in the stem-forms means that ECA does not have a restrain for SSP violation in the stem-level. This non-restraining contrasts with the data of IBA which does not display a violation for SSP. These findings sustain the argument that the grammar changes by splitting up to grammars that accommodate an innovation and a grammar that does not.

Secondly, because the phonetic values of the epenthetic vowels are highly systematic it is concluded that synchronically they are part of the abstract grammar of ECA.
Thirdly, there is a substantiation that the glides in ECA, just like IBA are undergoing sound change. However, the two glides are not losing their phonemic state. Rather, the sound change which they are undergoing is argued to be motivating intending their distribution. The substantiation for this conclusion is that the glides surface root-finally and root-initially but not root-middle. The evidence is that the word-realizations of CVGC in contrast to those of CVCG do not surface whether in stem-forms or inflected-forms. For instance, contrast the realizations of /zawʒ/ "husband" with /ɣalj/ "boil". Also contrast the realizations of /zawʒ/ with those of the root /waʕd/ which is glide-initial as this presents another support. Thus,

root-initially and root-finally the glides surface by evidence. However, it is root-middle that seems that phonology is prohibiting the glides consonants from surfacing on. The degree of prohibition, however, needs to be attested through investigating more data in both dialects. Fourthly, the 3 CVʔC stems were found surfacing as CVVC in ECA. In addition, 1 of the three CVCʔ stems surfaces as CVCVV. These observations might lead to the conclusion that /ʔ/ in ECA is undergoing sound change that motivates ʔ reduction; hence, motivating the phonemic state of the glottal stop. However, this conclusion is wrong. This is because in contrast to IBA, KħA, MMA and presumably other Arabic dialects, in ECA the uvular /q/ is substituted with /ʔ/. In other words, the ECA phonology is strengthening the phonemic state of /ʔ/ by reintroducing it in the environments that underlyingly consist of /q/. For example, the word /qalb/ "heart" surfaces as [ʔalb] in ECA (see the cell 17 in table 4.1 in Appendix 4). The realization of the uvular in the modern Arabic dialects is of worth investigation. The uvular in IBA and KħA surfaces as /g/ whereas in MMA it still surface as /q/. I also know that it surfaces as velar /k/ in some Arabic dialects, (e.g., Jordanian Arabic). Nevertheless, I do not pursue the realization of the uvular in the modern dialects because there was no finding that suggests that the change that it is affecting the phonemic state of the uvular is related to the investigation of this study. However, the emphasis here is that the phonemic state is not a question in ECA as this dialect preserves the classical phonemic state of ʔ though its distribution differs. Another emphasis here is that this is another substantiation that confirms that the grammar change by splitting to those that encompass new innovation and others that encompass the preservation of the old feature. Notably, ECA preserves the phonemic state of ʔ in contrast to IBA and other Arabic dialects.

Fifthly, the observed resolutions of geminate in both the stem-form and inflected-forms of /ʃarr/ lead to concluding that the geminate does not surface in a stem-form. In addition, because the CVC_iC_i is avoided in the inflected-forms through vowel insertion it is concluded that the grammar of ECA treats CVC_iC_i like the other types of CVCC. Notably, the strategy that is used here with CVC_iC_i syllable type differs from that noticed in IBA. Whereas IBA deletes final C_i of CVC_iC_i when morphology is incapable to provide a vowel-initial suffix, ECA operates the vowel insertion. Hence, IBA resolves CVC_iC_i on the expense of deleting a root-consonant whereas ECA preserves the root-consonant on the expense of operating the vowel insertion. Observe that IBA, in contrast to ECA, operates the vowel insertion in both levels, (i.e. the stem-level and the word-level). In addition, its operation registers high rate in this dialect which makes the selection of another strategy to resolve CVC_iC_i significance. It is also significance that ECA, which displays high preservation for

the segmental component of the root in both levels; the stem-level and the word-level, turns to deleting root-consonant to resolve CVC$_i$C$_i$ even though it allows the other types of CVCCs. This again demonstrates that phonology is manufactured to create diversity.

Another conclusion is related to the developing geminate structure. The underlying /waʒh/ "face" has developed in ECA to a structure with an underlying geminate. This conclusion is based on the stem-form, (i.e., [wiʃ]) and the inflected-forms, (e.g., [wiʃʃ-i] "face.1Pers.Sing") that were obtained. The final post-alveolar /ʃ/ is perceived as geminate in the inflected-forms. In addition, it behaves as geminate in both stem-form and inflected-forms as the final /ʃ/ gets deleted in the stem-form and surfaces in the inflected-forms. I cannot confirm as this would require more data. However, it seems that developing geminate requires substituting the phonetic value of the underlying sound first. More about the developing geminate structure is presented when discussing a similar data that belongs to KħA.

Sixthly, ECA has lost morphemic categories and morphemic allomorphs. This loss underwent stages until it reached its current stage. The evidence for this comes from contrasting 1Pers.Sing and 3Pers.Sing.Masc of ECA with those of SA. My conclusion is that the units [-i] and [-j] of ECA are phonological reduction of the 1Pers.Sing of SA, (i.e., [-ija]). However, the category 1Pers.Sing in SA consists of other units, these are, [-i], [-ii]. Because of its segmental length, I think [-ija], which is the least distributed, is older than [-i] and [-ii]. The long front [-ii], is argued to be a result for two processes. The first is the deletion of the back vowel [a] whereas the second is substituting the palatal [j] with the close front [i]. The substitution of the semivowel [j] to its correspondent vowel [i] is presumably an action that was made to ease the phonological reduction. As for the unit [-i], which is the smallest unit and most wide distributed, it is thought to be the youngest. The unit [-i] is argued to be the final result of the gradual phonological reduction which the segmental component of the morpheme [-ija] has undergone. Yet, observe that the consonant [j] is retained for some environments. As for the category 3Pers.Sing.Masc, in SA it contains the unit, (i.e., [-hu]), whereas in ECA it contains the units, (i.e., [-u] and [-h]). The vocalic unit [-u] is more common in ECA than [-h]. This means that the phonological reduction targeted the voiceless glottal fricative /h/. However, since the glottal fricative was found functioning in one stem, then this consonant was also retained for some environments. These findings in both morphological categories reveal that the phonological reduction, which targeted [-ija] and [-hu], was operating selectivity. Thus, phonologically [-u] was selected over [-h] to function as unit in more instances, and phonologically [-i] was selected over [-j] to function as a unit in

135

more instances. Therefore, a vocalic unit in the two categories is what function most because of a phonological selection. This phonological selection indicates that with time the two categories, just like the case categories, are going to be lost. The justification for this expectation is that the loss of a vowel is easier.

4.3.2.3 KħA

Examining the KħA gave new findings that show that the loss of the vocalic case endings developed another different grammar. In this section observations about this grammar and conclusions are presented. Just like the other sections it ends with basic generalizations about the grammar of KħA whereas it starts with the observations.

Starting with the observations on the stem-forms:

i. The 60 CVCC stems surface in their stem-forms as CVCC (29 realizations), CVCVC (23 realizations), CVVC (5 realizations), CVC (3 realizations) and CVCV (2 realizations). Therefore, I obtained 63 stem-forms for the 60 stems.

ii. The stems that have potential to violate SSP surface in the 60 stems are 27 as mentioned when discussing the classical data. It was observed that of these 27 stems 25 stems avoid SSP violations. These 25 stems surface in KħA as CVCVC (20 stems), CVVC (4 stems), CVCV (1 stem). Only 2 stems that violate SSP were found in this set of data as these two surface as CVCC. Hence, the percentage of avoiding the violation of SSP in KħA is 92.59 %.

iii. The 2 stems that violate SSP are /ħusn/→[ħisn] "beauty" and /wusʕ/→[wisʕ] "capability". Thus, in percentage the violation of SSP in KħA is mainly 6.89 %.

iv. The 5 CVVC realizations are: the 3 CVʔV underlying stems, the stem /zawʒ/→[zooʒ] "husband" and the stem /riʒl/→[riil] "leg". Surfacing CVʔC stems as CVVC in the stem-form is similar to IBA and ECA, (e.g., /raʔs/→[raas] "head"). Surfacing /zawʒ/→[zooʒ] is similar to one of the IBA surfaces for this input. Surfacing /riʒl/ as [riil] is a new type of realization. It is observed that in KħA, the post-alveolar fricative voiced /ʒ/ may realize as the palatal glide /j/ such as /daʒaaʒah/→[dijaaja] "chicken", or as the long monophthong [ee] such as /ʒiʔt/→[jeet] "I came". This phenomenon might explain the realization [riil].

v. The 3 CVC realizations are firstly the stem-form of the underlying /ʃarr/, (i.e., [ʃar] "evil"). The final C_i of the underlying geminate does not surface in the stem-form. Secondly, the underlying /sˤidq/ realizes as [sˤiʒ]. I assume that the voiced alveolar plosive /d/ was substituted with the voiced post-alveolar /ʒ/ and the uvular was

136

deleted. Finally, the underlying /ʃajʔ/ realizes as [ʃaj] exhibiting the deletion of the glottal stop.

vi. The 2 realizations CVCV are for the underlying /ɣalj/→[ɣali] "boil" and /difʔ/→[difa] "warmth". In both the final C is substituted with a vowel.

vii. Root-vowel substitution is found in 2 stem-forms of CaCC stems, 10 stem-forms of CuCC stems and 4 stem-forms of CiCC stems. Hence, the percentage of the root-vowel substitution in the stem-forms is 26.66 %. The 2 CaCC stems that displayed the substitution are /zawʒ/ and /raʔs/. The 10 CuCC stems that displayed the substitutions are /ʔuxt/, /rukn/, /kurh/, /duhn/, /ʕuðr/, /sˤulħ/, /wusʕ/, /ħuzn/, /sˤunʕ/ and /ħusn/. The 4 CiCC stems are "/biʔr/, /ðiʔb/, /riʒl/ and /qistˤ/.

viii. The vowel insertion operates in 21 stems, (i.e., 5 CaCC, 9 CuCC and 7 CiCC). Hence, in KħA the vowel insertion in percentage is 35%. The phonetic values of the epenthetic vowels are either [a], [u] or [i]. In CaCC stems I found [a] in 4 stem-forms and [i] in 1 stem-form. In CuCC stems the epenthetic vowels are [i] in 5 stem-forms and /u/ in 4 stem-forms. In the 7 CiCC stems the epenthetic vowels are only the front [i].

Moving to the observations on the inflected-forms:

i. The 21 CVCC stems that realize in their stem-forms as CVCVC display the vowel insertion when the morphology cannot supply a vowel-initial suffix. Hence, when being inflected with [-na] "1Pers.Plur", [-kum] "2Pers.Plur", [-ha] "3Pers.Sing.Fem" or [-hum] "3Pers.Plur".

ii. There are 2 underlying stems of the 21 stems that have more than one stem-form, (i.e., /ʔuxt/ "sister" and /ʒuzʔ/). In addition to the CVCVC stem-form, these 2 stems surface another stem-form of the type CVCC. However, whereas the inflected-forms of /ʔuxt/ display the two stem-forms CVCVC and CVCC, the inflected forms of /ʒuzʔ/ surface only the CVCC stem-form as a base.

iii. The root-vowel substitution appears in 27 stems in the inflected-forms data. These are the 26 stems that were mentioned in (vii observation of the stem-forms) and the stem /mulk/. Whereas /mulk/ surfaces as [mulk] in its stem-form, in all its inflected-forms it displays a root-vowel substitution in which [u] is substituted with [i].

iv. All the 3 CVC stem-forms, (i.e., [ʃaj], [[ʃar] and [sˤiʒ]) when being inflected with vowel-initial suffix display geminate. This geminate does not appear when the attached suffix is consonant-initial suffix. For example, [ʃajj-i] "thing.1Pers.Sing",

[ʃarr-i] "evil.1Pers.Sing" and [sˤiʒʒ-i] "truth.1Pers.Sing" in contrast to [ʃaj-na] "thing.1Pers.Plur", [ʃar-na] "evil.1Pers.Plur" and [sˤiʒ-na] "truth.1Pers.Plur".

v.   The stem-form [ɣali], which is underlyingly /ɣalj/, is noticed to surface the glide when being inflected with a vowel-initial suffix, (e.g., [ɣalj-ik] "boil.2Pers.Sing.Masc"). When /ɣalj/ is inflected with consonant-initial suffix the surfaced is the long [ii], (e.g., [ɣalii-hum] "boil.3Pers.Plur").

vi.   All the inflected-forms of the stem-form [dif**a**], which underlyingly is /difʔ/, surface the long /aa/ instead of the short [**a**]. However, it is observed that just like ECA, KħA displays allomorphs for the vowel-initial suffixes for this stem. Just like ECA, instead of the front [-i] "1Pers.Sing" the surfaced is the palatal glide [-j], hence [difaa-j] not *[difaa-i]. Instead of the back [-a], which marks 3Pers.Sing.Masc, the voiceless glottal fricative [-h] is surfaced, thus the realization is [difaa-h]. To mark the 2Pers.Sing.Masc, it was found that KħA surfaces [difaa-k] not *[difaa-ik]. Hence, it is concluded that KħA has two morphemic units that mark 2Pers.Sing.Masc, these are, [-ik] and [-k]. It is also concluded that KħA has two morphemic units that mark 2Pers.Sing.Fem, these are [-iʧ] and [-ʧ]. This conclusion is because whereas [-iʧ] is the observed unit that marks the rest 59 stems in the morphemic category 2Pers.Sing.Fem, it is [-ʧ] that marks [difaa] in this category.

vii.   Based on the observations the pronominal suffixes of KħA in contrast to those of SA are presented in table 4.8.

Person	KħA	SA	Gloss
1Pers	[-i]≈[-j]	[-i]≈[-ii]≈[ija]	Sing
	[-na]	[-naa]	Plur
2Pers	[-ik]≈[-k]	[-ka]	Sing.Masc
	[-iʧ]≈[-ʧ]	[-ki]	Sing.Fem
	[-kum]	[-kum]	Plur.Masc
		[-kunna]	Plural.Fem
		[-kumaa]	Dual
3Pers	[-a]≈[-h]	[-hu]	Sing.Masc
	[-ha]	[-haa]	Sing.Fem
	[-hum]	[-hum]≈[him]	Plur.Masc
		[-hunna]	Plur.Fem
		[-humaa]	Dual

Table 4.8 the pronominal suffixes of KħA and SA

The conclusions and generalizations that are formed are the following. Firstly, the grammar of KħA is shaped based on SSP. The data display that this phonological principle is highly motivated in this dialect. Thus, a suggested constraints hierarchy for this dialect should display the significance of SSP in the grammar of this dialect.

Secondly, unless SSP is involved the CVCC is surfacing in both the stem-level and word-level. This contrasts with both IBA and ECA. Notably, whereas the grammar of IBA does not allow CVCC to surface in both stem-level and word-level, the grammar of ECA allows CVCC to surface mainly in the stem-level. Therefore, since in KħA CVCC is allowed to surface in both levels it is concluded that the superheavy CVCC syllable type is well accommodated in this dialect in contrast to the aforementioned dialects.

Thirdly, just like IBA, the superheavy CVVC syllable type is accommodated well in this dialect in both levels; the stem-level and word-level. Hence, in contrast to ECA, KħA does display shorting process to avoid the CVVC.

Fourthly, the geminate in this dialect behaves just like the geminate in IBA. Hence, based on the observations, it is generalized that the final C_i does not surface in a stem-form or in inflected-forms that are inflected with consonant-initial suffixes. Thus, the three Arabic dialects display mainly two patterns in relation to surfacing the geminate in the investigated monosyllabic nominal stems. In contrast, they display three patterns in terms of how the syllable CVCC is accommodated, (No accommodation, partial accommodation and well accommodation). As will be seen in section 4.3.2.4 below, MMA proves that even though it is among the Arabic dialects that are known to allow syllabic complexity in the surface but it does not have the forth pattern of accommodating the syllable CVCC, (i.e., the complete accommodation). Yet, this dialect presents a new interesting finding, that is, there is an innovation of another superheavy syllable type that IBA, ECA and KħA do not surface. This is the superheavy syllable CCVC.

Another conclusion regarding the geminate in KħA, is that this dialect displayed more realizations with geminate. Notably, IBA data has only 1, ECA has 2, KħA has 3 and MMA, as will be seen, has only 1. From the beginning the text was designed to include mainly 1 stem with an underlying geminate. However, as have been seen when discussing the ECA data, a geminate was developed from the stem /waʒh/. KħA has shown a development of two geminate structures in different stems. These are /ʃajʔ/ "thing" and /sˤidq/ "truth". Because of the numbers of stems that display this development, it is generalized that KħA in contrast to the other three Arabic dialects has a grammar that tolerates the geminate more than them. Tolerating geminates in the modern Arabic dialects is a worth of investigation as, in a non-

formal bases, I have noticed that there are Arabic dialects that surface geminate more than KħA, (e.g., Omani Arabic).

As for the glottal stop in KħA, generally the glottal stop is deleted and compensated in all CVʔC stems and in CVCʔ. Those stems that have CVʔC always realize as CVVC in the stem-forms and inflected-forms. In contrast, the 3 CVCʔ stems were found exhibiting three patterns. The first is deleting the glottal stop in all realizations, whether in stem-form or inflected-form and compensating ʔ mainly in the inflected-forms. This compensating process is a lengthening for the preceding segment. This pattern appears in 2 of the 3 stems (i.e., /ʃajʔ/ "thing" and /difʔ/ warmth"). The second and the third patterns appear in the stem /ʒuzʔ/. This stem has stem-forms, these are, [ʒuzʔ] and [ʒuzʊw]. Only the stem-form [ʒuzʔ] was found inflected as a base. The patterns of realizations of this word are thus similar to patterns of the same stem in IBA as one realization exhibits the vowel insertion and the gliding of the glottal stop whereas the other surfaces the glottal stop. However, when contrasting the inflected-forms it can be seen that distinctions exist. For instance, even though the two dialects agree that the inflected-forms of /ʒuzʔ/ is formed by inflecting the base [ʒuzʔ] but these inflected-forms are not the same. The inflected-forms of IBA in contrast to the inflected-forms of KħA exhibit vowel insertion. This difference is because of the prosodic requirement in the two languages. IBA grammar prohibits the realization of CVCC whereas KħA grammar prohibits specific realization of CVCC, (i.e., the one that violates SSP). Thus, because [ʒuzʔ] does not violate SSP no insertion process is operated in this stem whether in the stem-form or the inflected-forms in KħA. On the other hand, the stem-form [ʒuzʊw] is an old realization in both IBA and KħA, this might explain why it does not have inflected-forms.

Seventhly, just like IBA and ECA, in KħA the evidence also sustains the generalization that the two glides are targeted by phonology in terms of their distribution. The glide-middle in the root /zawʒ/ "husband" was found realizing as [zoog] in both the stem-form and inflected-forms. Hence, the glide is surfacing as a long monophthong [oo], which is something already found in other Arabic dialects, (i.e., IBA and according to Hamid (1984) in SCA). The stem /ɣalj/ was found surfacing as [ɣali], [ɣalj-V] and [ɣalii-C], where the capital V and C are referring to the initial of a suffix whether vowel or consonant. This is again the pattern that was found in IBA. Therefore, the significance about the glides as consonants are undergoing a process of sound change is that this process targets reorganize their distribution. This target differs from the target of the sound change process which the glottal stop has undergone. The conclusion from this is that processing sounds to change is not always of the same target.

Lastly, in KħA, the underlying /difʕ/ has inflected-forms with allomorphs that do not surface in the rest 59 CVCC stems. This was also observed in ECA for the same underlying stem. Both KħA and ECA exhibit the same allomorphs (i.e., [-j], and [-h]) in the same morphological categories, (i.e., 1Pers.Sing and 3Pers.Sing.Masc). The significance about /difʕ/ in the aforementioned categories is that in contrast to IBA, the base in ECA and KħA is CVCVV is CVCG. Phonologically what distinguishes CV.CVV as a base from CVCG is that it is disyllabic that ends with a long final vowel. Thus, it is the phonological environment what distinguishes the base of ECA and KħA. Clearly, in contrast to the IBA base, the base in ECA and KħA lacks coda. Accordingly, it seems that the consonantal units are preserved for the phonological environments that lack coda, whereas the vocalic units are to resyllabify a coda as onset. Critically, the phonological target here is not about the syllable structure; rather, it is about the syllabic type. The consonantal preserved unit supplies a coda for a CVV syllable type. This means that the base CV.CVV when inflecting which [-j] or [–h], depending on the category, will surface as CV.CVV-C. Hence, this morphological supplying of a suffix is canonizing the superheavy CVVC syllable type not resolving it. This morphological action contrasts with its actions in the monosyllabic bases as it tends to supply vowel-initial suffixes that resolve the superheavy syllables. Thus, it seems that how the superheavy syllables are accommodated differs based on the length of the bases. This is evidence that in disyllabic bases the final syllables are allowed to be of the superheavy syllable type CVVC in ECA and KħA but not IBA. Nonetheless, the side-effect(s) of the canonization of CVVC on the syllable structures is a question considering that the evidence indicates that there is currently phonological preference for a final coda-less in 1Pers.Sing and 3Pers.Sing.Masc categories. This conclusion is because the vocalic units are more functional than the consonantal units. Yet, assessing more bases that end with the syllable CVV might shed more lights. As for MMA data in the two categories 3Pers.Sing.Masc and 1Pers.Sing for the stem /difʕ/, it was found that the base that ends with CVV appears mainly in 3Pers.Sing.Masc. Thus, whereas the consonantal unit [-h] functions in 3Pers.Sing.Masc for /difʕ/ the regular [-i] is functioning in 1Pers.Sing. This confirms the relationship between the type of final syllable in the base and the occurrence of the consonantal morphological unit.

4.3.2.4 MMA

Characteristics of MMA grammar that were concluded from the collected data show that this dialect is more analytical than the other dialects. In addition, as will be seen, not only

the superheavy syllables CVVC and CVCC were found in the MMA data as the evolution of CCVC syllable type is observed in this dialect. In other words, the grammar of this modern Arabic dialect displays syllabic complexity not only in codas but also in onsets. This section outlines the main observations, conclusions and generalizations about the MMA grammar. Starting with the observations on the stem-forms:

i. The 60 CVCC stems in MMA realize as: CVCC (28 realizations), CCVC (11 realizations), CVVC (4 realizations), CCV (1 realization), CVCVC (11 realizations), CVCV (1 realization), CVC (3 realizations), VCVC (1 realization) and CV (1 realization). In addition, 10 stems displayed a realization that is, morphologically, either belongs to the same word-family, (i.e., 5 stems) or to a different word-family (i.e., 5 stems). Thus, totally, the number of the obtained stem-forms is 71.

ii. Avoiding SSP violation is a target in MMA according to the findings. To explain, it is found that the violation of SSP in stem-forms equals mainly 14.81% whereas the restrain to SSP equals 88.88%. The percentage 14.81% was gained from dividing the number 4, which is the number of stem-forms that violate SSP on the number 27, (i.e., the total number of stems in the set that has the potential to violate SSP). The percentage 88.88% was gained from dividing the number 24, (the number of stem-forms that avoid SSP violation) on 27. It was observed that of the 27 stems there is 1 stem that has two stem-forms; one that violates SSP and other that exhibit a resolution for SSP violation. Thus, the total number of stem-forms that was obtained for the 27 stems is 28.

iii. The main resolutions to avoid SSP violation that were observed in the 24 stem-forms are root-metathesis, (i.e., CVCC→CCVC) and vowel insertion, (i.e., CVC*V*C). The root-metathesis shifts the nucleus position in a way that breaks up the final-cluster and form initial-cluster. Thus, the shift resolves SSP violation and creates complexity in the syllabic realization. In contrast, the vowel insertion resolves SSP violation and simplifies the syllabic realization but increases its length. Thus, the two processes share the target of resolving SSP but conflict in the type of syllabification they create. Clearly, the consequences of operating them on the monosyllabic root are different. The shift preserves the monosyllabicity of the root whereas the insertion creates disyllabicity. Yet, the monosyllabic surface that results from the shift is a new syllabic innovation that does not exist in the syllabic inventory. In contrast, even though the vowel insertion increases the length of the surfaced structure but the two syllables that are surfaced are canonical. Another observation is that, as far as the collected data, the

142

shit does not occur in CuCC stems and the vowel insertion does not occur in CaCC stems. Another process that was noticed to be employed to resolve SSP violation is the morphological substitution in which the singular investigated form is substituted with other forms that belong to the same word-family of the stem. Another type of morphological substitution that was found is substituting the investigated stem with a different stem that might be borrowed from a language other than Arabic.

iv. 28 stems realize in their stem-forms as CVCC. These stems are 8 belong to CaCC stems, 12 belong to CuCC stems and 8 belong to CiCC stems. The 8 CaCC stems are /nafs/, /waʕd/, /sabt/, /ħarf/, /kalb/, /qalb/ and /ʔardˤ/. The 12 CuCC stems are /ʒuzʔ/, /mulk/, /rukn/, /ðˤulm/, /kurh/, /ʕurf/, /ruʕb/, /sˤulħ/, /sˤunʕ/, /ħuzn/ and /ħusn/. The 8 CiCC stems are /difʔ/, /sˤidq/, /ħizb/, /misk/, /ʔiðn/, /qistˤ/, /ʕilm/ and /milħ/.

v. 11 stems were found realizing as CCVC. It was found that 6 of these stems belong to CaCC stems and 5 belong to CiCC stems. The 6 CaCC stems are /ʃahr/, /barq/, /baħr/, /zarʕ/, /laħm/ and /fadˤl/. The 5 CiCC stems are /ʒiðʕ/, /ʕizl/, /fiʕl/, /siħr/ and /riʒl/. No CCVC stem-form was found for CuCC stems.

vi. The CVVC realizations are found for 4 stems. These are the 3 CVʔC stems and /zawʒ/ "spouse". The CVʔC stems display deletion for the glottal stop and lengthening the preceding vowel. The underlying /zawʒ/ was pronounced as [zuuʒ]. However, I was informed that the meaning "husband" for the underlying /zawʒ/ is not used in MMA. Rather, the meaning "husband" is introduced through [raaʒil] (see xiv below for more detail).

vii. The 1 CCV realization is [ɣla] which is the stem-from for the underlying /ɣalj/.

viii. The 11 CVC*V*C realizations were found in 1 CaCC stem, 7 CuCC stems and 3 CiCC stems. Hence, totally the vowel insertion appears in 18.33% of the whole data. The CaCC stem is /waʒh/. The 7 CuCC stems are /buxl/, /rukn/, /kufr/, /ʃukr/, /ħukm/, /ʕuðr/ and /wusʕ/. The 3 CiCC stems are /kibr/, /siʒn/ and /ʃiʕr/. In terms of the phonetic value of the epenthetic vowel, mainly /i/ is observed in the stem-forms of CiCC stems and CaCC stems. The stem-forms of CuCC stems exhibit /i/ in 2 stem-forms whereas the rest exhibit /u/. Those that exhibit the front are the stem-forms of /ʕuðr/ and /wusʕ/.

ix. The 1 VCVC realization was found for the underlying /waʒh/. This stem has a stem-form in which a root-consonant is deleted. The labial-velar, which is root-initial in this stem, is found substituted with a round vowel as can be seen from the stem-form [uʒih]. This structure was not observed elsewhere in the collected data. I should

143

mention that a preceding glottal stop is perceived[10]. I do not transcribe it because of what is known about the words that are vowel-initial. Nonetheless, the stem /waʒh/ has another stem-form that displays i-insertion, (i.e., [wiʒih]). I assume that [wiʒih] is older from the realization [uʒih]. Thus, substituting the glide /w/ with /u/ is something came in a later stage.

x.   The CVCV realization is found mainly for the underlying /difʔ/. This underlying monosyllabic stem surfaces as [dafa].

xi.   The CVC realization is surfaced as a stem-form for the underlying that has geminate /ʃarr/. In MMA, the stem-form for this underlying is [ʃar]. The underlying /ʔuxt/ "sister" has 2 CVC stem-forms, (i.e., [xit] and [xut]).

xii.   The 1 CV realization was obtained as a stem-form for underlying /ʃajʔ/.

xiii. The root-vowel substitution is observed in 18 stems. Hence, in percentage it appears in 30% of the data. 6 stems of these 18 stems belong to CaCC stems, (i.e., /sabt/ /waʒh/, /zawʒ/, /kalb/, /raʔs/ and /ʃajʔ/). Those that belong to CuCC are 5, (i.e., /ʔuxt/, /mulk/, /duhn/, /sˤubħ/ and /wusʕ/. Those that belong to CiCC are 7, (i.e., /ʒiðʕ/, /biʔr/, /ðiʔb/, /milħ/, /rizq/, /siħr/ and /difʔ/).

xiv.   5 stems display a morphological resolution for CVCC; this is, substituting the singular investigated stem with another stem that belongs to the same family. As said before, the Qur'anic readings manifest this morphological resolution for CVCC, though as far as my search, MMA manifests it more. An example from the Qur'anic readings is the realization of the underlying /duhn-V/ "fat". This stem appears only once in the holy text and is realized in the Qur'anic readings as [bi-d-duhn-i] "with the fat.Gen.Sing". However, there is one reading attributed to Sulaimaan Ibn ʕabd Almalik and Al-ʔaʃahb that surfaces it as [bi-d-dihaan-i] which is the plural realization as notified in the Alkhatiib's dictionary (2002: vol.6, p. 160-161). Hence, it is a different stem that belongs to the same word-family of the singular /duhn-V/. Interestingly, the MMA stem-form for this stem is [dhaan]. As can be seen, the only difference from the plural classical realization is that the MMA realization [dhaan] displays complexity on the onset contrasting in this with [dahaan]. The second example for this strategy is from mainly MMA stem-form realizations. The underlying /sˤubħ/ "morning" is [sˤabaaħ]. The two realizations [sˤubħ-V] and [sˤabaaħ-V] basically mean "morning" in the classical era. However, semantically, substituting [sˤubħ-V] with [sˤabaaħ-V] does not

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[10] For those who are more familiar with ALT terminologies, such glottal stop is assumingly can be referred to with the term همزة وصل *Hamzah wasl*.

always results in a grammatical sentence which indicates that the two are not exactly synonym. In KħA the two realizations [sˤabaaħ] and [sˤubħ] are realized as two functional stems but in MMA only the realization [sˤabaaħ] is found functional. The non-functionality of [sˤubħ] in MMA sustains the conclusion that [sˤabaaħ] is a replacement that aims resolving the complexity of [sˤubħ]. The third example is for the underlying /milħ/ "salt" which is realized as [malħ-a]. This realization, linguistically, is a singular feminine realization whereas the searched stem is a singular masculine. The fourth example is the underlying /raʕd/ which also gives a singular feminine realization, (i.e., [raʕd-a] instead of the searched singular masculine). Lastly, instead of realizations such as [zuug]≈[guuz]≈[zooʒ]≈[zawiʒ] which in the modern Arabic dialects mean "husband" and they are dialectal outputs of one input /zawʒ/ the realization in MMA is [raaʒil]. The MMA realization, linguistically, is an output of /raʒul/ "man in CA, SA and MSA". MMA is not exclusive in such strategy of word-replacement as KħA surface for the meaning "husband" [rajil]. The underlying /raʒul/ in KħA surface for the meaning "man" [rajjaal]. That [rajil] is another output for /raʒul/ concluded from the similarities between [rajil] and /raʒul/ from one side and from the other side its concluded from the similarities between [rajil] and [rajjaal]. Thus, the two different stem-forms are concluded to be results of an output-split for the underlying /raʒul/ "man". The same kind of output-split that was found in IBA for the stem /zawʒ/ Nonetheless, in contrast to MMA, in KħA [zooʒ] and [rajil] means "husband". In MMA it is mainly [raaʒil] that means "husband" as the realization [zuuʒ] in this dialect is used functionally to express the duality; hence, meaning "the two".

xv. The MMA data exhibited another morphological strategy to resolve CVCC. It was observed that there are stems that belong to different families are replacing the searched stems. The number that was noticed is 5 stems. Some of these replacements belong to languages other than Arabic. Worth mentioning, IBA displayed this process in 1 stem, (i.e., /ʃajʔ/→[ħaaʒa]) whereas ECA displayed it in 2 stems, (i.e., /ʃajʔ/→[ħaaga] and /ʒuzʔ/→[tˤarf]). Yet, I admit that I was not observant for this process. In one of its replacement, MMA has /ʃajʔ/→[ħaaʒa]. It also replaces /siʒn/ with [ħabs]. This replacement interesting because it does not resolve the superheavy syllable type or SSP violation. The other three replacements are in their type found exclusively in MMA. MMA was found replacing CVCC stems with non-Arabic words. For instance, for the meaning "avarice", which a realization of /buxl/ would

express it, was found expressed through the non-Arabic word [siqraam]. Another example is the meaning "double" which is expressed through [dduble] which is not an output of the Arabic investigated /dˤiʕf/. Finally, I was informed that for the meaning "Backlog" MMA produces [qint] not /rukn/.

Moving to the inflected-forms:

i. The observation revealed that the MMA data can be classified to either systematic syllabic realizations or arbitrary syllabic realizations. Notably, the systematic realizations stems have three realizations possibilities. The first pattern appears in 18 stems. In this pattern of systematic realizations the stem-form is the base in all the paradigm of a stem. The second pattern appears in mainly 3 stems. In this pattern the stem-form is not the base of all the inflected-forms. Rather, the inflected-forms in the paradigm of a stem are divided to those that have the stem-form as a base and others that display a different base. The third is found in 11 stems. The unique about this pattern is that it exhibits different bases depending on the type of the attached suffix. Thus, those that are inflected with consonant-initial suffixes have a base that differs from the base of those that are inflected with vowel-initial suffixes. The arbitrary realizations are the ones that exhibit mixture bases that cannot be classified to any of the three aforementioned patterns. The arbitrary realizations were found in 15 stems. There are also 13 stems that were not classified because I do not have the complete set of their paradigms.

ii. The first systematic pattern: the 18 stems that display one base in both the stem-form and inflected forms are observed to be in 14 stems that have the base CVCC, 3 stems that have the base CVVC and 1 stem that has the base CCVC. The 11 stems that have CVCC as a base are /nafs/, /sabt/, /ħarf/, /kalb/, /qalb/, /ʔardˤ/, /dˤulm/, /ʕurf/, /ruʕb/, /sˤulħ/ and /sˤunʕ/ /sˤidq/, /ħizb/, /ʕilm/ and /ʕilm/. The 3 stems that have CVVC as a base are /raʔs/, /biʔr/ and /ðiʔb/. The stem that has CCVC as a base is /ʒiðʕ/. Yet, an irregularity was observed in relation to the phonetic value of the root-vowel of the base of two stems, (i.e., /nafs/ and /ʒiðʕ/).Within the set of their paradigm one surface exhibited a preserving for the root-vowel whereas the other surfaces exhibited root-vowel substitution. The stem-form in the set of the stem /nafs/ preserves the back vowel whereas the other surfaces [i] instead of [a] within the same type of base, (i.e., CVCC). The root-vowel was preserved in 1 inflected-form of the stem /ʒiðʕ/, this is, 1Pers.Sing. The other surfaces in the set of /ʒiðʕ/ display substitution in which [a] surfaces instead of the underlying [i]. Observingly, the surfaces of /ʒiðʕ/ also display

146

one syllabic base, (i.e., CCVC). The irregularity of surfacing at least one syllabic base that exhibit vocalic lexical difference in the paradigm of a stem is noticed in other systematic patterns in a way that justifies the argument that this singularity is regularity in MMA.

iii. The second systematic pattern: 3 stems that display a base in the stem-form and another base in all the inflected-forms, (i.e., /barq/, /ʔuxt/ and /sˤubħ/). Syllabically, the set of paradigm of /ʔuxt/ contains mainly two bases, these are, CVC in the stem-form and in the inflected-form is CC whether this base was attached to vowel-initial suffix or consonant-initial suffix. The significance about the CC base is that it proofs that MMA allows the sequence of CCC word-initially in the inflected-forms. Yet, only this one proof was found in whole data. On the other hand, the stem-form of /ʔuxt/has syllabically one CVC as a base but lexically it has two bases, (i.e., [xit] and [xut]). Clearly, [xut] preserves the underlying round root-vowel whereas [xit] substitute it with the front [i].

iv. The third systematic pattern: the 11 stems that display a base when inflecting with vowel-initial suffixes and other base(s) when inflecting with consonant-initial suffixes can be classified into two sub-patterns. The first sub-pattern is already observed in the other three dialects IBA, ECA and KħA. In this sub-pattern a process is provoked mainly to break up the consonantal cluster when inflecting with consonant-initial suffixes and blocked when the morphology resolves the cluster through supplying vowel-initial suffixes. This sub-pattern is found in 7 stems of MMA data, these are, /baħr/, /fadˤl/, /rizq/, /siħr/, /riʒl/, /wusʕ/ and /ʃiʕr/. The stem /baħr/ "sea", for instance, was found surfacing as [bħar-C][11] when inflecting with the consonant-initial suffixes and as [baħr-V][12] when inflecting with vowel-initial suffix. The stem /wusʕ/ has a set of paradigm that is either [wis*i*ʕ-C] or [wisʕ-V]. Thus, the resolution, whether the shift or the vowel insertion appears only in the consonantal inflected-forms. Another observation regarding this pattern is that the base that is surfaced in the stem-form is one of the two bases that are surfaced in the inflected-forms. In other words, the paradigm of each stem has only two bases. The other sub-pattern exhibite no less than 3 bases though it remains under the same general classification, (i.e., the occurrence of the processes is controlled by the suffixes in terms of being vowel-initial or consonant-initial). This sub-pattern was not found in IBA, ECA and KħA data and

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[11] The capital C here is an abbreviation for consonant-initial suffix.
[12] The capital V here is an abbreviation for vowel-initial suffix.

only 4 stems of MMA data can be classified to it, (i.e., /laħm/, /kufr/, /ʃukr/ and /ʕiʒl/). For instance, the stem /laħm/ has 3 bases; the base in the stem-form is [lħam]. The base [laħm-] appears in the inflected-forms which are formed by combining a base and vowel-initial suffixes. Two bases occur inflected with consonant-initial suffixes, these are, [lħam-] and [laħ*a*m-]. Observe that [lħam-] is the base of the stem-form whereas [laħ*a*m-] is a new base. However, both bases resolve SSP violation though through different repair strategy. Nonetheless, the consonantal inflected-forms of /laħm/ are [lħam-na] "meat.1Pers.Plur", [lħam-kum] "meat.2Pers.Plur", [lħam-hum] "meat.3Pers.Plur" and [laħ*a*m-ha] "meat.3Pers.Sing.Fem". Therefore, there is only 1 inflected-form that displays the base with the vowel insertion whereas the other inflected-forms display the base with the shift. It is not always that only 1 inflected-form that displays such irregularity. The stem /ʃukr/ "gratitude", for instance, displays division over bases. The four consonantal inflected-forms in the paradigm of /ʃukr/ dived equally; two inflected-forms for a base. However, this stem was found exhibiting the argued regularity, as even though syllabically it exhibits 3 bases but the phonetic values of the vowels in these bases are not always the same. To explain, the stem-form of /ʃukr/ has the base [ʃuk*u*r], which resolves SSP violation, in the stem-form. The need to resolve SSP is restricted to the four consonantal inflected-forms. Thus, this base occurs in the consonantal set of the paradigm of /ʃukr/. However, it surfaces as a CVC*V*C syllabic structure but not in terms of its vocalic lexical component. This CVC*V*C base surfaces when combined to 3Pers.Sing.Fem as [ʃik*i*r-ha] and when combined to 3Pers.Plur as [ʃuk*i*r-hum]. The other base that appears in the consonantal set of /ʃukr/ also displays this irregularity. Structurally this base resolves SSP violation through root-metathesis/shift; hence, syllabically, it is CCVC. However, lexically it surfaces as [ʃk*i*r-na] when combined to 1Pers.Sing.Fem and as [ʃk*u*r-kum] when combined to 2Pers.Plur.

v. The 15 stems that were classified as arbitrary are /zarʕ/, /raʕd/, /ʃarr/, /ʃahr/, /waʒh/, /waʕd/, /kurh/, /ħusn/, /mulk/, /ħuzn/, /ʕuðr/, /misk/, /milħ/ /difʔ/ and /fiʕl/. The reason that makes these classified as arbitrary is not because their realizations do not display a systematic pattern; rather, it is because they have within their paradigm set at least one surface that conflicts with a recognized pattern or a specific phenomenon were not observed in other stems. For instance, the stem /fiʕl/ displays the third systematic pattern. The two repair strategies that resolve SSP, (i.e., vowel insertion and nucleus-metathesis) are recognized in consonantal inflected-forms. Hence, these surface as

either [fʕil-C] or [fiʕil-C]. However, one consonantal inflected-form bans categorizing /fiʕl/ under the third pattern because it conflicts with the general classification norm of the third pattern. This norm determines that the occurrence of the processes which has to controlled by the suffixes in terms of being vowel-initial or consonant-initial. This one inflected-form, (i.e., [fiʕila-ha]) is formed by inflecting a base with the consonant-initial suffix [-ha] "3Pers.Sing Fem". As can be seen, two vowel insertions are observed in the surfaced structure. The epenthetic /a/ in this inflected-form syllabifies the lateral as onset preventing it from surfacing as coda. Hence, the syllables that are realized are all of the type CV. Another example, the stem that has underlying geminate which was also found displaying a conflict for a recognized pattern because of the realization [ʃarri-hum] "evil.3Pers.Plur". The recognized pattern for this stem is also the third pattern as when inflecting with consonant-initial suffix the results is surfacing mainly one of the final C_iC_i. The geminate surfaces mainly when inflecting with vowel-initial suffixes. Thus, the realization [ʃarri-hum] exhibits inconsistency with the third pattern as the final C_i is surfacing in a consonantal inflected-form. It also exhibits a vowel insertion that is not witnessed in the other realizations in the paradigm. Lastly, the final-consonant in the tri-root was noticed to be deleted in 2 stems. This final-consonant root was in both stems [k] and appeared mainly when the root attached to 2Pers.Plur, (i.e., [-kum]). The other investigated dialects exhibit geminate [kk] in this category but MMA displays the deletion of one of the underlying voiceless velar plosive. I assume that the deleted is the root-final [k] not the suffix-initial [k].

vi. The 13 stems were not classified because of the insufficient number of realizations that were collected, these are, /ɣalj/, /zawʒ/, /ʃajʔ/, /ʒuzʔ/, /buxl/, /rukn/, /duhn/, /ħukm/, /buxl/, /dˤiʕf/, /ʔiðn/, /qistˤ/, /siʒn/ and /kibr/. These were not classified because it was noticed that the arbitrary might be caused by only 1 realization. Thus, all stems with incomplete set of forms were not classified even if a pattern was recognized.

viii. Observing the vowels in both the inflected-forms and revealed that MMA display a singularity in contrast to the other dialects IBA, ECA and KħA. The phonetic values of the vowels are not always stable. The percentage of the occurrences of this non-stability is 31.66% as the inflected-forms of 19 stems display at different phonetic values for the surfaced vowels. These 19 stems /waʕd/, /fadˤl/, /rukn/, /kufr/, /ʃukr/,

/kurh/, /ʕurf/, /ruʕb/, /duhn/, /ħukm/, /ʕuðr/, /sˤulħ/, /ħuzn/, /sˤunʕ/, /ħusn/, /ʒiðʕ/, /rizq/, /siħr/ and /difʔ/.

ix. The observations show that MMA has lost pronominal suffixes more than IBA, ECA and KħA. The contrast between the pronominal suffixes in MMA and in SA is presented in table 4.9 below.

Person	MMA		SA	
1Pers	[-i]	Sing	[-i]≈[-ii]≈[ija]	Sing
	[-na]	Plur	[-naa]	Plur
2Pers	[-ik]≈[-ak]≈[uk]	Sing	[-ka]	Sing.Masc
			[-ki]	Sing.Fem
	[-kum]	Plur	[-kum]	Plur.Masc
			[-kunna]	Plural.Fem
			[-kumaa]	Dual
3Pers	[-u]	Sing.Masc	[-hu]	Sing.Masc
	[-ha]	Sing.Fem	[-haa]	Sing.Fem
	[-hum]	Sing.Plur	[-hum]≈[him]	Plur.Masc
			[-hunna]	Plur.Fem
			[-humaa]	Dual

Table 4.9 the pronominal suffixes of MMA and SA

The gender distinction is lost not only in 3Pers but also in 2Pers. The phonological effect of this lost is of significance as it is observed that [-ik] and [-ak] are not two morphemes any more. Rather, they are allomorphs for one morpheme that is the 2Pers.Sing without displaying the gender-distinction that is observed in dialects such as ECA. Interestingly, however, another allomorph in the category 2Pers.Sing was found in a CuCC. This is the allomorph [-uk] in /ʔuxt/ which its 2Pers.Sing as [xt-uk]. The evidence that the vowel [u] is not part of the stem is that in all the inflected-form, whether they were consonantal or vocalic, the surfaced base is [xt-].

The conclusions that were made and the generalizations that were formed are as following. Firstly, MMA has a grammar that avoids SSP violation. Within this consideration the grammar adopts the following three complex syllable types CVCC, CVVC and CCVC in both stem-level and word-level to avoid SSP violation. Therefore, it is generalized that the hierarchy of this dialect should display the role of SSP in surfacing onset-clusters and coda-clusters.

Secondly, it is concluded that the CVCC syllable type is accommodated well in stem-level and word-level of MMA grammar. The same conclusion is made about CVVC syllable type. As for the syllable type CCVC, even though it is accommodated in both the stem-level and word-level but I think that MMA grammar does not accommodate CCVC as much as the other two superheavy syllables. These conclusions are formed based on observing the realizations of the three syllable types in the stem-forms and inflected-forms. Only 1 stem that surfaces the syllable CCVC in all its set of surfaces in the paradigm. This contrasts with the other types of syllables. The CVCC syllable type surfaces, unless morphology supplies a vowel, in the complete set of 15 stems, (i.e., /nafs/, /sabt/, /ħarf/, /kalb/, /qalb/, /ʔardˤ/, /ðulm/, /ʕurf/, /ruʕb/, /sˤulħ/, /sˤunʕ/, /sˤidq/, /ħizb/, /ʕilm/ and /milħ/). Hence, phonology does not make effort to resolve it in the categories of these 15 stem which none of them violates SSP. The CVVC syllable type in MMA is not resolved through shortening the nucleus of CVVC. Thus, that there are no phonological repair strategies that resolve the CVCC and CVVC is taken as evidence that they are accommodated well. However, observe that there is no evidence that phonologically CCVC is resolved either. However, it is the number of stems in which their complete set displays the base as one of the superheavy syllables of what sustains that CVCC and CVVC are more accommodated by MMA grammar than CCVC. The syllable CVVC scores the highest percentage as 3 of 4 stems, have CVVC base in their complete set. The second comes is CVCC as 15 stems of 28 have CVCC base in their complete stem. The third is CCVC as only the stem /ʒiðʕ/, of the 11 stems that surface CCVC as a base, which has the base CCVC in its complete set. In percentage this equalises 75% >> 53.57% >> 9.09%.

Thirdly, it is observed that the repair strategies that are employed in MMA interweave in a paradigm of a stem. This is observed in most of the collected data as one can see that the paradigm of a stem may exhibit more than on resolution to avoid SSP violation. However, 18 stems can be excluded as these do not display except one resolution (see the observations on inflected-forms ii above). Because of this interweave syllabic complexity is high in MMA. In addition, even though it has the smallest amount of collected data in contrast to IBA, ECA and KħA but it displayed more diversity and patterns. Due to the small amount of data that are exhibiting a pattern, there is a need to investigate this dialect more to make more conclusive generalizations.

4.3.2.5 Overall

Overall the findings that were discovered about each of the four investigated modern Arabic dialects reveal that each has a distinctive grammar in terms of syllabification. The concern of this study is the evolution of CVCC syllabic type and its accommodation in the levels of grammar. The following generalizations are made in terms of this concern. Firstly, IBA does not accommodate CVCC in the stem-level and word-level. In contrast, MMA and KħA accommodate CVCC in both the stem-level and word-level within the consideration of SSP. ECA accommodate CVCC mainly in a stem-level.

The evolution of the superheavy CVVC syllable type was not among the concerns of this study. However, due to the findings that were discovered the investigation to some extent was drifted to discuss the state of this syllable in the investigated modern Arabic dialects. Therefore, a second generalization is regarding the accommodation of CVVC syllable type. It is generalized that the grammar of IBA, KħA and MMA accommodate CVVC in both the stem-level and the word-level. In contrast, ECA accommodate CVVC mainly in the stem-level.

Thirdly, since the investigation has revealed that the grammar of MMA displays an evolution of a third type of superheavy syllable, (i.e., CCVC) because of the loss of the case markers, the state of accommodating this syllable was considered. It is generalized that MMA accommodates this syllable type in the stem-level and the word-level but this accommodation is not as well as accommodating CVCC and CVVC.

Fourthly, two main repair processes were employed by phonology to resolve the consequences of the loss of the case markers. These processes vowel insertion and root-metathesis. Whereas the vowel insertion is exhibited in the grammar of the four dialects, the root-metathesis is operating in the grammar of MMA only.

Fifthly, morphology has contributed to resolve consequences of the loss in two actions. These are supplying a CVCC structure with vowel-initial suffixes and substituting CVCC stems with different morphological realizations in the form of word-replacement. However, phonology is the real organizer for the type of contribution that is presented from the morphology through the vowel-initial suffixes. To explain, the morphology would not have the ability to supply vowel-initial suffixes in the categories if phonology did not process the suffixes. All the investigated modern Arabic dialects exhibit specific vowel-initial suffixes in the categories 1Pers.Sing, 2Pers.Sing and 3Pers.Sing.Masc. The process that phonology applied on the suffixes is vowel metathesis. Notably, this morphological contribution is highly effective and active in the grammar of the four modern dialects. The

word-replacement as resolution is not that active in the grammar of the four dialects. Exclusion, however, might be argued for the MMA. Yet, the active state of this strategy in this dialect remains a question because this dialect displayed diversity and high degree of complexity.

Sixthly, the findings about specific consonants are of interest. It is concluded that the glottal stop and the glides /w/ and /j/ in the investigated modern Arabic dialects inform that they are undergoing sound change of a phonological type. Reorganizations for the realization of /w/ and /j/ are concluded to be a phonological goal that is being processed currently. In terms of the state of the glottal stop, ECA displays an enforcing for the phonemic state of this sound through substituting the uvular with a glottal stop. The extent of this enforcing process is a question that is worth of investigation, just as it is worth to investigate the real state of the glottal stop in the other dialects. Whether word-initial, word-middle or word-final, the glides and the glottal stop as phonemes are a question that requires bigger data that are collected based on phonological, morphological and syntactical criteria. Other sounds that are also a question in terms of their phonemic state in the Arabic dialects are the post-alveolar voiced fricative /ʒ/ and the velar plosive voiceless /k/. This is because /ʒ/ was found substituted in some stems with the glide /j/ in KħA. As for /k/, it was observed that this it may undergo affrication in IBA and KħA.

Seventhly, gemination in IBA, ECA and KħA was found surfacing in only the word-level. No generalization was formed about gemination in MMA because the stem with an underlying geminate displays arbitrariness. On the other hand, it was also found that ECA and KħA have a grammar type that generates geminate. Generating geminate is a worth of investigation in terms of its goal(s) in particular that there are variations in terms the average.

4.4 A discussion

The discussion here is focused on the significant of the results that were obtained from the examination. As has been seen, it was found that the syllabic change in the Arabic language includes the innovation of three superheavy syllables, (i.e., CVCC, CVVC and CCVC). The results also have shown that there are several consonantal phonemes that are undergoing sound change, (e.g., the sound change of the phonemic state of /ʔ/, the glides and the uvular /q/). In this section, the findings that are discussed in some depth are those that are related to the hypothesis of this study, (i.e., the innovation of CVCC, and the emergence of the vowel insertion). Narrowing the discussion to what the tested hypothesis enquires instead of expanding it to what have been found allows me to focus on what I have taken a

commitment to investigate. Therefore, two subsections appear next. The first discusses the emergence of the vowel epenthesis and the second discusses the innovation of CVCC.

4.4.1 The vowel epenthesis

As has been seen before, the data demonstrated that the modern epenthesis can be traced. Evidently in the seventh century an insertion for the round /u/ appears in 18.33 % of the investigated 60 stems. In this subsection, I discuss the following issues, firstly, the origin of the vowel epenthesis process. Secondly, the role of analogy in the emergence of the vowel insertion is explained. Thirdly, I argue that the insertion of the vowel /u/ has expanded systematically.

4.4.1.1 The origin of the vowel epenthesis process

This section emphasizes that the insertion of the round vowel /u/ is the origin of the modern epenthesis vowel. This is done by showing that the epenthesis of the round vowel /u/, which is found in the Qur'anic readings, is evidently a limited application of the modern epenthetic vowels.

The insertion of the round vowel /u/ that was found in the Qur'anic readings mirrors the modern epenthesis in a way that confirms that the two are forming one pathway of change. Several substantiations sustain this conclusion. Firstly, from a functional perspective, the two epenthesis processes prevent the surface of underlying consonants cluster in monosyllabic nominal stems. Hence, they both prevent the realization of CVCC syllable type. In the classical era, the avoidance of surfacing the cluster, however, was limited to when pausing some words with the فُعْل CuCC underlying sequence. In contrast, within the modern era, the epenthesis expands to more stems of CuCC and patterns of CVCC. Hence, it is not restricted to فُعْل CuCC, rather the patterns فِعْل CiCC and فَعْل CaCC are also targeted with a vowel insertion.

As for the investigated 20 stems of CuCC type, whereas the CuCC data of the seventh century display the operation of the vowel insertion in only specific 11 stems, some modern dialects, (i.e., IBA) has a stem-form for each of these 20 investigated stems that displays the vowel insertion. Therefore, CuCC stems such as [ʃukr-V] "gratitude" and [duhn-V] "fat" are surfaced as [ʃuk*u*r] "gratitude" and [dih*i*n] in IBA but in the seventh century they surface without resolution as [ʃukr] and [duhn] when paused.

Accordingly, it is deduced that the vowel insertion process that is documented in most modern Arabic dialects has an antecedent, and this antecedent is the u-insertion. Although

154

this may be unique, given that the round vowel /u/ is marked as an epenthetic vowel (see: Lombardi 2002), however, evidently the insertion was obeying vowel harmony in the early era since it is a copy of the lexical vowel of CuCC.

As for the patterns CaCC and CiCC, it was among the findings that inserting a vowel to break up the final-CC is in the data of the modern era but not the classical era. For example, the underlying /siħr/ "magic" surfaces as [siħir] in IBA and KħA whereas in the classical era it surfaces without i-insertion when pausing, (i.e., [siħr]).

Consequently, because the u-insertion began in the pausal position the relationship between the emergence of the vowel insertion and the loss of case vocalic markers is confirmed. As illustrated, in the classical era the pausal position is the unmarked position for final -CC that results because the vocalic case endings are deleted. Hence, case endings are deleted in pausal position, CVCC surfaces mainly in pausal position and the discovered u-insertion originated in pausal position. Therefore, the tested hypothesis is valid.

4.4.1.2 The role of analogy in the origin of the vowel insertion

Owens (1998b: 218), utilizing a verbal example that is extracted from Sibawaih's book (d. 180/796); introduces a connection between a vowel that surfaces in this verbal example and the epenthesis in the modern Arabic dialect. Owens bases the connection on a similarity observed between this vowel and the epenthetic vowel. However, it is observed that in this verbal example, (i.e., a geminate monosyllabic verbal stem) the vowel of interest has a morphological function not a phonological function. Thus, the similarity between the two vowels does not include the function. However, I argue that the similarity between the two vowels, the morphological and the epenthetic, justifies the postulation that the emergence of u-insertion is due to analogy with this morphological vowel. A main justification for this postulation is that the epenthetic vowels of the modern era morphologically seem to have the same function in building word-structures.

Owens' extracted verbal example belongs to the most common variation in the classical era; hence, it is from SA (see 3.5.2 in chapter three). Categorically, within ALT establishments, the verb is classified among الفعل المضعف *Al-fiʕl Al-Mudʕaʕʕaf* "the geminate verbal class". The argument that is introduced and explained here is that in the classical period the insertion of /u/ was developed in conformity with what the system of the language already has. Thus, u-insertion is developed through *analogy* with the morphological vowel that is systematically operated in *Al-fiʕl Al-Mudʕaʕʕaf* "the geminate verbal class".

To demonstrate the previous argument, I present Owens' (1998b: 218) example, which is 'radd-tu→radad-tu 'I returned' (*Kitāb*, II: ch. 560)' and other conjugated-forms of the same verbal root. The word '*radad-tu*' is a *verbal* word that has a monosyllabic root that categorically classified to *Al-fiʕl Al-Mudˁaʕˁaf* "the geminate verbal class". What signifies the geminate verbal class is that all its verbs consist underlyingly of a final geminate -C_iC_i. However, the geminate in this class, due to a morphological process of a word-formation nature, undergoes what is termed in ALT as فك الإدغام *Fakku Al-ʔidɣaam* which may be best translated as "degemination". The conjugated-forms of each verb of this class display both processes the gemination and degemination. Therefore, the Western phonology, as far as I know, would question the authenticity of such geminate. Nonetheless, in ALT that the two processes are operating morphologically in a paradigm of a CVC_iC_i stem would still make us consider the C_iC_i a geminate structure. This theoretical distinction is overlooked and is not pursued in this study. Yet, it is mentioned here because I do not know how Arabicists theoretically are introducing this verbal class within WL establishments.

According to the standardization of this class of verbs, the vowel in Owens' verbal past tense example does not show an epenthesis process that is provoked for a phonological function. Rather, it is displaying a known degemination process which systematically operates to generate different conjugated-forms of a CVC_iC_i stem. To explain, consider the following conjugated-forms that appear in (6), (7) and (8), which all are conjugations of /rudd/ (the segments of interest are boldfaced and Owens's example is re-transcribed in 6h):

The past tense + subject:

(6a) 1Pers.Sing /rudd+tu/→[ra**dad**-tu]
(6b) 1Pers.Plur /rudd+naa/→[ra**dd**-naa]
(6c) 2Pers.Sing.Masc /rudd+ta/→[ra**dad**-ta]
(6d) 2Pers.Sing.Fem /rudd+ti/→[ra**dad**-ti]
(6e) 2Pers.Dul /rudd+ttumaa/→[ra**dad**-ttumaa]
(6f) 2Pers.Plur.Masc /rudd+ttum/→[ra**dad**-ttum]
(6g) 2Pers.Plur.Fem /rudd+ttunna/→[ra**dad**-ttunna]
(6h) 3Pers.Sing.Masc /rudd+a/→[ra**dd**-a]
(6i) 3Pers.Sing.Fem /rudd+at/→[ra**dd**-at]
(6j) 3Pers.Dul.Masc /rudd+aa/→[ra**dd**-aa]
(6k) 3Pers.Dul.Fem /rudd+taa/→[ra**dd**-taa]
(6l) 3Pers.Plur.Masc /rudd+uu/→[ra**dd**-uu]
(6m) 3Pers.Plur.Fem /rudd+tunna/→[ra**dad**-tunna]

The present tense + subject

(7a) 1Pers.Sing /ʔa+rudd+u/→[ʔa-ru**dd**-u]
(7b) 1Pers.Plur /na+rudd+u/→[na-ru**dd**-u]
(7c) 2Pers.Sing.Masc /ta+rudd+u/→[ta-ru**dd**-u]

(7d) 2Pers.Sing.Fem   /ta-rudd+iina/→[ta-ru**dd**-iina]
(7e) 2Pers.Dul   /ta+rudd+aani/→[ta-ru**dd**-aani]
(7f) 2Pers.Plur.Masc   /ta+rudd+uuna]→[ta-ru**dd**-uuna]
(7g) 2Pers.Plur.Fem   /ta+rudd+na]→[ta-<u>r**dud**</u>-na]
(7h) 3Pers.Sing.Masc   /ja+rudd+u/→[ja-ru**dd**-u]
(7i) 3Pers.Sing.Fem   /ta+rudd+u/→[ta-ru**dd**-u]
(7j) 3Pers.Dul.Masc   /ja-rudd+aani/→[ja-ru**dd**-aani]
(7k) 3Pers.Dul.Fem   /ta-rudd+aani/→[ta-ru**dd**-aani]
(7l) 3Pers.Plur.Masc   /ja-rudd+uuna/→[ja-ru**dd**-uuna]
(7m) 3Pers.Plur.Fem   /ja+rudd+na/→[ja-<u>r**dud**</u>-na]

The imperative + subject

(8a) 2Pers.Sing.Masc   /(ʔu)+rudd+(a)/→[ʔu-<u>r**dud**</u>] and [ru**dd-a**]
(8b) 2Pers.Sing.Fem   /rudd+ii/→[ru**dd**-ii]
(8c) 2Pers.Dul   /rudd+aa/→[ru**dd**-aa]
(8d) 2Pers.Plur.Masc   /rudd+uu/→[ru**dd**-uu]
(8e) 2Pers.Plur.Fem   /ʔu-rudd+na/→[ʔu-<u>r**dud**</u>-naa]

The objective in introducing these conjugated-forms is to demonstrate that the morphological vowel /a/ in Owens' verbal past example does not have a phonological function; hence, it is not epenthetic vowel. The examples show that the underlying C_iC_i surfaces in some conjugated-forms and in others it undergoes degemination. The conjugated-forms of /rudd/ above present an example of the known systematic pattern of the verbal geminate class in SA. Hence, surfacing the geminate or breaking it through a degemination morphologically has the function of generating conjugated-forms of verbal monosyllabic roots of the type CVC_iC_i. Notably, the surfaced vowel in the morphological forms of the past tense of the verb /rudd/ "return" is [a] in the surfaced-forms that display a degemination for the C_iC_i, whereas it is [u] in the forms of the present and imperative. Therefore, the vowel that is involved in the degemination is structurally functional, and consistent in term of its phonetic value and its locus, (i.e., between the C_iC_i). Regarding the value of the underlying root-vowel, I assume that it is [u] because this vowel surfaces in all the imperative and present conjugated-forms in contrast to [a] which surfaces mainly in the past conjugated-forms of /rudd/.

However, in his later work, I found that Owens (2006: 108, footnote 31) brings the same verbal root but in the imperative conjugated-forms and he informs about its different classical variations. This time he introduces the vowel that is operating *after* the geminate as 'epenthetic not functional'. Owens says:

An identical rule with a part the epenthetic insertion contexts is attested in Sibawaih (II: 163, ch. 409). Discussing the imperative of doubled verbs which

have a third person singular object suffix, Sibawaih notes that non-Hijazi speakers add a vowel between verb and stem. The vowel is harmonic with that of the pronominal suffix, so that one has *rudd-a-haa* 'return it.F' and *rudd-u-hu* 'return it.M'. That the vowel is epenthetic not functional, is clear from the Hijazi alternative, *urdud-haa*, where the Hijazi segmentation (essentially (14a) above) does not require epenthesis before the object suffix.

(Owens, 2006: 108, footnote 31)

Upon checking Haaruun's edition of Sibawaih's book, I think the chapter that appears in the pages 529-535 of vol.3 is compatible with what Owens (2006) is referring to. By examining this chapter, which is concerned with the geminate class of verbs that was introduced above, I found inaccuracies in Owens' (2006) quotation. However, pre-explaining them, it should be emphasized that the term 'doubled verbs' in the quotation is Owens' translation for the term الفعل المضعف which is translated here as "the geminate verbal class". Firstly, Owens (2006) changes the focus of Sibawaih's observation to mainly the imperative inflected-forms of this class of verbs claiming that the vowel is inserted between a stem and a suffix, whereas Sibawaih's words were introducing the geminate verbal class in general, expounding about the gemination and degemination in both stem-form and inflected-forms in this class of verbs and offering examples from different variations of his era. In addition, I think Owens, in terms of the locus, claims that this vowel is added between a stem and a suffix. He specifies the pronominal object suffixes [-haa] and [-hu] and illustrates what he thinks that it is a vowel harmony between the nucleus of the two suffixes and what he argues to be epenthetic vowels. Thus, for Owens the epenthetic vowel in '*rudd-a-haa*' is [a] whereas it is [u] in '*rudd-u-hu*'. However, the two vowels are part of the stem. The structure '*rudd-a-haa*' is a SA structure, thus the vowel [a] is known to surface even if there was no [-haa] attached. The example (8a) [rudd-a] "return.Imparative.2Pers.Sing.Masc" is the stem in Owens's '*rudd-a-haa*'. The vowel [a], which Owens argues to be epenthetic, has the function of expressing masculinity. This function for [-a] can be seen also in the past conjugated-form in 6h, (i.e., [ra**dd**-a]). However, [a] and the preceding C_i gets deleted when pausing; hence, [rudd-a] and [radd-a] surfaces as [rud] and [rad] in pause. Therefore, whereas contextually the morpheme [-a] is the masculine morpheme, in pause the masculine gender is marked through Zero morpheme. The deletion of [-a] morpheme and the final C_i are not gender markers rather they are markers for pause. As for the structure '*rudd-u-hu*', I did not find it among the transcribed examples in Sibawaih's text though it is understood from Sibawaih's illustrations (see: Haaruun's edition, 2009: vol. 3, p.532). The vowel [u] is also part of the stem as will be seen when explaining what Sibawaih was saying about the geminate verbal

158

class. Another note about Owens' quotation is related to the example that appears in Sibawaih being attributed to Hijazi dialect, searching the text, I did not find it attached to a pronominal suffix in the specified pages; rather, it was 'اردُد الرجلَ' (Haaruun's edition, vol.3: 530). This can be transcribed as [ʔu-rdud ʔa-rraʒul-a] "return.imparative.2Pers.Sing.Masc the.man.Acc". The Hijazi CVC$_i$C$_i$ verb, based on this sentence, is [ʔu-rdud] which also belongs to SA (see: 8a). Thus, I know that the conjugated-form 'urdud-haa' "return.imparative.2Pers.Sing.Masc-3Pers.Sing.Fem", which Owens is giving instead, is a grammatical realization. Finally, there is No '(14a) above' in Owens own (2006) where he is referring his readers. Upon checking, Owens own book, I found that there is mainly '(14)'. As for the content of '(14)', it does not support or explain Owens as far as I understand. Next Sibawaih's words are summarized for clarification and to prove the argument that the u-insertion which operates in nominal CVCC emerged from analogy with the morphological vowel that operates in verbal CVC$_i$C$_i$.

Sibawaih in the specific chapter is introducing variations for the realization of the verbal geminate class. The variations that he gives examples from are Hijazi, بنو تميم Banuu Tamiim, Bakru bin Waaʔil, 'غيرهم من العرب، و هم كثير' which is an expression that means "other than them of Arabs, and these are many" and variations without naming a dialect. The exemplified data which Sibawaih used most often in his text is /rudd/ "retain". The conjugated-form "return.Imparative.2Pers.Sing.Masc" as far as Sibawaih's text has the following realizations:

9a. Hijazi: [ʔu-rdud].
9b. Most of the Arabs including Banuu Tamiim they surface the structure CVC$_i$C$_i$V. Yet, lexically this structure surfaces as [rudda] and [ruddu].

Sibawaih illustrates that those Arabs who pronounce [r**u**dd**u**] for /rudd/ they also pronounce [f**i**rr**i**] for /firr/ "escape" and [ʕad̥ʕd̥**a**] for /ʕad̥ʕd̥/ "bite" to form Imperative.2Pers.Sing.Masc. As can be seen, these pronunciations for the different roots show vowel harmony between the root-vowel and the stem-vowel. The vowel harmony appears in some conjugated-forms of the Impaerative.2Pers.Sing.Masc stem and is blocked in others. The vowel harmony is blocked in the conjugated-forms that are formed by combining the stem with the pronominal object suffixes [-haa] "3Pers.Sing.Fem" and [-hu] "3Pers.Sing.Masc". Sibawaih gives examples for this blocking and informs about his tutor's answer that explains the reason behind the role of these two suffixes in the blocking. According to Sibawaih, the stem-vowel surfaces always as [a] when being attached to [-haa] whereas it surfaces as [u] when being attached to [-hu]. Thus, in contrast to what Owens thinks, what Sibawaih is saying is that the vowel harmony is

blocked with these two pronominal object suffixes not invoked. Yet, Al-khaliil, Sibawaih's tutor, as far as I understood his answer, says that the vowel harmony does not appear also when inflecting with the subject pronominal suffix [-uu]. The examples in Al-khaliil's answer are [mudd-uu] "extend.Imperative.2Pers.Plur.Masc" and [ʕadˤdˤ-uu] "bite.Imperative.2Pers.Plur.Masc". Nonetheless, the exact examples that Sibawaih gives for those that display the vowel harmony are the conjugated-forms that are formed by combining the following:

(a) The Imperative.2Pers.Sing.Masc stem with the pronominal object suffix [-naa] "1Pers.Plur". His examples are [r**u**dd-**u**-naa] "retain.Imperative.2Pers.Sing.Masc us" and [ʕa**dˤ**dˤ-**a**-naa] "bite.Imperative.2Pers.Sing.Masc us".

(b) The Imperative.2Pers.Sing.Masc with the pronominal object suffix [-ii] "1Pers.Sing". Sibawaih's example is [m**u**dd-**u**-*n*ii ʔilaj-k] "extend.Imperative.2Pers.Sing.Masc.me to.you.Sing". The italic nasal [n] is termed in ALT نون الوقاية *Nuun ʔal-wiqaajah* "the protector n". It appears preceding the pronominal object suffixes [-naa] and [-ii] occasionally. As far as ALT, [n] is inserted for specific function that is overlooked here because of it non-relevancy to the argument.

(c) The Present.3Pers.Sing.Masc with the pronominal object [-kum] "2Pers.Plur.Masc". Sibawaih's example are the sentence [laa ju-ʃill-**i**-kum ʔalˤlˤaah-u] "No paralyze.Present.3Pers.Sing.Masc.You.Plur.Masc ALLAH" and the word [li-ja-ʕa**dˤ**dˤ-**a**-kum] "so that.bite.Present.3Pers.Sing.Masc.You.Sing.Masc".

(d) The Present.3Pers.Sing.Masc with the pronominal object [-k]. There is no diacritic that marks the velar [k] in Haaruun's edition. Thus, I do not know whether in this example Sibawaih was intending the 2Pers.Sing.Fem, (i.e.,كِ [-ki]) or the 2Pers.Sing.Masc, (i.e., كَ [-ka]). There is also the possibility that he intended the two suffixes. Nonetheless the example that appears in his text is the sentence 'لا يُشِلِّك الله'. The stem that appears in this sentence is the same as the stem that appears in the sentence in (c). Just like (c), the stem here also displays two front vowels.

Critically evaluating Sibawaih's words and data make ones see that there were two main patterns to form the Imperative.2Pers.Sing.Masc of the geminate verbal class. The first pattern surfaces a geminate, (i.e., many Arabs including Banuu Tamiim). The second pattern the geminate undergoes degemination, (i.e., Hijazi dialect). Sibawaih states that the reason for the degemination in Hijazi is because لأنَّهم أسكنوا الآخر، فلم يكن بُدُّ من تحريك الذي قبله؛ لأنه لا يلتقى ساكنان.' which means "this is because they [i.e., Hijazi people] pronounced the final C_i processed by *sukuun* which necessities processing the first C_i with a vowel because two

consonants processed with *sukuun* cannot be adjacent". The reason that Sibawaih gives shows that he thinks that the Hijazi people are conscious of their degemination act. Thus, this contrasts the WL notion that humans have tacit knowledge about their languages that were acquired independently of conscious efforts. I do not follow Sibawaih in the reason that he gives. Rather, since Hijazi allows C_iC_i to surface in other word-structures then I assume that there is another reason that explains the Hijazi pronunciation. Based on the establishments of WL, I argue that the following explanation is more accurate.

According to Alkhatiib (2003: 106-109), there are two patterns to form the Imperative.2Pers.Sing.Masc in Arabic that were distinguished based on an ALT establishments. However, the WL establishments recognize more patterns. The examples in (10), (11), (12), (13) and (14) present Imperative.2Pers.Sing.Masc of five verbal categories that I know. Observe that (12) is the geminate verbal category.

(10) Tri-consonantal ʔasˤ-sˤaħiiħ ʔas-saalim verbs الصحيح السالم الثلاثي

(10a) [ʔi-ʒlis]   "set".
(10b) [ʔu-ktub]   "write".
(10c) [ʔu-qtul]   "kill".
(10d) [ʔi-fraħ]   "cheer up".
(10e) [ʔi-qraʔ]   "read".

(11) The four-consonantal ʔasˤ-sˤaħiiħ ʔas-saalim verbs الصحيح السالم الرباعي:

(11a) [baʕθir]   "scatter".
(11b) [daħriʒ]   "roll".
(11c) [ʔi-ntˤaliq]   "dash".
(11d) [ʔi-staxriʒ]   "dig up".

(12) The geminate verbs (the tri-consonantal and the four-consonantal) الفعل المضعف :

(12a) (in tri-consonantal) [ʃudd-a]≈[ʃudd-i]≈[ʃuddu]≈[ʔu-ʃdud] "pull".
(12b) (in four-consonantal) [zalzil] "rocks"   [qahqih] "giggle".

(13) The verbs with the glottal stops المهموز:

(13a) ʔ root-initial: [xuð]   "tack",   [mur] "command".
(13b) ʔ root-middle: [sal]≈[ʔi-sʔal] "ask".
(13c) ʔ root-final: [ʔi-qraʔ]   "read".

(14) ʔal-muʕtal verbs الأفعال المعتلة, (i.e., those that their roots have /w/, /j/ or /aa/):

(14a) root-initial: [ʕid] "promise",   [ʒid] "find",   [jassir] "make it easy".
(14b) root-middle: [qul] "say",   [biʕ] "sell",   [zid] "increase".
(14c) root-final: [ʔi-qdˤi] "adjudicate",   [ʔu-dʕu] "pray",   [ʔi-xʃa] "be afraid".
(14d) the root has more than the specified segments: [qi] "to shelter", [ʕi] "be aware",
  [qawwi] "re-enforce", [ʔi-tˤwi] "fold".

By comparing the Hijazi [ʔu-ʃdud] in (12c) and the discussed [ʔu-rdud] with the other examples, it can be seen that the imperative geminate Hijazi class is consistent with all the examples in (10), (11c), (11d), (13c) [ʔi-sʔal] in (13b), (14c). Thus, I think that Hijazi people form the imperative geminate class based on the most generated syllabic structure for the imperative in Arabic, (i.e., ʔV-CCVC structure).

On the other hand, I argue that u-insertion emerged from analogy with the word-formation of geminate *verbal* words not geminate *nominal* words. Even though both classes of words exist in Arabic but the asymmetries between them prove that the analogy was with the verbal class not the nominal. To illustrate the asymmetries the paradigm of the nominal geminate root /dub/ "bear" and the paradigm of the past tense of /rudd/ inflected with the subject pronominal suffixes are reintroduced below in their usual complete set.

Contextually: The nominal stem-forms realizations   when pausing

(15a) [dubb-u-n]   "bear.NOM.Indef"   [dub]
(15b) [dubb-i-n]   "bear.GEN.Indef"   [dub]
(15c) [dubb-a-n]   "bear.ACC.Indef"   [dubb-aa]
(15d) [ʔal-dubb-u] "bear.NOM.definite"   [ʔal-dub]
(15e) [ʔal-dubb-i] "bear.GEN.definite"   [ʔal-dub]
(15f) [ʔal-dubb-a] "bear.ACC.definite"   [ʔal-dub]

Contextually: The nominal inflected-forms realizations   when pausing
(15g) [dubb-ii]   "1Pers.Sing"   [dubb-i]
(15h) [dubb-V-naa]   "Case.1Pers.Plur"   [dubb-V-na]
(15i) [dubb-V-ka]   "Case.2Pers.Sing.Masc"   [dubb-V-k]
(15j) [dubb-V-ki]   "Case.2Pers.Sing.Fem"   [dubb-V-k]
(15k) [dubb-V-kumaa]   "Case.2Pers.dual"   [dubb-V-kuma]
(15l) [dubb-V-kum]   "Case.2Pers.Plur.Mase"   [dubb-V-kum]
(15m) [dubb-V-kunna]   "Case.2Pers.Plur.Fem"   [dubb-V-kun]
(15n) [dubb-V-hu]   "Case.3Pers.Sing.Masc"   [dubb-V-h]
(15o) [dubb-V-haa]   "Case.3Pers.Sing.Fem"   [dubb-V-ha]
(15p) [dubb-V-humaa]   "Case.3Pers.dual"   [dubb-V-huma]
(15q) [dubb-V-hum]   "Case.3Pers.Plur.Mase"   [dubb-V-hum]
(15r) [dubb-V-hunna]   "Case.3Pers.Plur.Fem"   [dubb-V-hun]

Contextually the past tense verbal realizations   when pausing
The past tense + subject:

(16a) 1Pers.Sing   [ra**dad**-tu]   [radad-t]
(16b) 1Pers.Plur   [radd-naa]   [radd-naa]
(16c) 2Pers.Sing.Masc   [ra**dad**-ta]   [radad-t]
(16d) 2Pers.Sing.Fem   [ra**dad**-ti]   [radad-t]
(16e) 2Pers.Dul   [ra**dad**-ttumaa]   [radad-ttumaa]
(16f) 2Pers.Plur.Masc   [ra**dad**-ttum]   [radad-ttum]
(16g) 2Pers.Plur.Fem   [ra**dad**-ttunna]   [radad-ttunna]
(16h) 3Pers.Sing.Masc   [radd-a]   [rad]

(16i) 3Pers.Sing.Fem   [radd-at]   [radd-at]
(16j) 3Pers.Dul.Masc   [radd-aa]   [radd-aa]
(16k) 3Pers.Dul.Fem   [radd-taa]   [radd-taa]
(16l) 3Pers.Plur.Masc   [radd-uu]   [radd-uu]
(16m) 3Pers.Plur.Fem   [ra**dad**-tunna]   [radad-tun]

By comparing the nominal realizations in (15) with the verbal realizations in (16) of the string CVC_iC_i symmetries and asymmetries can be seen. These symmetries and asymmetries are introduced below:

(i) The nominal CVC_iC_i does not display degemination in any surfaced-form. This is contrasts with the verbal stem as there are 14 surfaced-forms that display the degemination, (i.e., 16a, 16c, 16d, 16e, 16f, 16g and 16m contextually and in pausing).

(ii) Surfacing a CVC realization instead of the underlying CVC_iC_i appears in 5 nominal pausal forms, (i.e., 15a, 15b, 15e, 15d and 15f) whereas it appears only once in the verbal stem, (i.e., the pausal form of 16h).

(iii) All the nominal contextual forms of CVC_iC_i surface the underlying geminate. However, only 6 verbal contextual forms of CVC_iC_i surface the geminate. In contrast, only 5 nominal pausal forms that do not surface the geminate whereas there are 8 verbal pausal forms that do not surface the geminate.

Accordingly, the verbal CVC_iC_i data have a vowel intervening between its final C_iC_i not the nominal CVC_iC_i do not have this vowel. The significance about this is that the u-insertion operated in CC and has been developed in the modern dialects displaying similar systematic word-formation. The way in which the degemination is operating in a paradigm displays consistency that is observed in the modern Arabic dialects. This is because the grammar of the modern Arabic dialects display that the epenthetic vowels, synchronically, are not inserted. Rather, they appear part of the abstract structures. On the other hand, the symmetries and asymmetries that are confirmed above between the nominal and verbal words in Arabic sustains what has been mentioned before in this thesis about the need for caution when forming generalizations that include nominal and verbal data.

4.4.1.3 The expansion of the vowel epenthesis

There are several substantiations that demonstrate the expansion of the vowel epenthesis. Firstly, the vowel insertion in the seventh century was operating in limitation in contrast to the modern era. Secondly, the epenthetic vowels do not behave in the modern era as epenthetic vowels. Rather, synchronically they display more interaction in the grammar of the language in particular for IBA, ECA and KħA. Thirdly, from existing literature, (i.e.,

Owens, 2006: 109), there are modern Arabic dialects that exhibit a middle vowel insertion. For example, according to Owens (2006: 108-109) the word *gahwa* "coffee" would surface as *gahawa* in some modern Arabic dialects. The realization *gahawa* is significant not only because it is less known realization but also because of the middle insertion of the vowel /a/ that surface between the fricative /h/ and the glide /w/. The Arabs of Sabhaa, which is a region in the south of Libya, articulate *gahawa* as far as my friend[13]. She also provided me with the following nominal example *raħma→raħama* "mercy". This middle vowel insertion is argued to be another extending usage for the u-insertion. Such words show the modern vowel-insertion in some dialect may be moving towards banning the realization of coda and not mainly after simplifying a complex coda. Non-formally, it is observed that the dialect of Sabhaa exhibits the vowel insertion in the stem-form and inflected-forms to prevent the realization of CVCC in a pattern that is very similar to the IBA. However, some inflected-forms display a vowel insertion that seems to be targeting the coda. Thus, there is the possibility that in the long future that phonology might develop an Arabic grammar that bans consonantal adjacency.

4.4.2 The innovation of CVCC syllable type

Two subsections appear next. In 4.4.2.1 the evolution of CVCC syllable type is discussed. The focus is on the state of this syllable type in the investigated modern Arabic data, in particular, the data show that it is accommodated. In 4.4.2.2 the metathesis resolutions in particular the case metathesis resolution is given some attention.

4.4.2.1 The evolution of CVCC

The evolution of CVCC syllable type was in the pausal position in a sentence. This evolution started centuries ago as we evidently know from the collected data of the seventh century. Thus, its state in the modern era is of worth of investigation particularly that the modern collected data display that some modern Arabic dialects have already accommodated it within their grammars, (i.e., KħA, MMA and ECA). Considering the type of data that is collected, I still think that the state of this syllable is in need to be investigated in context; hence, in the phrase-level. To explain, observes, that what the informants of the modern collected data have articulated are stem-forms and inflected-forms, (i.e., words) without a context. Thus, in reality, the observations, conclusions and generalizations about the modern data is about mainly the pausal forms in these dialects. I argue that the realization of CVCC

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contextually is still in some Arabic dialects limited to the pausal position. To verify this argument, the following contextual examples from KħA and ECA are discussed in brief. The monosyllabic word that surfaces contextually in the examples (12) and (13) is /bint/ "girl".

The realizations that appear in (12a) and (13a) are KħA whereas those that appear in (12b) and (13b) are ECA. The underlying structures that are suggested for both examples are SA realization; hence, it the realization of the majority of Arabs in the classical era.

12 /naama-t   bint-u ʒiiraan-i-him/   SA
 Slept.3Pers.Sing.Fem girl.NOM neighbourhood.Gen.3Pers.Plur.Masc

12a [naama-t   bint ʒiiraan-hum]   KħA
 Slept.3Pers.Sing.Fem girl neighbourhood.3Pers.Plur

12b [bint*i* giran-hum   naami-t]   ECA
 Girl neighbourhood.3Pers.Plur. slept.3Pers.Sing.Fem

The English translation: "their neighbourhood's girl slept"

13/naama-t   bint-u ʔal-ʒiiraan-i/   SA
 Slept.3Pers.Sing.Fem girl.NOM the.neighbourhood.Gen.Plur

13a [naama-t   bint il-ʒiiraan]   KħA
 Slept.3Pers.Sing.Fem girl the.neighbourhood.Plur

13b [bint il-giraan   naamit]   ECA
 girl the.neighbourhood.Plur slept.3Pers.Sing.Fem

The English translation: "The neighbourhood's girl slept"

In contrast to KħA, ECA dialect accommodates the innovation of the superheavy syllable mainly in the pausal position without extending to the contextual position. The following explains the examples that are taken as evidence for the above conclusion.
The insertion of [i] in (12b) is a substantiation that ECA does not allow contextually the CVCC syllable to be realized. Thus, unless a morphological resolution, (i.e., [il-] "the"), appears to prevent the syllabic complexity from surfacing (13b), an epenthetic vowel would be provoked in ECA. This contrast with KħA as (12a) shows that the phonology of this dialect does not resolve the superheavy CVCC syllable. This act of phonology indicates that this syllable is not restricted to the pausal position in KħA. Consequently, the morphological affix in (13a), (i.e., [il] "the") should not be interpreted as a morphological resolution in this dialect for CVCC.

On the other hand, it was noticed that in contrast to SA and KħA, ECA has lost the VSO order. Bearing in mind that the verb [naama-t] "slept.3Pers.Sing.Fem" is intransitive, the informant of ECA data in (12b) and (13b) provided a SV order for VS underlying structures. I was informed when trying to illustrate that I want the same word-order that I give in SA that the VS order that I am requesting is ungrammatical in ECA. Thus, the English translation is more compatible to the ECA not SA and KħA. This is because SA and KħA syntactically surface both word-order patterns; semantically each pattern makes different emphasis.

4.4.2.2 The resolution of CVCC

The resolution of CVCC syllable type was not only through vowel insertion. Among the resolutions are two types of metathesis. The first is a case-metathesis which is documented in the eight century but was not found in the data of the seventh century. The second is the root-metathesis which is observed mainly in the modern era and only in MMA. However, what is more related to the scope of this study is the documented case-metathesis, (i.e., NOM-metathesis and GEN-metathesis). A question about the traces of NOM-metathesis and GEN-metathesis is of considerable importance. To explain, I have introduced all the intervening vowels that are not part of the CVCC roots in the modern collected data as epenthetic. Such interpretation excludes the possibility that some of these vowels may not be a result of insertion; rather, some of these vowels might be case-metathesized vowels in particular the [u] and [i]. Therefore, some attention is given here to find out if there is evidence for traces for the case-metathesis of the eight century in the modern data.

The documentation that informed about the case metathesis is Sibawaih's book. According to Sibawaih (d. 180/796), when pausing nominal words such as /bakr-V/ "a person name", some native Arab speakers would surface [bakur] in a nominative pausal realization and [bakir] in genitive pausal realization. This is understood to be indicating that these Arabs switch between NOM and GEN vocalic markers and the adjacent final consonant. Sibawaih further states that this is restricted to the nominative and genitive markers. Hence, according to him the accusative pausal *[bakar] does not exist in the eight century. Sibawaih was also found introducing the *following* process. The examples that he gives for this process are in (17b), (18b), (19b) and (20b) whereas the underlying inputs that I assume based on SA are in (17a), (18a) (19a), and (20a):

(17a) /haaðaa ʕidl-u-n wa fisl-u-n/
(17b) [haaðaa ʕid*i*l wa fis*i*l]
"This is the equal, and [this is] the fool"

(18a) /fii ʔal-busr-i/
(18b) [fi l-b<u>us</u>*u*r]
"In the dates"
(19a) /raʔaj-tu ʔal-ʕikm-a/
(19b) [raʔaj-tu l-ʕi<u>ik</u>*i*m]
"I saw the cloth."

(20a) /raʔaj-tu ʔal-ʒuħr-a/
(20b) [raʔaj-tu l-ʒu<u>ħ</u>*u*r]
"I saw the hole"

As can be seen from Sibawaih's examples, the *following* process does not display a relationship between the vowel that is intervening between the nominal monosyllabic roots and the case inflection. Rather, the relationship that is noticed is between the root-vowel and the intervening vowel. For instance, the examples in (17b) display words marked with the nominative markers but the NOM marker [u] is not the one that is intervening; rather, the intervening vowel is a copy from the front root-vowel. The same can be seen in all the other examples. Sibawaih is also understood to say that the following process is restricted to CuCC and CiCC stems. When discussing example (17b), he was found informing that in CiCC the intervening vowel cannot be [u] because ‘لأنّه ليس من كلامهم فِعُل’ "CiCuC is not part of their speech". When discussing (18b) he was found informing that in CuCC the intervening vowel cannot be [i] because ‘لأنّه ليس في الأسماء فُعِل’ "because in nominal words there is no CuCiC". This confirms that the limitation of u-insertion. It also implies that the resolutions NOM-metathesis and u-insertion would not be employed to repair CiCC nor GEN-metathesis and i-insertion to repair CuCC. When discussing (19b) and (20b) he was found informing that the pausal accusative of CuCC and CiCC surfaces a copy root-vowel intervening between the final CC. He deduces that this action is done after metathesizing NOM-u or GEN-i. Hence, he seems to think that in the accusative pausal one of the markers, either NOM-u or GEN-i, was surfacing. I disagree with him in this deduction. I think that (19b) and (20b) are not due to the case-metathesis processes; hence, I do not think that the intervening [i] in (19b) is GEN-i nor do I think that the intervening [u] in (20) is NOM-u. Rather, I think that these two intervening vowels are inserted following/copying the root vowel. Hence, I argue that pausal accusative CuCC and CiCC stems are environments for the vowel insertion resolution not case-metathesis.

Nonetheless, I enquired about the pronunciation of the nominal monosyllabic word /bakr/, which Sibawaih documents as an example for the NOM-metathesis and GEN-

metathesis. The significant pronunciation that proves that NOM-metathesis has a trace in modern era was found in Mecca Arabic.

(21a) [bakir]   in KℏA   (21b) [bakur] in Mecca Arabic[14] "a personal name"

As said before, the round vowel in (21b) is interesting because in contrast to all the findings of the classical era about inserting /u/ exclusively in a CuCC stem; this round vowel surfaces in a CaCC stem. Thus, I assume that traces of the NOM-metathesis are most probable in such data that surface /u/ in CaCC. As for (21a), the possibility that the boldfaced front [i] is due to the GEN-metathesis is as even as the possibility that it is due to i-insertion. This is because from what has been found about u-insertion and i-insertion of the seventh century it was expected that u-insertion would remain most probably limited to CuCC stems whereas i-insertion was developing to expand. The process i-insertion was found mainly in CuCC stems but it was anticipated that it will also be operated in CiCC stems. That i-insertion would expands to CaCC stems as well has a substantiation. The root /buxl/, which was discussed in (1) in table 4.2a, has the following realizations: [bi-l-buxl-i]≈[bi-l-bux*u*l-i]≈[bi-l-b*ax*al-i]≈[bi-l-b*ax*l-i]≈[bi-l-b*axi*l-i]≈[bi-l-b*i*xl-i]≈[bi-l-b*ixi*l-i]. The realization that displays a-substitution and i-insertion, (i.e., [bi-l-b*axi*l-i]) can be taken as evidence that i-insertion most probably operated in CaCC stems. Observe that there is no evidence for the vice versa as there is no a-insertion in the realizations that display i-substitution, (i.e., [bi-l-b*i*xl-i]≈[bi-l-b*ixi*l-i]).

Finally, what Sibawaih says about the accusative marker [a] in terms that it does not get metathesized in contrast to NOM-u and GEN-i sheds light in terms of what is the phonetic values that were inserted and what are metathesized. Based on his words, I think that the inserted phonetic values are: [u], [i] and [a] whereas the metathesized are mainly [u] and [i]. Thus, I argue that the boldfaced [a] in (22) and such data is an inserted vowel not metathesized.

22. [laℏam]   "meat"   KℏA and IBA

4.5 Conclusion

Significant findings were discovered when exploring the data in relation to the strategies that were employed by phonology to avoid complexity in final-codas. Based on these findings several generalizations were concluded. I mention here only the main ones. Firstly, the modern known epenthesis process is an expansion of a process of vowel epenthesis that was targeting only words that have the underlying string CuCC in the seventh century. The

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[14] I am grateful to my friend Ender Taher for this example.

insertion of the round /u/, which is operated in 18.33 %, is the concluded origin of the modern epenthesis process. Secondly, the role of analogy for the emergence of this u-insertion is demonstrated. Thirdly, the novelty of CVCC syllable type has been established. It has been demonstrated that this syllable is accommodated in different levels of grammar in some modern dialects, (i.e., ECA, KħA and MMA) and is prohibited in all levels in IBA.

Chapter 5
The ranking of the constraints
The generalizations expressed in Stratal OT words

5.1 Introduction

Several significant results have been obtained from the research which this study has carried out. These significant results have demonstrated the valid stance of the tested hypothesis as has been shown in the previous chapter. Several generalizations were concluded based on the collected data. In this chapter the aim is to articulate some of these generalizations within the descriptive tools of the Stratal version of Optimality Theory (Stratal OT). Yet, this articulation is formed based on a *tentative extrapolation*. I do not claim that the suggestions that appear in this chapter are final or conclusive. Rather, I argue that the suggestions may increase the understanding of the phonology and morphology of the Arabic language and the constraints that seem to be monitoring the change in this language. Theoretically, I benefit from the theoretical implementation of a moraic approach that was made by Bermúdez-Otero (1999) because it can contribute towards accounting for the generalizations that were formed.

Analytically, the core of what was discovered is that the developed new Arabic grammars, which resulted due to the loss of the vocalic markers, display a conflict between *syllable well-formedness* and *moraic conservatism*. The collected corpus consists mainly of the underlying CVCC root strings and their paradigms. This means that, morphologically, the corpus contains only words of the smallest nominal morphological unit in the Arabic language and their paradigms of both the classical era and the modern era. The idea was to contrast the realizations of the same words in the two different eras so that we can look at how the same words are realized after more than ten centuries. A main idiosyncrasy from the collected corpus that is immediately observed from the appendixes is that, in general, lexically the words of the past are so similar to their modern heirs and the modern heirs are so similar to each other, yet they all remain different. This idiosyncrasy that distinguishes the Arabic language in contrast to other world languages is what this analysis aims to shed lights on. This idiosyncrasy is argued to be due to the phenomenon that is termed here as <u>moraic conservatism</u> which is a type of mora preservation. The unique about this mora preservation is that the mora count of protoforms is preserved for a long time. This type of mora preservation is not limited to the Arabic language; rather, as will be mentioned in 5.2.3,

Bermúdez-Otero (1999: 171) has also discovered that there is preservation for the mora count of 'Germanic protoforms'.

Accordingly, this chapter is concerned with first summarizing the main critical points that were adopted from Bermúdez-Otero (1999). This is followed with a section that introduces the significance of moraic conservatism in Semitic languages through a contrast between Arabic and Hebrew. Then a brief evaluation for some previous theoretical approaches for the floating consonant in CVCC in the Arabic language is presented with the aim of providing an explanation for the advantages of an analysis in Stratal OT. The fifth section is focused on building a discussion in which I argue that there is a conflict between syllable well-formedness and moraic conservatism. Following this, a suggested theoretical analysis is developed within Stratal OT to account for some generalizations that were formed. Lastly, I conclude by summarizing the main points that were discussed in this chapter.

5.2 Bermúdez-Otero (1999)

This section introduces Bermúdez-Otero (1999) with a focus on the main aspects that are adopted for the proposed analysis in section 5.6. As will be seen, because the phenomenon is related deeply to mora the proposed analysis is based on a moraic approach. Bermúdez-Otero (1999) presents an implementation of a moraic approach within Stratal OT which is the framework that is used to articulate the generalizations theoretically. This section consists of three subsections, these are, section 5.2.1, which gives a general review on Bermúdez-Otero's (1999) work. The second section introduces the main adopted aspects from Bermúdez-Otero's (1999) implementation of moraic approach in Stratal OT. Finally, section 5.2.3 offers an overall.

5.2.1 A general review

In general, the work of Bermúdez-Otero (1999) presents a theoretical support for an interleaved theory of the grammar that is based on constraint-based analysis. This is done through an evaluation for several theoretical versions which are either interleaved versions or strictly parallel versions of OT. For the first type, Bermúdez-Otero gives the examples Lexical Phonology and Morphology in Optimality Theory (LPM-OT) by Kiparsky 1998 and Sign-Based Phonology and Morphology (SBPM) by Orgun 1996. For the second type, he specifies Sympathy Theory by McCarthy 1998 as an example (see Bermúdez-Otero, 1999: 17-18, chapters 3 and 4). Bermúdez-Otero (1999) applies several criteria to demonstrate his theoretical supportive view. These include the diachronic criterion, the synchronic criterion and the acquisition criterion. His focus was on addressing the interaction between opacity and

globality. Three main case-studies are the core of his attention. The first is synchronic and involves counter-bleeding opacity in Spanish. The second is diachronic and involves the West Germanic Gemination (WGG) and the Middle English Open Syllable Lengthening (MEOSL). Bermúdez-Otero's (1999) is a contribution that motivates refuting strongly parallel versions of OT and supports the interleaved framework Stratal OT. The diachronic case studies, (i.e., WGG and MEOSL) involve syllable quantity and phenomena of mora preservation; therefore, the moraic theoretical account that is developed by Bermúdez-Otero (1999) is thought to be appropriate to account for the generalizations that were formed based on the Arabic data.

5.2.2 Adopted aspects from Bermúdez-Otero (1999)

This study's concerns in Bermúdez-Otero's (1999) are focused on his implementation of a moraic approach in Stratal OT to account for data. I focus here, in brief, on the three adopted aspects of Bermúdez-Otero's implementation of the moraic approach. The first aspect is the model that he selects, (i.e., Hayes' moraic model). The second is his recognition for the difficulties that is related to short consonant's alternating prosodification because the initial formulations of the moraic faithfulness constraints DEP$^\mu$ and IDENT$^\mu$. The third is his suggested solutions for these difficulties, (i.e., introducing 'positional μ-licensing' and modifying the early versions of DEP$^\mu$ and IDENT$^\mu$ to form new equations that redefine them as *micro-constraints*).

5.2.2.1 Selecting a moraic model

Bermúdez-Otero (1999: 23) selects for length and quantity representations the 'Hayesian model' over a non-moraic representation, (i.e., X-position Theory), and over the other 'various flavours' of the moraic representation, (e.g., McCarthy & Prince 1986 and 1988). Under the implicit principle Rhyme Exhaustively, [15] the rhyme segments are parsed into morae. The representation of the word [dhaan] "fat" from MMA data below substitutes the representation of a hypothetical form that appears in Bermúdez-Otero (1999: 24 in 2,1b).

(1)
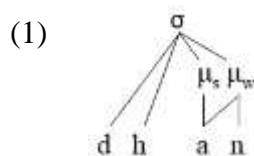
Assuming the 'micro-trochaicity' of rhyme structure, which is adopted from Prince 1990, Bermúdez-Otero (1999: 24) recognizes the leftmost mora of any syllable as its 'head mora' or

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[15] It 'rules that, within syllable boundaries, post-nuclear are exhaustively parsed into morae.'

'strong mora'. He also informs that 'a mora is said to be headed by the leftmost segment it dominates'. Therefore, in (1) μ_s and μ_w are morae headed by the segment [aa] and the head mora/strong mora is μ_s. The representation of syllables' onset as non-moraic is based on the grammatical assumptions of Weak Layering[16] and Proper Headedness[17].

Hayes' moraic model also expresses the contrast between codas in terms of their contributing to the syllable weight by mora sharing. A weight-contributing consonant coda heads its own mora whereas a weightless coda is adjoined to a mora that is headed by a different segment. Bermúdez-Otero (1999: 26) provides the following representations to illustrate this distinction.

(2a) σ
      /|\
     / μ_1 μ_2
    t a t

(2b) σ
      /\
     / μ
    t / \
      a   t

Bermúdez-Otero (1999: 26-27) points out that the adjoining of the weightless coda to the mora node that is headed by other segment has supports. The first support is from the phonetically experimental results of Broselow, Chen & Huffman 1997 on segmental duration. Another piece of evidence that supports it comes from the behavior of geminate consonants.

In the Hayesian model, (2a) represents a heavy CVC with an underlying coda that is a weight-contributing consonant because Weight by Position is 'active'. In contrast, (2b) represents a light CVC syllable as Weight by Position 'is set to 'off''. When Weight by Position 'is set to 'off'' 'an adjunction operation [...] links any remaining weightless consonants to an already existing node' (Bermúdez-Otero, 1999: 36-37).

According to Bermúdez-Otero (1999: 27-28) the interaction between a family of sonority-sensitive constraints on mora headship and *BRANCH is responsible on whether coda consonants are contributing to syllabic weight or not in his implementation for Hayes' model in OT. The constraint *BRANCH, 'requires that a mora should not dominate more than one root-node' whereas the constraints on mora headship are *μ/OBS 'A mora must be headed by an obstruent' and *μ/SON 'A mora must be headed by a sonorant consonant'. The non-moraicity of a weightless coda is recognized in other moraic models, (e.g., McCarthy & Prince 1986; Sherer 1994) but it is accounted for differently. In contrast to the Hayes' model, the weightless coda in such models will not be adjoined to a mora headed by other segment. Rather, the consonant will immediately be linked to a σ node. The OT frameworks that adopt

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[16] 'A prosodic unit of level n may immediately dominate prosodic units of levels lower than n-1'(Bermúdez-Otero,1999: 25).

[17] 'Every prosodic unit of level n must be headed by a prosodic unit of level n-1' (Bermúdez-Otero 1999:25).

such models uses the constraints WEIGHTBYPOSITION and *APPENDIX to perform the function of *BRANCH. The constraints WEIGHTBYPOSITION and *APPENDIX in these OT frameworks interacts with 'other constraints which require that segments attached to morae should be highly sonorous' (see Bermúdez-Otero, 1999: 27-28, footnote 8). Nonetheless, the privilege of mora sharing in Hayes' model is clear when considering the fact that the weightless consonant is not always an onset of an empty syllable that waits to be filled by some suffix. Rather, structurally, it may be part of a rhyme as a weightless coda. Through Adjunction to a mora headed by different segment the weightless coda is accounted for.

As for the segmental length, it is expressed categorically by the number of linkage that a segment has. A **short** vowel or consonant would be linked to only one prosodic node, a double linkage expresses a **long** vowel or consonant, the representations below appear in Bermúdez-Otero (1999: 29):

(3a) *short vowel*

μ
|
a

(3b) *long vowel*

μ μ
\ /
a

(3c) *short consonant*

ω
σ
μ
|
t or t or t
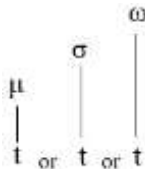
(3d) *long consonant*

σ
μ /
\/
t
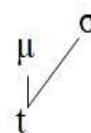
On the other hand, According to Bermúdez-Otero (1999) in Hayes' model the short vowels are monomoraic, long vowels are bimoraic and all short consonants are non-moraic. Regarding the long consonants, as far as Bermúdez-Otero (1999: 31), Hayes' model is 'less straightforward'. In his implementation for Hayes' model in OT, Bermúdez-Otero (1999) adjusts these assumptions so that they fit with the theoretical framework of OT. Since Inkelas' 1994 revised version of Lexicon Optimization is assumed, restriction is put upon underspecification. This is because Inkelas' Lexicon Optimization favours specification over underspecification in input representations. Therefore, from Hayes' model Bermúdez-Otero adopts the mono-moraicity of short vowels and the bimoraicity of long vowels as underlying specifications. In relation to the geminates, Bermúdez-Otero assumes that a geminate will be weight-contributing if it is allowed to head its own mora in the output representation. This distinction is explained in (4), where (4a) is a weight-contributing geminate since *tt* is

heading its own mora whereas (4b) is a weightless geminate as *tt* does not head a mora (the hypothetical data in 4 is from Bermúdez-Otero, 1999: 33: 2,20).
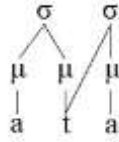
(4a)   (4b)

As for the short consonants, Bermúdez-Otero (1999: 36) points out that in OT

> Under the revised version of Lexicon Optimization, a major restriction upon underspecification becomes apparent: only predictable alternating structure may be left lexically unspecified (Inkelas 1994: 7). Trivially, all unpredictable or idiosyncratic information must be fully specified in the input. More interestingly, Lexicon Optimization also favours the full specification of predictable non-alternating structure, since this reduces the disparity between the input and output representations, leading to the best satisfaction of faithfulness constraints. Thus, underspecification becomes possible only when a morpheme has different (predictable) surface realizations for, in such cases, it is inevitable that at least one of the alternates will depart from the input representation.

In table '(2,15)' Bermúdez-Otero (1999: 30) reintroduces 'predictable alternating structure', 'unpredictable or idiosyncratic information', 'predictable non-alternating structure' within four categories. These categories are *predictable alternating*, *unpredictable alternating*, *predictable non-alternating* and *unpredictable non-alternating*. According to him they are all fully specified except the predictable alternating which can be either unspecified or fully specified. What Bermúdez-Otero means can be understood through a hypothetical example that he offers in (Bermúdez-Otero, 1999: 35: 2,22 & 2,23) which is re-transcribed as appear in the original source in (5) below.

(5) *Hypothetical surface alternates of a morpheme /ta:n/*

(5a) /ta:n-a/

175

(5b) /ta:n-ta/

σ   σ

μ μ   μ

t a n t a

(5c) /ta:n/

Σ

σ

μ μ
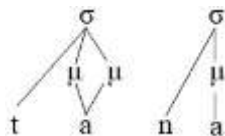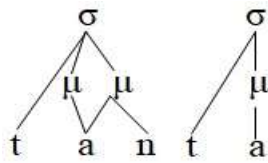
t a n
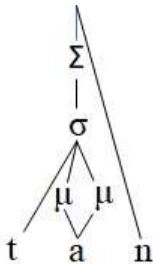
The morpheme base /ta:n/ in (5) has a short consonant with a prosodic versatility. This is the alternating short nasal consonant. The output representations in (5a), (5b) and (5c) show that the nasal is linked to different prosodic nodes depending on the structure. When the morpheme base is inflected with a vowel-initial suffix as in (5a) the short nasal dominates a σ node. When the morpheme base is inflecting with a consonant-initial suffix the nasal is adjoining to the μ node that is headed by the segment /aa/. When the morpheme is surfacing in the stem-form the nasal is immediately adjoining to the ω node without any meditation.

This versatility is preferred to be handled by underspecifying the nasal in the input representation as in (5d) blow.

(5d) Input representation of /ta:n/

σ

μ μ

t a   n
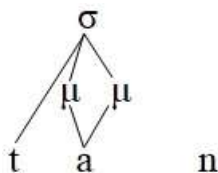
This theoretical manner in handling a 'segment's alternating prosodification' is referred to by Bermúdez-Otero (1999: 35) as 'structure-filling fashion'. His explanations are then followed with:

> In sum, short consonants in alternating environments will be lexically specified as non-moraic, as in McCarthy & Prince (1986, 1988) and Hayes (1989); cf. Hyman (1985). […] In the next section, we will see, however, that the representation of short consonants as underlyingly non-moraic creates non-trivial problems for the assessment of input-output faithfulness.
>
> (Bermúdez-Otero, 1999: 36)

176

The first critic for Bermúdez-Otero's words is the lack of preciseness. He repeatedly says 'alternating environments' whereas it is, as he states in (Bermúdez-Otero, 1999: 35), 'alternating prosodification'. Observingly as well, the expression 'non-alternating structure' is used to refer to the non-alternating prosodic associations of /t/ and /aa/ in the input representation of the hypothetical example. Therefore, the term *structure* for Bermúdez-Otero expresses partial associations in a representation not a whole representation of an input or an output.

The second critic is overgeneralization. Whereas Bermúdez-Otero's illustrations are focusing on the criticality of the short nasal due to its alternating prosodification, he overgeneralizes in his sum when stating 'short consonants in alternating environments will be lexically specified as non-moraic'. The expression 'short consonants in alternating environments' overgeneralizes what he really means, (i.e., 'segment's alternating prosodification [in environments]'). In general short consonants cannot always be non-moraic. This is because in the same chapter Bermúdez-Otero introduces the distinction between the heavy CVC and the light CVC. The final short C is weight-contributing in the heavy CVC and weightless in the light CVC. Since, mora is the prosodic unite that expresses weight count then in the heavy CVC the final short C is moraic whereas in light CVC the final short C is non-moraic. Observe that the hypothetical base morpheme which Bermúdez-Otero is giving is of the type CVVC. Hence, there are mainly two short consonants in the morpheme base; /t/ and /n/. The short consonant initial /t/ does not have alternating prosodification, thus, it is specified in the input representation as onset. The short /n/ displays alternating prosodification in the output representations of the different forms of the hypothetical morpheme. Because of preferring 'structure-filling fashion' the input representation does not link the nasal to any prosodic node. This absence of *segment-node association* is considered prosodic underspecification. However, Bermúdez-Otero introduces the absence of segment-node association as the absence of 'segment-mora association' and hence, introduces the nasal as being non-moraic. The overgeneralization can be seen clear if one considers a hypothetical morpheme base with three short consonants, such as $C_iVC_jC_h$. In this morpheme base two of the three short consonants do not have alternating prosodification. If this morpheme base belongs to a language that requires syllabic bimoraicity, then short C_j is *moraic*. Hence, it is not always that short consonants are non-moraic. In this language, the initial consonant C_i is specified as onset whereas the final alternating C_h is underspecified assuming the 'structure-filling fashion'.

On the other hand, underspecifying the alternating nasal in the input by specifying it as a 'non-moraic' consonant requires reasoning. As far as Bermúdez-Otero's hypothetical example, the three output representations do not show that the short nasal is ever heading a mora. This leads that there is no justification to assume that there is an absence for 'segment-mora association' in the input representation (see: Bermúdez-Otero, 1999: 37). Rather, the underspecification is that there is no segment-node association between the nasal and any node in the input representation. Yet, considering the output representations, it might be argued that a consonant with alternating prosodification is always weightless, (i.e., non-moraic). However, does that mean that if a language allows tri-moraic syllables it does not allow a consonant with alternating prosodification? I do not know the answer to this question and since Arabic is known to be a language that allows maximally syllabic bimoraicity I leave this here. However, I do think that in Arabic a consonant with an alternating prosodification is always weightless/non-moraic.

As for the theoretical manner which Bermúdez-Otero's prefers to handle the alternating prosodification of the short consonant, (i.e., 'structure-filling fashion'), I prefer over it another manner that has the advantage of expressing the specific alternating prosodification that are predicted. To explain, consider example (5), only three potentials await the nasal, these are, being linked to a σ node, μ node headed by /aa/ and ω node. If the input representation was supplied with this information the GENERATOR (GEN) is expected to generate more possible outputs or candidates. This means the amount of candidates which EVALUATOR (EVAL) is expected to choose from is less. Hence, I assume the following input representation for the hypothetical example.

(5e)
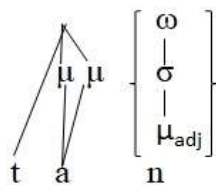
The curly brackets are to indicate the optionality of the specified nodes whereas the abbreviation adj in μ_{adj} means that the nasal is adjoined to a mora that is headed by other segment.

5.2.2.2 Recognizing a problem and suggesting a solution

It is not easy to understand the problem which Bermúdez-Otero is trying to draw the attention to. As far as Bermúdez-Otero (1999: 23):

178

[…], a hitherto unaddressed problem arises when a non-moraic input consonant is syllabified in the rhyme. In such cases, the output representation contains a segment-mora association which is absent from the input, and should accordingly be assessed as unfaithful by constraints such as DEP^μ and IDENT^μ. Yet there are conceptual and empirical grounds to suggest that DEP^μ and IDENT^μ cannot penalize such segment-mora links, which do not result in the neutralization of length contrasts.

Based on the above words, the 'problem' is that DEP^μ and IDENT^μ will assign unwanted penalties due to input-output moraic faithfulness. To resolve this problem Bermúdez-Otero (1999: 23) introduces 'positional μ-licensing' and rectifies DEP^μ and IDENT^μ:

I define a relationship of positional μ-licensing, which obtains between a mora μ and a segment α when α is non-moraic in the input representation and μ is the sole prosodic licenser of α in the output. The concept positional μ-licensing enables me to rectify the original formulation of DEP^μ and IDENT^μ, which are restated as conjunctive macro-constraints: e.g. in its conjunctive reformulation, DEP^μ is violated only by a mora which lacks an input correspondent *and* does not act as a positional licenser of some segment.

Bermúdez-Otero (1999) final equations for the positional μ-licensing and the two faithfulness constraints are presented below:

Positional μ-Licensing
A segment α is positionally μ-licensed by a mora μ_α if, and only if,
(i) α does not have an input correspondent linked to mora,
and   (ii) α is immediately dominated by μ_α and by μ_α only.
(Bermúdez-Otero, 1999: 48)

DEP^μ (final version)
Let μ be a mora in the output.
DEP^μ = (a)∧(b)
(a) μ has a correspondent in the input.
(b) μ is a positional μ-licenser.
IDENT^μ (final version)
Let α be a segment in the input.
Let β be a correspondent of α in the output.
Let α be linked to n morae.
IDENT^μ = (a)∧(b)
(a) β is linked to n morae.
(b) β is positionally μ-licensed.
(Bermúdez-Otero, 1999: 49)

He illustrates the solution as:

> DEP^μ and IDENT^μ are defined as macro-constraints (Crowhurst & Hewitt 1997) resulting from the local conjunction (Smolensky) of two micro-constraints (a) and (b). In both cases, (a) corresponds to the initial version of the homonymous constraint in Correspondence Theory, whilst (b) is a constraint requiring that a relationship of positional μ-licensing should obtain. According to Smolensky's definition of local conjunction, a candidate c violates the macro constraint (a) $\wedge$(b) if, and only if, c violates both micro-constraint (a) and micro-constraint (b).

(Bermúdez-Otero, 1999: 49-50)

Accordingly, what Bermúdez-Otero (1999) is modifying is the power which the initial two constraints have. The penalty from the revised DEP^μ and IDENT^μ requires dissatisfying the two micro-constraints '(a)∧(b)'. Hence, no penalty is given if only one of these micro-constraints was dissatisfied. The penalty would be assigned if and only if both micro-constraints were dissatisfied.

On the other hand, whereas this study adopts the solution that is offered by Bermúdez-Otero (1999) because it does not see any harm in this adoption, it reasons 'positional μ-licensing' in terms of how it is introduced and what it is. Observing Bermúdez-Otero's words revealed that he thinks of 'positional μ-licensing' as a 'phenomenon', 'term', 'concept' and 'expression' (see: Bermúdez-Otero, 1999: 37, 47, 23 & 37). Whereas I agree with him that 'positional μ-licensing' is a terminological expression that has specific concept but I do not think of it as a phenomenon. I think of it as a theoretical tool that is supposed to account for a phenomenon. This phenomenon is that there are weight-contributing codas and weightless codas which are explained in Hayes' model through the terminologies Weight By Position and Adjunction. I think by observing Bermúdez-Otero's writing that there is confusion between this phenomenon and the phenomenon that is under his focus, (i.e., 'the segment's alternating prosodification' (Bermúdez-Otero, 1999: 35)). To fit more with what I understood from Bermúdez-Otero's illustrations; the phenomenon that is under focus is *the short consonant's alternating prosodification*.

On the other hand, as far as I understood the problem is because of the manner that is selected to account for the alternating prosodification of a short consonant, (i.e., 'structure-filling fashion'). This theoretical manner means that the short consonant is underspecified in the input representation. Bermúdez-Otero thinks of this underspecification as the absence of mainly a 'segment-mora' association. This thinking raises a critic that has been explained above, and in my view, defeats the argued problem. However, the need for 'positional μ-licensing', 'positional licenser' and 'positionally μ-licensed' as theoretical tools that

introduce the rule-based terminologies Weight By Position and Adjunction into Stratal OT is still undefeated. The 'positional licenser' is the mora node to which the consonant α is linked to. If the Weight By Position is active then the short consonant α would be 'μ-licensed' by a mora that is headed by α. If Weight By Position is set 'off' then Adjunction would be operated and the short consonant α would be 'positionally μ-licensed' by a mora that is headed by other segment. These associations are meant to capture the weight count in a structure. Based on this, Bermúdez-Otero's (1999: 38) argument that 'positional μ-licensing' violates the original formulation of DEP$^\mu$ and IDENT$^\mu$ equaling in this vowel lengthening is an issue that requires more assessing that is left for future research.

5.2.2.3 Overall

Adopting Bermúdez-Otero's (1999) implementation of the moraic approach in OT is expected to offer convenient descriptive tools to account for generalizations that were formed in this study.

Nonetheless, what I add to Bermúdez-Otero (1999) is that I distinguish *terminologically* what he recognizes conceptually as two types of moraic preservation phenomenon. The first is a synchronic moraic preservation whereas the second is diachronic moraic preservation. In this study, the synchronic moraic preservation is referred to within the term moraic conservation whereas the diachronic preservation is referred to within the term moraic conservatism. The moraic conservatism preserves stranded morae which lead to 'moraic stability' of 'protoforms'. This type of mora count preservation is recognized by Bermúdez-Otero (1999, see particularly 171-172) in WGG. Bermúdez-Otero (1999: 171) observes that 'the mora count of Germanic protoforms was preserved' but concludes that this preservation 'is not particularly remarkable'. Whereas this was the case with the Germanic protoforms the evidence indicates that the preservation of mora count of Arabic protoforms is *exceptionally remarkable* in Arabic. The data that are collected for this study demonstrate that this type of mora count preservation exist in Arabic. The high lexical similarities that are immediately noticed between the old variations and the new variations of Arabic are taken as evidence that demonstrates the existences of the moraic conservatism phenomenon in Arabic. Because the lexical similarities are high it is concluded that the moraic conservatism is high and is efficiently processing stranded morae of lost moraic segments to achieve exceptional moraic stability. This exceptional moraic stability that is found in the data requires accounting for in the analysis through a moraic approach. The analysis, which is in section 5.6 in this chapter, is proposed based on implementing Bermúdez-Otero's (1999) moraic

approach on Stratal OT. Therefore, I give in the next section, (i.e., 5.3), more illustrations about the moraic conservatism phenomenon that holds the aim of explaining the significance of the existence of the moraic conservatism in Semitic languages.

Theoretically, the mora count preservation phenomenon is already recognized within Hayes's (1989: 285) "conservation law" which generalizes that compensatory lengthening 'processes conserve mora count'. This law has been reformulated by Bermúdez-Otero (1999:159) into optimality-theoretic terms: 'compensatory lengthening processes respect DEP$^\mu$'. In this study, it will be argued that in Arabic, it is not mainly the compensatory lengthening processes that results on conserving mora count. Rather, the processes vowel epenthesis, case-metathesis compensatory lengthening, and the substitution all target conserving the mora count in Arabic. In contrast, the processes deletion and root-metathesis, (i.e., the CVCC →CCVC shift) operate for non-preservation of mora count. It is argued that phonology in the Arabic language operates the processes that conserve the mora count to create systematized grammars that *continually* remain similar. The similarity in Arabic is not limited to lexical aspects but also include sematic aspects as can be seen from the appendixes and the different discussions in this chapter. Therefore, I argue that the semantic machinery in Arabic is incorporated in creating these continual similar grammars. However, in illustrating the significance of the phenomenon moraic conservatism I focus on the lexical similarity; hence, mainly on the role of phonology in creating these grammars. Yet, I allude, occasionally, upon specific aspects that are related to the semantic change machinery.

5.3 Moraic conservatism in Semitic languages

The lexical similarities that are observed by linguists can be categorized to the following: (i) lexical similarities between different word-forms in the same linguistic variety, (ii) lexical similarities between the dialectal variations of a language and (iii) lexical similarities that remain through centuries which are observed between the members of a language family. The third group of lexical similarities is what enables the historian linguists to group languages into language families. It is well-known that the lexical similarities in the Arabic language, (i.e., between its different variations and in different eras) and in the Semitic languages family, (e.g., Akkadian, Arabic, Aramaic and Hebrew) are distinctive. The focus next is on introducing lexical similarities in the Semitic family through a contrast between Arabic and Hebrew. The argument is that the exhibited lexical similarities between the sisters are due to the moraic conservatism phenomenon.

Even though the Semitic languages are different in the sense that is felt for the Indo-European languages but even a non-linguist can see that contrary to Indo-European languages

Semitic languages still display high rate of lexical similarity. I illustrate the nature of this lexical similarity through comparing Arabic data with data from Hebrew. The following Hebrew data were extracted from a course book that teaches Hebrew to Arabs, this is, Saʕad (1997). This book offers the words and sentences transcribed in Arabic transcript and Hebrew transcript. I transliterate the data using the IPA.

Hebrew	Arabic	Meaning
(6a) [ʔanii]	[ʔanaa]	1Pers.Sing
(6b) [ʔanaaħnuu]	[naħnu]	1Pers.Plur
(6c) [ʔattaa]	[ʔanta]	2Pers.Sing.Masc
(6d) [ʔaat]	[ʔanti]	2Pers.Sing.Fem
(6e) [ʔattim]	[ʔantum]	2Pers.Plur.Masc
(6f) [ʔattin]	[ʔantunna]	2Pers.Plur.Fem
(6g) [huw]	[huwa]	3Pers.Sing.Masc
(6h) [hij]	[hija]	3Pers.Sing.Fem
(6i) [him]	[hum]	3Pers.Plur.Masc
(6j) [hin]	[hunna]	3Pers.Plur.Fem

(Transliterated from Saʕad, 1997: 11)

Even though the dual pronouns are not provided by Saʕd (1997), which implies that they are lost in Hebrew, but the high similarity between the two pronominal sets is obvious. The loss of the dual pronouns is not significant as it is observed in most modern Arabic dialects. A significant, however, is that some of Hebrew realizations are known grammatical Arabic realizations, (e.g., [hin] and [huw][18]). My concern here is the amazing similarities that are observed between the pronominal realizations that belong to two different languages. Observe that the meaning of the pronominal sets is also the same; hence, there is also stability in the meaning of the pronouns. Since it requires a long span for two dialects of a language to become themselves two distinct languages the stability in the meaning of the pronouns that is being observed here increases the amaze. Because they are functional words, I assume that pronouns are processed by change in a language more than the other content words. However, the Hebrew and Arabic pronouns might be taking as evidence that falsifies my assumption. It should also be known that the observed similarity in the realizations and

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[18] Saʕd (1997: 11) transcribes the word in Arabic transcript as هُوَ. I transliterate وَ to the glide /w/. However, there is the possibility that he was intending the long monophthong /uu/. Yet, whether هُوَ is [huw] or [huu] the two realizations are grammatical in Arabic. On the other hand, Saʕd transcribe the words in Hebrew using the letters that he names الحرف اليدوي "the hand [writing] letter[s]". The symbols of these letters were not among the symbols list which my computer offers. However, I observed that there are other kind of letters offered in a list which Saʕd (1997:9-10) names الحرف المربع "the square letter[s]". The symbols of the square letters are offered on my computer, thus, I used another course book of Hebrew, (i.e., Kamaal, 1998: 11) to obtain the Hebrew transcription for the 3Pers.Sing.Masc pronoun which is הוא .

meanings between the two languages is not restricted to pronominal words; rather it can be seen also in nominal and verbal words. Verbal examples are presented in (7) and (8) whereas nominal examples are presented next in (9), (10), (11), (12) and (13):

	Hebrew	Arabic	meaning
(7a)	[ʔaxaal]	[ʔakal]	ate.Sing.Masc
(7b)	[savaaʕ]	[ʃabiʕ]	satisfied.Sing.Masc
(7c)	[pataaħ]	[fataħ]	opend.Sing.Masc

(Transliterated from saʕad, 1997: 12-13)

The similarity might be less obvious in the examples (7) because there are consonantal and vocalic substitutions, however, these substitutions do not ban recognizing the familiarity. The familiarity is because of the meaning of the verbs and that the substitutions are partial. Nonetheless, observing the conjugated-forms of the verbs increases the familiarity of the content part of the verb, (i.e., the base). Example (8), which shows the conjugated-forms of the verbs in (7a), eases recognizing the lexical similarity between the Hebrew and Arabic verbal conjugations. In addition, it shows how the realizations of the verbs of the two languages can be distinguished in the sense of *pattern* of word-formation not in the sense of different word[19]. The data that appears in (8) are transliterated from Kamaal (1998: 13)[20] which is another course book that teaches Hebrew.

	Hebrew	Arabic	meaning
(8a)	[ʔxal-tii]	[ʔakal-tu]	ate.1Pers.Sing
(8b)	[ʔxal-nuu]	[ʔakal-naa]	ate.1Pers.Plur
(8c)	[ʔxal-ta]	[ʔakal-ta]	ate.2Pers.Sing.Masc
(8d)	[ʔxal-ti]	[ʔakal-ti]	ate. 2Pers.Sing.Fem
(8e)	[ʔxal-tiim]	[ʔakal-tum]	ate.2Pers.Plur.Masc
(8f)	[ʔxal-tiin]	[ʔakal-tunna]	ate.2Pers.Plur.Fem
(8g)	[ʔaxaal]	[ʔakal]	ate.3Pers.Sing.Masc
(8h)	[ʔxl-aa]	[ʔakal-at]	ate.3Pers.Sing.Fem
(8i)	[ʔxl-uu]	[ʔakal-uu]	ate.3Pers.Plur.Masc
(8j)	[ʔxl-uu]	[ʔakal-na]	ate.3Pers.Plur.Fem

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[19] The sense of different word refers to how we perceive the English verb *ate* and the Arabic verb [ʔakal] which both has the meaning EAT.PAST. As for the sense of pattern of word-formation it can be understood from observing the Hebrew and Arabic conjugated-forms of the same verb, (i.e., EAT.PAST) above.

[20] Observe that Kamaal does not indicate in the Arabic transcription whether the glottal stop is followed with a vowel or not. In the transliteration, I assume that the glottal stop is not followed with a vowel and that a complex onset is surfaced initially in the Hebrew data. The exclusion for this is (3g) as transcribing the back vowel [a] that follows the glottal stop is following Saʕd's (1997: 12) transcription.

The following are the observations and the conclusions from contrasting the Hebrew data with the Arabic data:

i. The root of the verb EAT.Past in Hebrew consists of [ʔ], [x] and [l] consonants whereas in Arabic the consonants of the root are [ʔ], [k] and [l]. Hence, two of the three root consonants are the same. This means that through the long span only one root-consonant has been substituted.

ii. Only the phonetic value [a] and its counter in length [aa] are observed surfacing in the base of the realizations of both languages in (8a, 8b, 8c, 8d, 8e, 8f, 8g). The rest of the Arabic set, (i.e., 8h, 8i and 8j) surface [a] in the base. In contrast, the Hebrew realizations in (8h), (8i) and (8j) are observed surfacing a consonantal base that does not surface any vowel. Thus, the distinct between the two sets is in terms of surfacing a vowel or not, the quantity of a vowel and the position of surfacing a vowel. This manipulation affects the syllabic realization in a way that does not obstruct recognizing the similarity between the two languages.

iii. The suffixes 2Pers.Sing.Masc and 2Pers.Sing.Fem are the same as can be seen from the conjugated-forms in (8c) and (8d). This is a continual stability not only, lexically, structurally but also semantically.

iv. The two languages use the pronominal suffix [-uu] for 3Pers.Plur.Masc as can be seen from the conjugated-forms in (8i). However, in contrast to the Arabic conjugated-form, the Hebrew conjugated-form in (8j) surfaces [-uu] also for 3Pers.Plur.Fem. Thus, it appears that Hebrew lost the gender-distinction in the category 3Pers.Plur. Interestingly, many modern Arabic dialects do not display the gender-distinction in this category. This implies that the change in the Semitic languages is moving in the same direction. Hebrew lost the gender-distinction before Arabic but Arabic did not escape this loss as far as I can see. Since this observed directionality is consistent in terms of operating in a sister language I think that change in a language is just like the phonology of a language. I think both are manufactured machineries that co-operate to control the directions which a language is moving towards. Being controlled by manufactured machineries is not limited to the Semitic languages; rather, presumably other language families have their own manufactured machineries that control them.

v. The Hebrew pronominal suffixes [-tii], [-nuu], [-tiim] and [-tiin], which sequentially express 1Pers.Sing, 1Pers.Plur, 2Pers.Plur.Masc and 2Pers.Plur.Fem, surface the same consonants that Arabic pronominal suffixes surface in these categories. The

equivalent Arabic suffixes in these categories are [-tu], [-naa], [tum] and [tunna]. The conclusion that is deduced from this contrast between the lexical components of the Hebrew and Arabic suffixes confirms that the change is formed through manipulations with the vowels length and their surface-position. In addition, two new types of manipulations are observed in the aforementioned suffixes, these are, manipulating the qualities of the vowels and the length of consonants. This implies that change in languages is manufactured to make different kinds of manipulations. However, observe that all languages change but only the Semitic languages that exhibit high similarity despite change. Thus, I think that there are limits in manipulations which the change in a language is manufactured with. All world languages are controlled with the limit of manipulation which their change machineries are manufactured with. Hence, none of the world languages exceed the specific limit of manipulations that their change machineries allowed with. These assumptions have rationales that justify them, these include, the high similarity which the languages of the Semitic family exhibit in contrast to the languages of the other families, (e.g., Germanic). In addition, the recognition that there are similarities between world languages that inform the type of relationships between them in the form of motherhood and sisterhood. Moreover, the awareness that there are specific distinctions between the mother languages and their daughters from one side and between the sister languages from the other side. Nonetheless, the similarity that distinguishes Semitic languages is presumably because the change in the Semitic languages is manufactured not to exceed very specific and very limited manipulations. Other world languages, presumably, possess change machineries that are manufactured to permit bigger amount and more various types of manipulations though these amounts and types are also limited and specific[21].

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[21] Scientifically we know that the world contains of many created substances. Within different fields of sciences we study these created substances to improve not only our own knowledge of the world we live in but also to improve humanities' life in this world. The discoveries of scholars in the different fields show that the substances that surround us are unique in terms of its creation. Part of their uniqueness is that they are complex, fixed and beautiful. We know that they are complex and fixed because the scholars demonstrated that specific quantities of *things* are what form these substances. Think of the air that we breathe; we know that it is a mixture of gases that are compounded. The gas is a thing that itself is created of things, (e.g., electrons) that are also compounded. The compounding of the things that form the air and those that form the gas is known to be fixed in terms of the How and the Amount among other things. A language that we speak is itself a mixture of words that are compounded in a fixed way. The words themselves are things that are formed by compounding smaller things, (i.e., sounds). As far as the discoveries of the linguists, we know today that each language we speak is also fixed in terms of the How and the Amount of the things. I grew up learning that THE GOD ﷻ is THE CREATOR who created everything fixed in terms of the How and the Amount. I learned that I should be observant to everything in the world because everything displays the greatness and the majesty of THE GOD ﷻ.

vi. The suffix [-aa], which expresses 3Pers.Sing.Fem in the Hebrew *verbal* conjugated-from in (8h) is interesting. This is because the suffix [-aa] in Arabic expresses Sing.Fem in *nominal* words, (e.g., [ðikr-aa] "reminder.Sing.Fem" and [ħubl-aa] "pregnant.Sing.Fem"). Observe that there is no substantiation here that leads us to conclude whether the mother language of Hebrew and Arabic has the suffix [-aa] inflected with verbal or nominal words. Yet, that the two decedent languages are exhibiting one suffix that has the same function sustains that this suffix is inherited from the mother language. Also, observes that the two languages generally have preserved the suffixes of their mother language as can be seen from the similarity between their suffixes in the whole data. Because of this high similarity, which the suffixes of the two languages show in their set of data, I argue that both languages preserve the mora count of the proto-Semitic language for a long span. The Hebrew suffixes in (8b), (8c), (8d), (8h) and (8i) have the same moraic weight of the Arabic suffixes in these examples. Accordingly, another feature that distinguishes the change in the Semitic languages is that the manipulations are not mainly very limited and very specific but they also have a basic target. This target is preserving the moraic weight through processing a stranded mora of a moraic lost segment to conserve it. This moraic conservatism, which results on high moraic stability, is to preserve the similarity between the mother and the sisters through long spans.

The examples in (9), (10), (11), (12) and (13) show that the similarity between the two languages is also found in the nominal words.

Hebrew	Arabic	meaning
(9a) [piil]	[fiil]	elephant
(9b) [pii]	[fam]	mouth
(10a) [ʔaaħ]	[ʔax-V]	brother
(10b) [ʔaħuut]	[ʔuxt-V]	sister
(10c) [ħamiiʃii]	[xamiis-V]	Thursday

The illustrations that are offered here for the phonology and the change as two fixed manufactured machineries that work based on quantities stem from Islamic beliefs about THE GOD ﷻ and the creatures. Muslim scholars believe that the created substances are creatures made by THE GOD ﷻ. THE GOD ﷻ in the Qur'an informs specific facts about the creation and creatures. For instance, that the amount of the water in the earth is limited in terms of its amount is understood from verse (18) in Chapter (23) ʔal-Muʔminuun. In verse (49) in Chapter (54) ʔal-Qamar, THE GOD ﷻ literary informs that HE created everything in/with specific amount/quantity. The scientific discoveries in general about things are conveyed verbally by Muslim scholars in a way to clarify the greatness and the majesty of THE GOD ﷻ so that people know, realize and believe. They also aim to increase the awareness that the Qur'an is the real unchanged message to humans from THE GOD ﷻ who created them and created the world they live in. The increase of the awareness is hoped to increase those believers who follow the correct teachings, (i.e., the teachings of Islam).

(11a) [ʃanaa]	[sanat-V]	a year
(11b) [ʃivʕ-iim]	[sabʕ-uun]	seventy
(11c) [haaʃmiiʕaa]	[ʔas-samʕ-V]	the hear
(11d) [ʃaaʕaa]	[saaʕat-V]	an hour
(11e) [ʃabbaat]	[sabt-V]	Saturday
(11f) [ruuʃ]	[raʔs-V]	head
(12a) [ʃluuʃaa]	[θalaaθat-V]	three
(12b) [ʃnijjaa]	[θaanijat-V]	a second
(13a) [ʕasraa]	[ʕaʃrat-V]	ten
(13b) [ʕisriim]	[ʕiʃruun]/[ʕiʃriin]	twenty
(13c) [siiʕaar]	[ʃaʕar-V]	hair

(Saʕd, 1997: 27, 28, 29, 36, 37, 41, 44, 112)

The data that are offered here are few of many. As an observer I can see specific and some are consistent consonantal substitutions that ease recognizing the relationship between the nouns. For instance, In the Arabic realizations that surface voiceless alveolar fricative [s] the Hebrew realizations surface voiceless post-alveolar fricative [ʃ], (see the examples in 11). In Arabic realizations that surface voiceless velar fricative [x] the Hebrew realizations surface the voiceless pharyngeal fricative [ħ] (see the examples in 10). In the Arabic realizations that surface voiceless labio-dental fricative [f] the Hebrew realizations surface voiceless bilabial stop [p] (see the examples in 9). The examples in (12) show that the Arabic realizations surface voiceless dental fricative [θ] instead of the Hebrew [ʃ] whereas the examples in (13) show that instead of post-alveolar [ʃ] Hebrew surfaces the alveolar [s]. Observe that that the meanings of the nouns are stable which make recognizing the connections between the nouns of the two languages easy.

There is an observation about the Arabic and Hebrew realizations that appear in (11f) which have the meaning "head". The Arabic stem that means "head" is among the investigated stems in this study. Thus, in addition to the above CA, SA and MSA realization [raʔs-V], which appears in (11f), Arabic dialectal realization is collected for "head". Only one dialectal realization was obtained for the stem-form of this word from the four investigated modern Arabic dialects, (i.e., [raas]). Contrasting the Hebrew realization in (11f) with this Arabic dialectal realization, shows interesting resemblance. Just like the modern Arabic dialects, Hebrew surfaces a long vowel instead of the glottal stop. When forming conclusions in chapter four, it was concluded that surfacing the glottal stop is older than surfacing the long monophthong vowel. This conclusion was formed because of what has been found in CA of the seventh century about the phonemic state of the glottal stop. The findings in the

Arabic language indicate that it is most probable that the Hebrew realization is younger than the CA, SA and MSA realization [raʔs-V]. Nonetheless, whereas the modern Arabic dialectal realization shows that the surfaced long vowel is the open back tense [aa] the Hebrew realization in (11f) shows that the surfaced long vowel is the close back round tense [uu]. If it was proven that consistently Hebrew surfaces [uu] instead [ʔ] of the Arabic realizations then we are encountering interesting phenomenon of language change. This phenomenon is that phonology repeats the same pattern of change to create new grammars. Since the Hebrew realization is older than the modern Arabic dialectal realization then what the Semitic Arabic phonology has done was copying the procedures that led to form the Hebrew realization.

Another observation is about the examples in (9b), Saʕd (1997) provides the noun [fam] as a translation for the Hebrew [pii]. This translation is correct in terms of the meaning as both nouns indeed mean "mouth". However, phonologically and semantically I think a better Arabic translation is [fii] as this noun also means "mouth". In addition, it shows that the two languages have similar structure for the noun that differs mainly in the root-consonant. On the other hand, in relation to the Hebrew realization [pii], there is the possibility that Saʕd (1997) was intending the palatal glide [j] not the front [ii]. In this case the Hebrew realization would be [pij]. The similarity with the Arabic realization would still be recognized as in Arabic the glide [j] surfaces in some inflected-forms of [fii], (e.g., [fijj-ii] "moth.1Pers.Sing").

Moreover, it was observed that Saʕad (1997) does not indicate in the Arabic translation that, due to case, Arabic nouns have more than 1 realization. The diacritics in Arabic orthography are the general symbols that are used to transcribed case. However, case is transcribed through other symbols, (i.e., letters) in dual and two types of plural nouns, as has been informed in chapter two. Because of this, the dual and the two types of plurals have more than one transcript. Each transcript expresses one case realization. Saʕad (1997) was found providing only the nominative transcript of the Arabic plural noun in (11b). In general, his act, linguistically, was thought to be inappropriate because it does not provide the full components of Arabic nouns that might enhance our understanding of the connections between the nouns of the two languages. The connection between the Hebrew realization [ʃivʕ-iim] and the Arabic *nominative* realization [sabʕ-uun] is not as straightforward as the connection between the Hebrew realization and the Arabic *genitive* realization [sabʕ-iin]. In addition, connecting the Hebrew [ʃivʕ-iim] with the Arabic genitive [sabʕ-iin] is more informative than connecting it with the Arabic nominative [sabʕ-uun]. Whereas the nominative [sabʕ-uun] only shows that the nasal in the plural suffix has been changed to

another nasal consonant, the genitive [sabʕ-iin] shows that long front vowel in the plural suffix most probably is inherited from the mother language of the two languages.

Finally, the geminate in the Hebrew realization [ʃabbaat] in (11e) is interesting as its absence in the Arabic realization [sabt-V] indicates that of the two Semitic languages, it is Hebrew that has inherited the tendency to generate geminate structures. This conclusion is formed in accordance to the findings about the geminate in the modern Arabic data that were explained in chapter four. A main conclusion that was formed is that ECA and kħA in contrast to IBA seem to have to a grammar type that generates geminate.

On the other hand, observing the data that Saʕd (1997) offers made me discover that there is morphological substitution that can be also considered as another type of manipulation. I noticed that Hebrew expresses specific meanings through realizations that can be connected to nominal Arabic words that have related but different meanings than the one that Saʕd (1997) specifies. Consider the following examples in (14).

Hebrew	Arabic	meaning
(14a) [ʃaaluum]	[marħabaa]	"Hello"
(14b) [haa-rʔijjaa]	[ʔan-ðˤarˤ-V]	"sense of sight"
(14c) [buukir]	[sˤabaaħ-V]	"morning"

(Saʕd, 1997: 22, 27, 36)

The Hebrew realization in (14a) has a similar Arabic realization that does not have the precise meaning of the word [marħabaa] which Saʕd (1997) gives as a translation. This other Arabic realization is the word [salaam-V] which means "peace". The realization [salaam-V] is, just like [marħabaa], a wide-used greeting word in Arabic. In contrast to [marħabaa], however, [salaam-V] is a religious greeting word which is a praying that conveys a pleading to THE GOD ﷻ to give the addressee(s) peace. The Hebrew [ʃaaluum] and the Arabic [salaam-V] are highly similar, thus, if Saʕd (1997) was providing the correct meaning for [ʃaaluum], (i.e., [marħabaa] which in English means "Hello") then, considering the exhibited similarities and the word-usage, it is most probable that the Hebrew meaning is due to a semantic development. Considering that historically Islam is younger than Judaism, I think that establishing the Arabic [salaam-V] as a greeting word is younger than the Hebrew [ʃaaluum]. Thus, it might be that the long practice for [ʃaaluum] that shifted the greeting from being a pleading meaning to THE GOD ﷻ to be a pure greeting word.

As for the realizations in (14b), Saʕd (1997) is not giving the correct Arabic word that is commonly used for the "sense of sight". For the sense of sight the Arabic noun [ʔal-basˤar] is more common. However, the Hebrew [haa-rʔijjaa] appears to be closely connected to the

190

Arabic noun [ʔar-ruʔjaa] which means "vision/sight". The significance differences, which the Hebrew realization displays from [ʔar-ruʔjaa], are (i) the gemination of the root-consonant [j], (ii) different root-vowel, (iii) different definite prefix and lastly (iii) more complex syllabic structure.

Finally, in (14c) the meaning "morning", which is expressed in Hebrew through [buukir] whereas in Arabic it is expressed through [sˤabaaħ-V], might be a semantic development for the noun of one of the two languages. This conclusion is because Arabic has realizations that are similar to the Hebrew [buukir]. These realizations are [bukrat-V] and [baakir-V] which among other realizations belong to a specific word-family. This word-family expresses different meanings that are in general can be classified under this main meaning: "the early of a thing". The Arabic realizations [bukrat-V] and [baakir-V] have a specific meaning, (i.e., "the early in the morning=dawn"). As for the Arabic realization [sˤabaaħ-V], which Saʕd is providing as a translation for the Hebrew [buukir], is a synonym for the Arabic [bukrat-V] and [baakir-V]. Hence, [sˤabaaħ-V] also means "the early in the morning=dawn". However, semantically the three Arabic realizations today do not hold the meaning "the early in the morning=dawn" except in CA, SA and MSA. In these varieties [sˤabaaħ-V], [bukrat-V] and [baakir-V] are to some extent synonyms that all share the meaning "the dawn" or "the early of the morning". In the modern Arabic vernaculars, as far as I know, these three realizations are not synonyms anymore. For instance, the realization [baakir] in KħA surfaces as [baatʃir] whereas [bukrat-V] surfaces in ECA as [bukra] and both mean "tomorrow". In contrast, The Arabic realization [sˤabaaħ-V] and [sˤubħ-V] in KħA do not hold the meaning "the early of the morning" which specifies of day-time periods the dawn period. Rather, commonly the KħA realizations, (i.e., [sˤabaaħ] and [sˤubħ), in terms of the time period that they specify, locate the period that is after the sunrise until before the noon. Clearly, the dialectal Arabic realizations display phonological change and their meaning display semantic change. Considering the contrast between the realizations and the meanings of the classical era and the dialectal of the modern era, both the phonological and semantic changes are concluded to be slow. Based on this I argue that in Arabic in particular and in Semitic languages in general the phonological and semantic changes are manufactured to be very slow in contrast to the other world languages.

The focus in this study is on mainly the phonological change in mainly the Semitic Arabic language, though the uniqueness which this language display is assumed to exist in the other sister Semitic languages. However, I leave investigating the Semitic languages for future research.

The collected data manifest that Arabic phonology has change machinery that operates to preserve mora count within long time spans. Therefore, the distinction between phonological processes that are implemented by Arabic phonology should be recognized through their role in the moraic stability as this is the clear evident characteristic of this language. According to this characteristic, the analysis that is developed in 5.6 assumes essentially that the stranded mora of the lost vocalic maker is still preserved in different levels of the modern Arabic grammars through operating moraic stability processes, (e.g., vowel insertion). In other words, the central debate in the analysis is that the mora of the vocalic case marker has undergone moraic conservatism. The analysis also has the argument that modern Arabic dialects display variation in manifesting this moraic conservatism in terms of its degree, percentage and the process(s) that is operated to save the stranded mora. Clearly, IBA has the highest degree of this moraic conservatism.

5.4 The theoretical approaching for CVCC syllable of Arabic

There are different theoretical accounts in the literature of Western phonology for the CVCC syllable in the Arabic language. For example, in metrical theory and autosegmental theory there is McCarthy (1979/1985). In Stratal OT, there is Kiparsky (2000 & 2003) and Watson (2007). In Harmonic Serialism, there is McCarthy (2011). In this section, I shed some lights on these accounts to demonstrate that a moraic approach that recognizes the segments that contribute to the syllable weight has a privilege in distinguishing the noticed characteristics of this syllable type in Arabic synchronically and diachronically. Moreover, applying the moraic approach allows sighting how Arabic phonology manipulates the position of mora to reduce the effects of the loss of the vocalic markers to keep initiating similarities between the grammars of the varieties of Arabic.

Therefore, in addition to the main argument that was stated within the tested thesis of this study, (i.e., the vowel epenthesis targets avoiding the novelty of CVCC syllable), I argue that the vowel epenthesis also targets the moraic stability of the stranded mora of the lost vocalic case markers.

As will be seen in the brief review that is presented in 5.4.1, mora as a theoretical prosodic unit has been considered in accounting for the CVCC of Arabic in some literatures, (e.g., McCarthy & Prince 1990; Broselow 1992; Kiparsky 2003 and Watson 2007). However, there are theoretical studies that do not implement the moraic role in their account for the CVCC of Arabic, (e.g., McCarthy 1979/1985 and McCarthy 2011). Thus, the discussion in this section is also developed towards demonstrating that Stratal version of OT that implements moraic approach would be sufficient as a framework to account for this syllable

192

type. The headings that organize the discussion in this section are three, (i.e., a moraic approach, a non-moraic approach and Stratal OT).

5.4.1 A moraic approach

The discussion under this heading intends to show that approaching CVCC syllable of Arabic by considering the moraic weight is not new as there are several works that have adopted the moraic theoretic tool to express generalizations instead of mainly expressing the generalizations with other theoretical conventions, (e.g., McCarthy & Prince 1990; Broselow 1992; Kiparsky 2003 and Watson 2007). In brief a review of these works is offered next. McCarthy and Prince (1990: 11) argue of 'the central importance of the notion mora in Arabic'. In their work, there are several establishments that have been declared about the phonology of Arabic guided by the so-called 'Prosodic Morphology Hypothesis'. This hypothesis is supposed to capture the Arabic morphology as a 'templatic morphology' with a 'property of shape-invariance' utilizing what they described as 'the authentic units of prosody: the mora, the syllable, the foot and the phonological word' (McCarthy and Prince 1990: 3). In their paper, the phonological establishments included different types of stems, but I am here mainly focusing on what is related to this study, (i.e., the characterization for the moraicity and extrametricality in CVCC noun stems in Arabic). Based on their findings, The CVCC noun is a bimoraic stem that ends with an extrametrical consonant. They recognize the final-C in CVCC stem as an extrametrical non-moraic consonant because it is syllabified as onset when the stem is inflected with vowel-initial suffixes. Therefore, the final-C is recognized as incomplete syllable at the periphery of a stem. McCarthy and Prince (1990) introduce the Contiguity Constraint to capture their establishments.

> Contiguity Constraint
> Syllabic well-formedness is enforced over contiguous strings of
> subsyllabic elements.
> (McCarthy & Prince 1990: 15)

According to this constraint, which they argue to be universal, the final-C in the CVCC noun stems is identified as an incomplete vowel-less syllable σ. This is expressed in the following representation which appears in McCarthy and Prince (1990: 14):

(15)

bah   r   "sea"
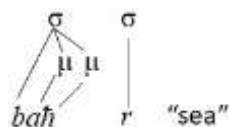
Such representation for the CVCC noun stems in which the rhotic in the previous example is treated as an incomplete syllable, (i.e., a non-moraic onset), has the convenient of assigning the vocalic case suffix the mission of filling the rhyme position. In that, when the stem is suffixed the short vocalic marker would be attached to the right edge of the stem surfacing as the nucleus of the final-C. Hence, the surfaced contextual form *baħrV* of the stem *baħr* shows that /r/ is syllabified as an onset for a complete syllable. Bearing in mind that McCarthy & Prince (1990:1) are essentially approaching SA data abstracted from case and agreement affixes in their theoretical work then their data consist of mainly what surfaces as a pausal form in Arabic.

Broselow (1992) presents another theoretical treatment that employs the mora to characterize the variation in syllabification patterns in some modern Arabic dialects, (i.e., Cairene Arabic, Iraqi Arabic, Sudanese Arabic and Makkan Arabic). A main characteristic about these dialects is that all of them 'constrain syllable structure to prohibit both complex onsets and complex codas within phrases' Broselow (1992: 11). She argues that all the dialects obey the following Bimoraicity Constraint.

Bimoraicity Constraint
Syllables are maximally and optimally bimoraic.
Broselow (1992: 10).

However, Broselow (1992) makes a distinction between CVCC and CVVC when accounting for them. After displaying data from the aforementioned dialects, she concludes that:

we find a hierarchy of possible syllable types, with CV, CVV, and CVC universally permitted; CVVC permitted stem-finally in all dialects and medially in some; and CVCC permitted stem-finally in some dialects but medially in none' (Broselow,1992: 13). To capture the differences between the syllables CVVC and CVCC in the modern dialects or what she referred to as '*The Problem of the Third Mora*'
(Broselow, 1992: 11, the italic is in the origin)

Broselow (1992: 14) introduces what she terms as 'The adjunction option'. She also was found concluding that 'CVVC sequences that arise in the dialects are in fact bimoraic deriving from an adjunction rule that creates moras dominating two segments'. Following this she was found stating that:

The restriction of adjunction to Mora to VVC sequence means that in those dialects that do permit surface CVCC syllable, the post-Adjunction structures of surface CVVC and CVCC must be distinct. The prohibition of both biconsonantal moras and trimoraic syllables will prevent the final consonant in CVCC sequence

from being incorporated into the preceding syllable, with the effect that following the level at which Adjunction applies, VVC is bimoraic while VCC remains trimoraic'.

<center>(Broselow, 1992: 16)</center>

What Broselow means by '*the Third Mora*' and 'remains trimoraic' is unknown for me and it appears contradicting the Bimoraicity constraint which she formulates arguing that the Arabic dialects obey. Nonetheless, a main significant finding regarding Broselow (1992) is that she recognizes levels, in which the phonological processes, (i.e., vowel epenthesis and vowel shortening), occur to incorporate the extrametrical final consonant. However, I claim that her conclusions do not manifest exactly what happens in each level leading to a distorted picture. This is because she theorizes approaching both nominal and verbal stems without displaying caution for possible asymmetries between nominal words and verbal words, which as demonstrated in chapter four, do exist in Arabic. The following is another substantiation that affirms that caution should be applied in Arabic for symmetries and asymmetries between nouns and verbs.

Systematically, the potential for the vowel epenthesis to occur in nominal words is greater than verbal words. This is because in Arabic there are CVCC nominal roots but there are not verbal CVCC roots. The exclusion for this is CVC_iC_i as both the verbal and nominal words have this type of root according to the establishments of ALT. However, the collected nominal data show that final $-C_iC_i$ is different from final $-C_iC_j$ in terms of how this cluster is resolved in the stem-form. The final geminate was resolved in all the four modern dialects through deleting the final consonant. In contrast, the resolution of final $-C_iC_j$ was through different processes; the most common one is the vowel epenthesis. This implies that the resolution of final $-C_iC_i$ in verbal words will not include vowel insertion. I can confirm this for KħA CVC_iC_i verbs since it is my native dialect. In KħA the final geminate of CVC_iC_i verbs is resolved through deletion as can be seen from (16). Hence, it is there is a good possibility that the epenthesis may occur in a stem-level of mainly nominal words but *not* in verbal words in Arabic.

(16a) /ʒarr/→ [ʒar] "drag.Past.Sing.Masc"
(16b) /ʃadd/→[ʃad] "tug.Past.Sing.Masc"
(16c) /tamm/→[tam] "finish.Past.Sing.Masc"

Therefore, I argue that the domain of a level for suggesting an analysis within Stratal OT needs to be conceptualized within a *clear definition* that recognizes the nominal-verbal asymmetries in Arabic. The absence of this recognition for the nominal-verbal asymmetries

in Kiparsky (2003) and Watson's (2007) data, who are employing Stratal OT, is a significant weakness for their analysis even though it accounts for several generalizations acknowledged about the modern Arabic dialects. Both Kiparsky (2003) and Watson (2007) approach their data with a consideration for moraic weight. In essence, Watson (2007) is an extended analysis of Kiparsky's (2003) 'semisyllables' approach which accounts for floating consonants. Hence, it is another theoretical account for extrasyllabic consonants.

Therefore, in some perspectives, the above review studies support this study in approaching Arabic data through a moraic approach that recognizes levels. The studies also affirm the Extrametricality of final-C in CVCC and, disregarding the contradictory that appears in Broselow's (1992), the Bimoraicity constraint in Arabic is assumed in this study.

5.4.2 A non-moraic approach

Under this heading, a brief review for Hamid's (1984) analyses for CVCC and two different theoretical works of McCarthy (1979/1985 & 2011) are provided. The weakness of all these theoretical treatments to account for syllable types including the CVCC is the argument.

Starting with McCarthy (1979/1985: 25), McCarthy recognizes the CV, CVV and CVC as the 'three canonical syllable patterns' in Arabic. He also recognizes that:

> There is, in Classical Arabic, a particular syllable type that is limited almost exclusively to the position at the end of a phonological phrase, the superheavy syllable CVVC and CVCC. This syllable results from the loss of final short vowels before a major pause, […]. The superheavy syllables of Arabic, although more complex than the other types, are, however, clearly single syllables by any measure of surface syllabification.
>
> (McCarthy, 1979/1985:26) [22]

From this quotation, it is obvious that McCarthy recognizes that surfacing the two syllables CVCC and CVVC is due to the deletion of the vocalic markers to form pausal forms. Moreover, from this it can be noted that he treats, theoretically, both syllables CVVC and CVCC as **one type**, (i.e. 'superheavy syllable')[23]. The proposed representation for these two syllables is supposed to be as following (McCarthy, 1979/1985: 27):

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[22] McCarthy does not defines the term Classical Arabic in this work, but based on the data that appears in his work, the term seems to refer to the standard forms of the classical era, which is normally acknowledged in WL as Standard Arabic.

[23] Broselow (1992: 8) acknowledges that it is McCarthy who have called the syllables CVCC and CVVC 'superheavy' recognizing them as a third syllable type beside the heavy (CVC or CVV) and the light (CV) in Arabic. However, contrary to McCarthy's theoretical analysis, Broselow (1992) analytically does not treat CVCC and CVVC as a 'single' type.

(17)

```
                σ
            s  /   \  w
          σ        |
        /   \       |
       w     s      |
       |    / \     |
       |   s   w    |
       C   V  [V]   C
              [C]
```
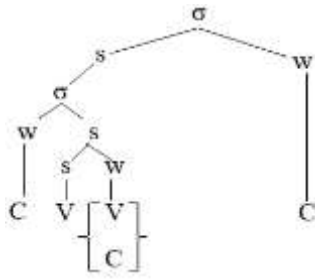
The representation that appears in (17) is supposed, according to McCarthy (1979/1985), to recognize the internal constituents of the superheavy syllable type within the notion that the σ node dominates a full binary-branching tree. The labeling of the dominated nodes is supposed to represent a relative strength relationship. Based on his representation, McCarthy recognizes the syllabification of the final consonant as 'Chomsky-adjoined to a preceding syllable' McCarthy (1979/1985: 27). McCarthy (1979/1985: 28), based on this suggested representation, views 'A superheavy syllable, then has a Janus-like character: it presents itself to surface representation and phenomena like meter as a single syllable'. Thus, this single superheavy type of syllable, according to McCarthy (1979/1985: 28), constitutes two rhymes that differ in terms of branching. In that, the branching rhyme is located under the subordinate node σ whereas the nonbranching rhyme is dominated by the mother node σ. Utilizing this theoretical treatment, which he described as 'geometric treatment of syllable weight', McCarthy (1979/1985: 82) argued that it is superior to the notion mora in Prague school structuralism which has, according to him, two major theoretical defects.

The first is that it 'makes the extremely weak claim that the potential number of syllable weight distinctions in any language is bounded only by the cardinality of the integers' McCarthy (1979/1985: 82). The second is that 'its essentially diacritic nature -- nonuniversal rules map syllables onto particular moraic configurations' McCarthy (1979/1985: 82). However, this work is an early work of McCarthy's as it is his dissertation for the PhD. Thus, since a different view for the role of mora as a theoretical measurement tool appears in McCarthy and Prince (1990), the theoretical analysis that is developed in this study considers the later work of McCarthy a support for the superiority of approaching the syllable types in Arabic through a moraic approach. Moreover, I follow Broselow (1992) in treating theoretically the two syllables CVCC and CVVC as two *different* types not a single type though I recognize each as superheavy.

In his more recent work, McCarthy (2011), a paper that was reviewed in chapter two in this study, he was found proposing an analysis for several types of pausal forms in

Classical Arabic. One of his patterns is the pausal forms of the monosyllabic nominal CVCC stems. The special about these pausal forms is that there are case-metathesis processes, (i.e., NOM-metathesis and GEN-metathesis) which operate to break up the final consonantal cluster. Contrary, the accusative pausal forms of this type of nominal stems surface the consonantal cluster as the accusative marker undergoes deletion not metathesis. When being traced, it was found that this pattern occurred in the 8th century as one variation among others for such type of nouns, whereas the collected 7th century data did not provide evidence for the existence of this pattern. This pattern is of interest for this study because it shows that among the repair strategies that were employed by phonology to avoid the CVCC is case-metathesis. However, I argue that McCarthy's (2011) proposed analysis for this type of pattern has two theoretical defects.

Firstly, the role of moraicity is not accounted for in McCarthy's analysis as one can see from the constraint hierarchy that is proposed in McCarthy's (2011). Accordingly, even though his analysis recognizes the role of metathesis in avoiding the complex coda as the constraint *COMPLEXCODA is imposed to ensure this, but his analysis lacks the recognition of the Bimoraicity Constraint in the Arabic language which is already claimed to be a prosodic requirement in Broselow (1992) following (McCarthy & Prince 1990).

Secondly, in what seems to be an attempt to overcome a defect in the theoretical framework that he is using, (i.e., Harmonic Serialism), McCarthy's (2011) analysis treats the metathesis as infixation. The idea of suggesting the infixation as an alternative makes the **wrong** assumption that 'the nominative suffix [-u] is not *moved* into the preceding cluster; rather, the morphosyntactic feature Nom is *realized* in that position' (McCarthy; 2011: 10, the italic is in the original). It is a core issue for the argument of this study to recognize the case-metathesis process in the analysis as it really is, (i.e., a process of segmental reorganization). The reordering of two vocalic case markers to avoid the syllabic innovation needs to be recognized in the analysis to capture what the collected data inform in relation to the change resulting from the loss of the markers.

Moving to Hamid (1984), he was found presenting two theoretical accounts for the CVCC in his SCA data. The first account was based on the standard generative theory that was presented by Chomsky and Halle 1968. The idea of this theory, as concluded from Hamid's application, is forming generalizations that are described through liner rules. The application of the liner rules seemed sufficient to account for Hamid's generalizations. The second theory was the theory of nonconcatenative morphology which was proposed by McCarthy (1981). In this theory, the account for the SCA data appears more complex as the

representation of vowels and consonants appear in different tiers. However, Hamid was not found critically evaluating the theory. Therefore, after consulting McCarthy's (1981) work, it is found that this work is unreliable because it confuses between the establishments of two distinct fields among other things. For instance, البنى الصرفية "the morphological structures", which are established by the early grammarians of ALT, were referred to 'by the Hebrew term *binyāníim* (singular *binyá*)' in McCarthy (1981: 377) without justification. The Arabic roots of verbs were introduced as mainly consonantal (see McCarthy, 1981: 384 in which he introduces the root of the "write" as '*ktb*'). The falsification of this assumption about the Arabic root is explained in chapter six, thus I will not pursue it here. Finally, several mistakes noticed in the transcriptions and the translations. Nonetheless, McCarthy's proposed theoretical account is understood as following, an Arabic verb is accounted for through three tools. These are the 'prosodic template', 'vowel melodies' and 'consonant melodies' that get associated.

5.4.3 Stratal OT

The impression that I had from surveying the phonological theoretical market[24] is that the recognition of the weaknesses of classical OT has led to a theoretical expansion in which attempts to resolve the defects in the theory have been made. In this part of this section, I am not in the position of evaluating the theoretical attempts in terms of their privileges or weaknesses for the progression in the theoretical studies. Rather, the target here is restricted to explaining the advantage of adopting the Stratal OT framework which the suggested analysis in 5.6 is based on. This advantage is centered on the notion of level segregation which enables to show that there are different grammatical outputs/candidates. Because of the level segregation, the grammar is seen within levels that each is viewed as a cyclic domain (see Bermúdez-Otero 1999 and Kiparsky 2000; 2003). This level segregation is an advantage that entails accounting for the phenomena that induced due to morphology-phonology interface and morphosyntactic-phonology interface. Because of this characteristic in stratal OT the analysis to account for the phonological structures of Arabic nominal words is more straightforward and convenient as will be seen. The support for the need for level segregation to account for Arabic data come from the already notes that were made by phonologists even

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[24] Generally, I view the different theories that are established as *goods* that are consumed to shape the created substances in the world we live. These goods are offered for sale and the establishers of the theories are sellers. The buyers who consume these goods are scholars/researchers who select the good that they think it is appropriate to shape the substances that are between their hands. Thus, the expression 'the phonological theoretical market' literary means: the different phonological theories that are offered for sell.

in pre-OT works, (e.g., Broselow 1992 who assumes different level of presentation for Arabic data).

On the other hand, this study has a main target which is introducing a new theoretical notion. This new descriptive tool is named *confines* and it is established to describe the determiners that border the levels/strata in Arabic for monosyllabic nominal words in which the analysis will be based upon. In other words, I suggest in explicit words what should be considered *the domain of each level/stratum* of Arabic monosyllabic nominal words. The confines are suggested based on my understanding for the realization of monosyllabic nominal stems which is gained from examining thoroughly the data of this study, my own intuition as a native Arabic speaker, my experience as an ALT grammarian and my knowledge in WL. Even though I specify these confines for the monosyllabic words but I think that with some revisions the confines might be redefined to include other types of nominal Arabic words. Even though I establish the confines theoretically for Arabic but I think that the levels of other world languages have also confines that can be established by those who are experts in them. Hence, bordering the domain of each level/stratum of the languages through defining/determining the confines is a task that awaits ambitious linguists. In other words, I assume that a language naturally operates its machineries within levels. Therefore, the stratification in Stratal OT is convenient descriptive tool to represent the natural levels of a language. However, linguists should be involved in defining the confines that distinguish each natural level.

The theoretical support for a *level representation* in Arabic to captures the facts of this language is attested in the literature. The recognition that the phonological structural realizations in Arabic differ based on a surfaced-level theoretically has been established long time ago. For example, papers such as McCarthy and Prince (1990), which develop the theoretical account on *only* 'stem form' where they recognize a 'stem form' as 'abstracts away from the effects of phonological rules and the addition of inflectional affixes from agreement, mood, and case marking systems' (McCarthy & Prince, 1990:1), demonstrate the role of such suffixes on the phonological structures in a way that raises a need for a different account that captures the phonology and morphology interface. I consider their work an acknowledgment for a ***stem surface level***; even though I do not agree with its stem-domain[25]. Moreover, early theoretical works, such as McCarthy (1979/1985) and Broselow (1992), have already utilized the expressions that indicate to surfaced-levels of realization. For instance, in

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[25] Even though, McCarthy & Prince's (1990) domain for a stem in Arabic corresponds to the ALT tradition, but to avoid complexity, I decided to restrain the domain of stem to different criteria, as will be seen.

the position of contrasting with Classical Arabic, McCarthy (1979/1985: 28) states that in Cairene Arabic Colloquial and Damascene Arabic Colloquial, the syllables CVVC and CVCC are not restricted to 'phrase-final but to word-final position' 'in underlying representation'. The context in which this statement appears (see McCarthy, 1979/1985: 26-28) makes me conclude that the term 'phrase-final' is meant to be when pausing at the end of a phrase/sentence, whereas the term 'word-final' might be the contrast of such position. Hence, based on McCarthy (1979/1985) the surface of the two syllables is not limited to the end of a sentence in the two aforementioned Arabic dialects[26]. Accordingly, the notion of a surfaced-level in McCarthy (1979/1985) is expressed within specific concept. It appears related to the *location* in which the word is realized in a phrase/sentence. This recognition for the importance of the location of words is recognized in this study terminologically and conceptually through the terms context and pause which are translations for the ALT terms الوصل *ʔal-waṣꜥl* and الوقف *Al-waqf*. Thus, his distinction between phonological structural realizations of a word in Arabic acknowledges binary surfaced-levels. The distinction of words-location in a phrase in Arabic is an early established fact in ALT tradition as one can see in the early sources, (e.g., Sibawaih's book).

Broselow (1992) was found recognizing three levels in the grammar of Arabic, these are, stem-level, word-level and sentence-level. In addition, she was found recognizing the criticality of 'phrase-final position' which is in this study is termed the pausal position. These recognitions were found reestablished within Stratal OT terminologies in Kiparsky (2003) and Watson (2007).

The fact that ALT and Western phonology recognize that in Arabic it is important to consider words-location in a phrase/sentence so that phonological structures of a single word is accounted for is a support that there are *Confines* that border each *level* in a *Language*. The establishments of the role of suffixation are also another support for this new suggested descriptive tool. The confines of a stratum/level are elements that seem to be bordering each level in the grammar of the Arabic language. The privilege about adopting the confines notion as an analytical tool that descriptively expresses boundaries of each stratum in a language is that *each* language is expected to end up with an agreed-upon specific number of strata. In addition, these strata are expected to be confined with agreed-upon confines. Hence, the aim of an analysis that is suggested for data is not restricted to account for a phenomenon

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[26]Contrary to McCarthy's words about Cairene Arabic colloquial, it was found that this dialect surfaces such type of syllables mainly in pausal forms, (see: section 4.4.2.1 in chapter four, the examples 12 and 13). That CVCC and CVVC are surfaced mainly in pausal position means that Egyptian Cairene Arabic, which is abbreviated in this study as ECA, just like CA, restricts the two superheavy syllables to the end of a sentence.

in a language; rather, it *broadens* to build a *detailed map* of the language in question. The detailed map consists of the different linguistic components organized so that they are informative as a whole for the internal system of this language. Building such a map requires a more co-operative type of work between a group of analysts from different linguistic fields who are devoting time and effort for only one language to end up with discovering its detailed map. The work also might require shoveling the *literatures* of this language and approaching native speakers. The plurality of the word literatures means that the work is not limited to shoveling the literature of WL, which is the general noticed type of reviews that one finds. Rather, it should include the literature which the experts of the language itself have accomplished. Even though WL makes uses from what are accomplished but mistakes exist. Generally, mistakes delay us from increasing our knowledge with a language; hence, they delay us from increasing our knowledge with Language.

This study is a step towards achieving a detailed map for the Arabic language. In this theoretical part of the research the goal is to come up with a suggestion for specific number of strata and their confines in Arabic. Future research, are thus expected, to evaluate the suggestions and modify them on the bases of what are discovered about the Arabic language. To explain, this study investigated mainly the monosyllabic CVCC nouns in different eras and variations to come up with findings that were accounted for within only three levels of representation. No theoretical extra work has been made to insure the argued three levels when assuming this number of levels to account for my monosyllabic stems. However, theoretically, I argue that the recognized three levels are what the grammar of Arabic consists. Yet, this argument needs substantiations by examining the argued three levels for other types of nominal stems, (e.g., disyllabic stems). In addition, the strata and the confines that separate each stratum were imposed with the goal of accounting for more different data. Still, the efficiency of the proposed confines for each stratum needs to be assessed. These two alerts are clarified due to their importance for future research. The focus next is on constructing the confines.

To construct the confines of strata for *nominal* Arabic words, it is important to mention that in this study the three levels segregation is adopted as distinct domains in which specific phonological processes are applied. According to the findings and what I know of Arabic, I suggest the following levels/layers: a stem-level, a word-level and a phrase-level. These layers are confined on specific recognitions of SA. The selection of SA is because it is the variation that is offering the underlying structures for all Arabic variations in the different eras. In addition, adopting the recognitions of SA is more convenient. This is because they

justify the existence of stranded moras in the modern era of Arabic as this well-kwon variety of CA preserves the case vocalic segment. They also grant the possibility of surfacing in the modern era the segmentations that were part of CA. This is important because of the noticed consonantal preservation which the modern Arabic dialects manifest.

The stem-level is suggested to be determined by not being inflected with any pronominal suffix, (i.e., possessives). However, considering the surfaces of stem-forms and inflected-forms, it is concluded that in the stem-level there are limited and specific affixes. These are the definite prefix /ʔal-/, which never occurs in word-level, but it may occur in stem-level and in a stem-form that is realized in the phrase-level. If a stem is attached to a pronominal suffix then this would be considered a realization in the word-level unless it realizes in a sentence/context, as this will mean that the word is surfacing in the phrase-level. The case inflections exist in the three levels whereas the nunation may exist mainly in the stem-level and phrase-level. Yet, in the phrase-level, the realizations of case vocalic suffixes and nunation suffix will be affected with their *locution* in the utterance, (i.e., whether they are a contextual form or a pausal-form). Therefore, formally, in the phrase-level there are two main sets of forms; contextual and pausal. The table 5.1 presents the proposed three strata for the assumed natural levels in Arabic. Each stratum is defined by the argued confines.

Strata	Confines
Stratum 1	(/ʔal-/: defiant affix)[27]+Stem+Case +(/-n/: indefinite suffix)
Stratum 2	Stem +Pronominal suffix
Stratum 3	Contextual form + Pausal form

Table 5.1: The strata for the natural levels in Arabic defined by the argued confines

By adopting these confines that borders the levels we will be able to show through Stratal OT framework the following facts. Firstly, the loss of the markers began diachronically in the phrase-level and *only* in the pausal position. Secondly, the epenthesis process emerged in the phrase-level as a consequence for the loss. Thirdly, CVCC syllable type, if it is accommodated in a modern dialect, will be represented within the exact level of realization. For instance, the analysis in 5.6 proposes an account for CVCC of ECA that shows that CVCC is presented mainly word-finally in pausal position in a phrase/sentence. Hence, CVCC syllable of ECA is represented in stratum 3 and only word-finally of a pausal

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[27] The brackets mean that the existence of the affix is *possible* in this layer but not obligatory.

form. In contrast, CVCC syllable of KħA is represented in the three strata as this dialect surfaces CVCC in context and in pause.

Another fact that is captured is the difference between the modern Arabic dialects in terms of the level of operating the vowel insertion. For example, the findings show that with the exclusion of ECA, all the other dialects operate the vowel insertion in the stem-level and the word-level. ECA, contrasting with the other dialects, operates the vowel insertion in the word-level but not in the stem-level. It is found that in both KħA, IBA, and to some extant MMA the epenthesis as a resolution for CVCC is blocked in the word-level because morphology supplies in specific categories the structures with vowel-initial suffixes. Notably, ECA in the word-level does not operate the epenthesis in the morphological categories that supply the structures with vowel-initial suffixes but it operates it, just like the other dialects, in the morphological categories that supply the structures with consonant-initial suffixes. Thus, ECA, just like IBA, KħA and MMA, blocks and operates the vowel insertion in the word-level and the conditioning of the blocking and operating in the four dialects is the suffix type. Therefore, the main difference is in terms of operating the insertion in the highest layer, (i.e., the stem-level) but in the lower level, (i.e., word-level) no difference is found in terms of the partial blocking and the partial operating. IBA, KħA and MMA operate the vowel insertion in the highest layer whereas ECA does not. However, the four dialects block and operate the insertion partially in the lower layer, (i.e., word-level).

On the other hand, based on the collected data, it might be thought that ECA operates the insertion mainly in one layer and that the other dialects operate it in two layers. However, the two sentences that were given from ECA and KħA in the previous chapter provided the realization of monosyllabic nouns in context (see: section 4.4.2.1; the examples 12 and 13). These data show that ECA operates the insertion in another layer, that is, the lowest layer, (i.e., the phrase-level). The aforementioned two examples show that, in contrast to KħA, the epenthesis is operated contextually in the phrase-level in ECA. Hence, it can be confirmed that ECA operates the insertion in the two low layers; the phrase-level and the word-level. I do not have data from MMA and IBA that informs about operating the vowel insertion in context; however, as far as the KħA data in (12) and (13) in 4.4.2.1, it appears that KħA does not operate the insertion in the phrase-level. This issue is significance for the notion *the life cycle of phonological processes* which will be addressed in chapter six. Nonetheless, the generalizations about operating/blocking the insertion process can be captured because of the level segregation which is a characteristic in Stratal OT. The proposed confines enhance our understanding of the level segregation as they define the domain of each level/stratum. In

addition, the confines as a tool enrich the theoretical tools of Stratal OT to show how variations of a language have the same confines that border strata but simultaneously the processes that are operated in the strata are different. In another words, the variations of a language agree on the number of strata and in the confines that border each stratum but they differ in terms of the processes that operate in each stratum.

As for what support the argued confines that border each stratum in Arabic, (see: table 5.1 above):

1- The findings that were discovered about the CVCC syllable and the repair processes.
2- Distinctions between the contextual form and pausal form of the same word is already established whether in ALT tradition or in Western phonology.
3- A known prosthesis process in Arabic that differs based on the level of realization. This process is investigated thoroughly in the WL literature.
4- Assimilation processes that I have noted while I was collecting my data from the Qur'anic readings.
5- The established facts about the realization of case inflection and the realization of CVCC in the classical era.
6- The affixes /ʔal-/ and /-n/ never attached to an inflected-noun with a pronominal suffix in Arabic.
7- The optionality of /ʔal-/ and /-n/ is because they are never realized in the same noun.

I cannot claim that these are conclusive confines for the strata in Arabic, but for this study they appear accomplishing well in accounting for the different phenomena. Future research may develop modifications. Note that due to specific type of realizations, I think that there is a need to recognize **initial-forms** in the phrase-level next to the contextual-forms and pausal-forms. This need is because I know that whereas the known prosthesis may appear in an initial-form in the phrase-level, it never appears in the contextual-form or in the pausal-form of the same word. In contrast, the initial-form escapes some assimilation processes, which are operated in the lift-edge of the other words that are realized in the phrase level. This escape is because the lift-edge of an initial-form, in contrast to the pausal-form and the contextual-form, is free. Thus, I argue that, for Arabic, it is better to recognize the words in the phrase-level in terms of their *location* in a phrase. The diagram below shows how I envisage the phrase-level in the Arabic language. It represents a sentence of five words.

Initial-form   contextual-form, contextual-form, contextual-form   Pausal-form

↓   ↓   ↓

The left
-edge   Both left-edge and right-edge   The right-
edge
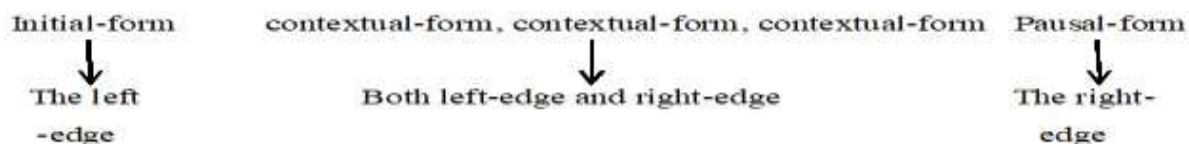
The five words in the sentence are referred to in terms of the location of realization; hence, there are one initial-form, three contextual-forms and one pausal-form. The contextual-forms undergo the same processes. However, the last word, (i.e., the pausal-form) and the first word, (i.e., initial-form) in the sentence share that each has a free edge. This free-edge is the right-edge for a pausal-form and the left-edge for an initial-form. The connected/occupied edge undergoes the same processes of a contextual-form. The right-edge of a pausal-form based to the results of this study, is the edge in which the innovation of CVCC syllable has been introduced in Arabic and it is the edge in which all the repair strategies appeared in. The prosthesis process is known to be restricted to the left-edge of an initial-form, thus, I think that implementing the initial-form as another sub-domain in the phrase-level should be considered seriously. Thus, future researches are encouraged to investigate more thoroughly around the importance of imposing such subdomain.

5.5 Syllable well-formedness and moraic conservatism

As far as the results that were obtained in this study, we can see that the syllabic inventory in Arabic today consists of CV, CVV, CVC, CVVC, CVCC and CCVC. The distribution of these syllables in the modern Arabic dialects is different. The light and heavy syllables CV, CVV and CVC are more canonical than the superheavy syllables in all modern Arabic dialects and are not restricted to specific regions. The superheavy syllables CVCC, CVVC and CCVC are not mainly less canonical but in terms of their distribution it appears that there are regional restrictions. Whereas the superheavy syllable CVVC is the widest distributed in the modern Arabic dialects, the superheavy CCVC is the less distributed. This conclusion is because the syllable CVVC was not restricted except word-middle in ECA whereas the syllable CCVC was found in a conditioned environment mainly in MMA. This environment, as far as the generalizations that were formed based on the MMA collected data, the monosyllabic stem CVCC that has the potential to violate SSP due to the loss of case suffixes. As for the CVCC, it has been generalized that IBA does not permit CVCC to surface. In terms of the lifespan of each of the three syllables, CCVC is the youngest superheavy syllable of the three superheavy syllables as it did not exist in the classical era. As for the syllables CVVC and CVCC, there is no evidence that suggests which one of them is the older as far as I know. The documentations of the classical era show that both CVVC and

CVCC were conditioned to pausal position and that they were direct results for deleting the case inflections. Therefore, the role of the loss of the vocalic markers in increasing the syllable inventories of Arabic is clear. It appears that phonology accommodates the superheavy syllables CVVC, CVCC and CCVC on the expense of losing the stranded mora of the lost vocalic case. Hence, theoretically this can be stated as following: in Arabic there is a conflict between syllable well-formedness and moraic conservatism.

The ranking that accounts for this conflict mechanically has to describe how the new syllable types have been introduced to the Arabic syllabic inventory. It also has to express the noted phenomenon of moraic conservatism which is argued to be the reason behind the similarity between words in Arabic; *lexically the words of the past are so similar to their modern heirs and the modern heir are so similar to each other*. Thus, the conflict in the analysis is between syllable well-formedness constraints and the moraic conservatism constraints. The target of this conflict is to remain lexically similar within systematized variations. This section is organized within three subsections to represent the two categorized processes that are classified in terms of their role in the moraic conservatism, (i.e., those that lead to moraic stability and those that do not). Therefore, the goal in the analysis is to demonstrate that there are moraic faithfulness requirements that condition syllabic change so that the variations of Arabic remain lexically similar.

Accordingly, assuming the Bimoraicity minimal word condition that was formulated in Broselow (1992) for Arabic, theoretically, I show in the following subsections that there are processes in Arabic that are operated for moraic conservatism and others are not. The processes that motivate moraic conservatism are vowel insertion, case-metathesis, compensatory lengthening and substitution. In contrast, the deletion and root-metathesis, (i.e., the CVCC→CCVC shift) are processes that do not contribute to preserve the weight of words in Arabic. The main theoretical argument is that the floating mora of the lost case segment has either undergone stabilization through weight adjustment, (i.e., reorganizing the morae on the segments that form a word) or lost.

5.5.1 Moraic stability processes

The moraic stability processes are observed in the following subsections in both stem-forms and inflected-forms.

5.5.1.1 In stem-forms

Starting with vowel epenthesis, in the classical era, the word "sea" unless being a pausal form, then it will be realized as *baħr-V* where V is a case suffix. By examining the modern

dialects it is found that *baħar*, a realization of IBA and KħA that display vowel insertion preserve the mora count of the most surfaced-form of the classical era for this word, (i.e., the contextual form) contrast the representations in (18a) and (18b) below.

(18a)   (18b)

The representation in (18a) represents the moraic weight of the contextual form of the classical era, whereas (18b) shows the moraic structure of IBA and KħA. The two realizations are in the stem-level. Clearly, the mora count has been preserved though not the positions as syllabically, the stem-form of the classical era surfaces heavy-light syllables whereas the stem-form of IBA and KħA surfaces light-heavy syllables. Thus, the modern stem-form still surface as a disyllabic noun that still consists of heavy and light syllables but differs in the ordering of these two syllables. This indicates that there is minimizing for syllabic innovation as the structure (18b) displays that there is preservation for the number of syllables and for their types. Notably as well, the phonetic values of the two surfaced-forms are almost the same. The only difference in this respect is that the phonetic value of V is variable displaying the case markers /a, i, u/ in (18a) contrasting in this with the non-variable value of the vocalic [a] which was inserted to associate the stranded mora of the lost case segment in (18b). Therefore, the stranded mora of the lost vocalic case marker has undergone stabilization.

The case-metathesis process, which is documented in Sibawaih's book, also contributes towards the moraic conservatism, see /bakr-V/ "A name for a person" in (19).

(19a)   (19b)

Notably, the effect of the case-metathesis equals the effect of the vowel epenthesis in terms of minimizing the syllabic innovation as (19b) shows that the modern structure preserves the number of syllables that are forming the stem-form and the types of these syllables.

Syllabically, the only difference again lays on the ordering of the surfaced types of syllables, (i.e., light-heavy instead of heavy-light). However, in terms of the phonetic value, V in the contextual form of /back-V/ is variable for one of these vocalic case values /a/, /u/ or /i/. On the other hand, it is acknowledged that the pausal form of /bakr-V/ in the eight century displays the case-metathesis, (i.e., NOM-metathesis and GEN-metathesis). Hence, if (19a) is a representation for the pausal form not contextual form, then in V is variable to either the value /i/ or the value /u/. The variability of V in the classical era contrasts with the non-variability of *V* in the modern era (19b). The two different modern realizations for /bakr-V/, (i.e., the KħA [bak*i*r] and the Makkan Arabic [bak*u*r]) that I found display the non-variability of the metathesized vowel; either [i] or [u] in a dialect.

The substitution of the root-final glottal stop, (i.e., CVCʔ) with a glide also contributes towards moraic conservatism in (20) though in a different way. Observe that the glottal stop in the realization of the classical era was onset; hence, it was a weightless consonant. Therefore, its deletion would not leave a direct stranded mora as it is not essentially associated with a mora. Nonetheless, its role in satisfying the maximally bimoraic constraint in Arabic, which Broselow (1992) formulates, is recognizable. This is because the glide substitution allowed the rearranging of the segmentation in a way that preserved the number of syllables that are surfaced which in turn satisfied the maximally bimoraic condition in a syllable. To explain, even though it is inserting [u] what conserves the stranded mora of case but without the substitution this moraic conservatism will lead to surfacing a syllable with three moras (see 21). As far as Broselow's (1992) constraint in Arabic the syllables are maximally bimoraic.

(20a)   (20b)

"9b in KħA and IBA"
"part"

(21)
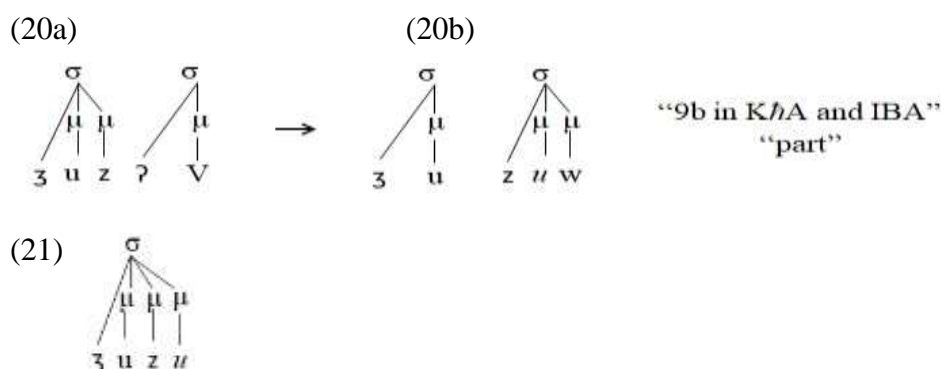
The preservation for the number of syllables in the modern structure which is represented in (20b) sustains that the syllabic innovation is minimized. Observe as well that the types of syllables that are forming the structure of the noun in (20a) and (20b) are the same but differ mainly in the ordering. This means the minimality in syllabic innovation is

intended in Arabic and not arbitrary. To explain, so far all the examples display consistently that the modern structure differ from the classical structure in firstly the variability of the phonetic value of only one segment and secondly the ordering of syllables. The structures that belong to different eras are similar in the moraic weight, syllable number and syllable type. The similarity in the root-consonants is also observable in the structures of the two eras as most data show that the root-consonants are preserved.

The representations in (22) below represent the word /raʔs-V/ "head" which has a moraic glottal stop. The investigation showed that there is compensatory lengthening process that followed the deletion of the root-middle glottal stop, (i.e., CVʔC). This compensatory lengthening process, which is found in the data of the classical era, did not contribute towards the moraic conservatism of the lost case mora but it contributed towards preserving the stranded mora of the lost moraic glottal stop in the CVʔ.C-V sequence. Based on the establishment of McCarthy and Prince (1990: 17), in Arabic there is a minimal stem requirement of two moras. I argue that the moraic conservatism, which the mora of root-middle glottal stop has undergone, is targeting the satisfaction of this requirement.

(22a)   (22b)

The modern data, in contrast to the classical data, show that the root-middle glide in CVGC has also undergone deletion and compensatory lengthening. This is represented in (23) for the /zawʒ-V/ "spouse as far as the classical meaning, husband or two as far the modern meanings". Hence, the moraic conservatism in CVGC and CVʔC is for a mora of root-consonant not the mora of case suffix. In addition, the target of this moraic conservatism is the same in CVGC and CVʔC, (i.e., satisfying a bimoraic minimal stem requirement). The KħA pronunciation of /zawʒ-V/ is what is transcribed in (23b) whereas in (23a) the contextual form of the classical era is represented.

(23a) (23b)

ω
|
Σ
|
σ

σ   σ   →   μ μ
μ μ μ   z u u   ʒ
z a w ʒ V

Regarding the minimal stem requirement of two morae in Arabic, it is worth to mention that the whole collected data, (modern and Classical) display only one realization that dissatisfies this requirement. A monosyllabic root/stem was found realizing as CV in its stem-form. This CV stem-form realization might be taken as a falsification for the existed of the bimoraic stem requirement in Arabic because it can be taken as evidence that Arabic has a monomoraic realization for a stem. The obtained CV realization, (i.e., [ʃi]) was in MMA for the stem /ʃajʔ/. It might be thought that since MMA displays several idiosyncrasies then the monomoraic stem is another idiosyncrasy of this dialect. However, I was informed that the stem /ʃajʔ/ is not part of the vocabulary of MMA. Thus, the possibility of falsifying the minimality requirement through this stem is refuted for me. Nonetheless, recall that conceptually the term 'stem form' that is defined in McCarthy & Prince (1990) differs from the *stem-form* that is defined in this study. The 'stem form' in McCarthy & Prince (1990), which approaches the case Arabic variety SA, is an abstraction from the vocalic markers and other affixes. For this study, such abstraction means that we are dealing with the root of a word not the stem-form. The stem-form for a case and caseless Arabic variety is as has been shown in table 5.1 when introducing the notion confines which does not exclude the root but it is not limited to it[28]. Thus, I argue that in Arabic the bimoraic requirement is a root/stem/'stem form'. I also argue that this bimoraic root requirement is a prosodic requirement in Arabic. The bimoraic requirement of Arabic roots is sustained as a prosodic requirement because the 60 CVCC investigated roots/stems/'stem form' surface in the modern era as CVCC, CVCV, CVVC, CVCVC or CVV. The exclusion for this finding is the one overlooked CV realization of MMA. Based on this, minimally a stem-form in Arabic is bimoraic.

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[28] Observe that the root is generally the pausal form of a word. Hence, the root can surface as a stem-form in the phrase level word-finally.

5.5.1.2 In inflected-forms

Moving to the inflected-forms, in (24), (25) and (26) below the IBA inflected-forms of /ʃahr-V/ "month" are contrasted structurally with the SA inflected-forms for the same stem-form.

24. 1Pers

	Sing	Plur
24a SA	[ʃa$^{\mu}$h$^{\mu}$.ri$^{\mu}$i$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.na$^{\mu}$a$^{\mu}$]
24b IBA	[ʃa$^{\mu}$h$^{\mu}$.ri$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.na$^{\mu}$]

25. 2Pers

	Sing.Masc	Sing.Fem	Plur.Masc	Plur.Fem
25a SA	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.ka$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.ki$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.ku$^{\mu}$m$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.ku$^{\mu}$n$^{\mu}$na$^{\mu}$]
25b IBA	[ʃa$^{\mu}$h$^{\mu}$.ra$^{\mu}$k$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.ri$^{\mu}$ʧ$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.ku$^{\mu}$m$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.ʧa$^{\mu}$n$^{\mu}$]

26. 3Pers

	Sing.Masc	Sing.Fem	Plur.Masc	Plur.Fem
26a SA	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.hu$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.ha$^{\mu}$a$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.hu$^{\mu}$m$^{\mu}$]	[ʃa$^{\mu}$h$^{\mu}$.rV$^{\mu}$.hu$^{\mu}$n$^{\mu}$.na$^{\mu}$]
26b IBA	[ʃa$^{\mu}$h$^{\mu}$.ra$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.ha$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.hu$^{\mu}$m$^{\mu}$]	[ʃa$^{\mu}$.h*a*$^{\mu}$r$^{\mu}$.hi$^{\mu}$n$^{\mu}$]

Assessing the data in (24), (25) and (26) show that vowel epenthesis contributes towards preserving not only the mora count of a classical structure but also the syllable number that forms this structure. Hence, the structural preservation role of vowel epenthesis is not limited to stem-form. Yet, the extent of this contribution should be investigated. Next, starting with the mora count, the role of vowel epenthesis in preserving the mora count and syllable number in inflected-forms is explained in brief words.

The contrasts between the inflected-forms in the categories 2Pers.Plur.Masc and 3Pers.Plur.Masc display the preservation of mora count well. Five morae are counted in the SA classical structures in contrast to the same number of morae in the IBA modern structures. The mora count of the other IBA structures does not equal the mora count of the SA structures. The mora count of IBA structures in 1Pers.Plur, 2Pers.Sing.Fem, 2Pers.Plur.Fem, 3Pers.Sing.Fem and 3Pers.Plur.Fem are less from the mora count of the SA structures with mainly 1 mora. This difference in mora count between the modern and the classical mora counts might refute the argument about the vowel insertion role in preserving mora count because the vowel insertion is operated in the modern IBA structures in these categories. Yet, observingly, the mora count is less in the modern structures not because the case's mora has not been preserved but because there is another moraic segment that is lost. As can be seen from contrasting SA and IBA pronominal suffixes in 1Pers.Sing, 1Pers.Plur and 3Pers.Sing.Fem, the final long vowel has been reduced in length without any kind of compensation in the modern structures. Another form of reduction is found in the IBA

suffixes that express 2Pers.Plur.Fem and 3Pers.Plur.Fem which both surface lacking a CV final-syllable in contrast to SA structures. Because the onset is weightless the loss of a light syllable equals the loss of a moraic segment. The two forms of reductions cause, therefore, losing mainly 1 mora in the modern structures. In contrast to case's mora, which has been saved through vowel insertion, the mora of the lost V and CV did not undergo conservatism. This mora might have been saved by implementing another vowel insertion but as can be seen in the structures above, there is only one vowel epenthesis. The locus of the inserted vowel demonstrates that the stranded mora that has been saved through reassociation belong to the case not to other lost moraic segments.

The role of vowel insertion in saving the stranded mora of case is even sustained more by recognizing that non-operating it in a modern structure *may* lead to reducing the mora count. Operating the vowel insertion in a modern structure means that the stranded mora of case has relinked to an inserted vowel whereas non-operating it means that if this stranded mora did not find an appropriate association with a segment then it is lost. The substantiation that supports this argument is explained through those IBA inflected-forms which do not operate vowel insertion (observe them in 24, 25 and 26). In such structures, which are formed by combining a base with a vowel-initial, the mora count is either preserved or not preserved. The case's mora was saved in 2Pers.Sing.Masc and 2Pers.Sing.Fem because morphology is supplying a rhyme that consists of nucleus and a coda but it was lost in 3Pers.Sing.Masc because morphology is supplying a syllable that consists of only nucleus. What morphology is supplying in all these categories is due diachronic change that affected suffixes. Diachronically, the contrast between SA structures and IBA structures in 2Pers.Sing.Masc and 2Pers.Sing.Fem shows that the VC rhyme-suffix was the CV syllable-suffix. Hence, the C in the supplied VC rhyme-suffix is weightless because diachronically it was onset. This morphological supplement of a rhyme-suffix that possesses a weightless coda saved the stranded mora of case. This is because prosodically the syllable CVC has to be heavy in Arabic not light. To repair the light VC in the new formed CVC the stranded mora of case was relinked to the weightless coda. Therefore, the metathesis that changed the structure of the suffix from being the light syllable CV to be the ungrammatical light VC was essentially operated to save the stranded mora of case. It motivated establishing new association to relink the mora of the lost case. This shows that morphology and phonology incorporated their powers to reduce structurally the effects of the loss of case on the moraic weight.

In contrast, the onsetless rhyme-suffix V, which diachronically was the CV syllable-suffix as can be seen from contrasting between IBA structure and SA structure in

3Pers.Sing.Masc, saves a final-extrametrical C. The unique about this final-extrametrical is that it is a root-consonant. I argue that the loss of the onset that left the suffix with an onsetless V rhyme, (i.e., a syllable that consists of mainly nucleus) is to protect the final-extrametrical C because it is a root-consonant. The support for this argument comes from the massive amount of preservation for root-consonants which Arabic variations exhibit. This massive amount of root-consonants preservation is assumed to be achieved through minimizing their change. The minimizing of root-consonants change has been done through employing protection processes so that their change is monitored to preserve them through long span. However, I find the selection to reduce the suffix to be mainly an onsetless rhyme instead of operating the vowel insertion which would have saved the stranded mora of case and protected the extrametrical root-consonant bizarre in Arabic.

Arabic, just like Hebrew and presumably the other Semitic languages, display high preservation for functional elements including the pronominal suffixes in particular the consonantal segments that form these elements. Hence, just like content words the consonants that form the functional elements are preserved for long span in these languages (see the pronouns of Hebrew and Arabic in 6). Thus, the selection to be less caution with the suffix [-hu], which functionally expresses 3Pers.Sing.Masc, is not consistent with what is known about the change in Arabic. Observe that losing the glottal fricative onset leaves this element as mainly an onsetless and codaless syllable. Whereas prosodically Arabic allows codaless syllables, it does not allow onsetless syllable. Thus, the loss of the glottal fricative here is of significance in terms of its impact which implies that there is a phonological attempt to introduce an onsetless syllable type to the Arabic syllabic inventory. However, as far as I know, there is no Arabic dialect that has this syllable type word-finally which is where the resulted syllable [-u] would surface because the pronominal possessives of Arabic are suffixes. As far as the IBA structure above and the structures of MMA, ECA and KħA for the stem, which can be found in the appendixes 3, 4, 5 and 6, the onsetless syllable of 3Pers.Sing.Masc is resolved. In fact, the onsetless syllable of the 3Pers.Sing.Masc is resolved in all the stems of the four investigated dialects as can be seen from the appendixes 3, 4, 5 and 6. Thus, since it ended by being resolved the burden of making the efforts to form this onsetless syllable as a suffix is meaningless unless there is a good motive that excuses the burden.

A counter opinion may argue that the finding that a suffix has ended up to be mainly a vowel is not unique in languages. In addition, it may argue that Arabic has vocalic suffixes such as the case suffixes. However, a replay for this counter opinion is that unlike the case

suffixes the 3Pers.Sing.Masc suffix is not lost and there is no indication that it is going to be lost considering that it is wide distributed. The onsetless syllable that marks 3Pers.Sing.Masc was found in the modern collected data as [-u] in ECA and MMA and as [-a] in IBA and KħA. No verbal indication has been given that may lead one to suspect the strong position of the 3Pers.Sing.Masc suffix in these investigated four modern Arabic dialects. As far as the collected data itself, a glottal fricative [-h] was found marking 3Pers.Sing.Masc in three of the four investigated modern dialects. This glottal fricative suffix was found marking only when the monosyllabic CVCC stem/root is surfacing as a CVCVV base or CCVV base. The CVCVV base inflected to CVCVV-h to express the 3Pers.Sing.Masc in ECA and KħA whereas in MMA the base CCVV inflected to CCVV-h. Therefore, 3Pers.Sing.Masc in these three dialects can be marked by [-h] or the onsetless syllable, (i.e., [-u] or [-a]). This means that the glottal fricative, which diachronically was the onset of the mother suffix, is not lost. Rather, what happened is that the mother suffix, (i.e., [-hu] as far as SA variation) underwent a segmental split to form the main morpheme, (i.e., the vocalic [-u] or [-a] depending on the dialect) and its consonantal allomorph [-h]. The segmental split was followed by restricting the new units to different phonological environments to mark 3Pers.Sing.Masc. The argument that synchronically the vocalic is the morpheme and the consonantal is its allomorph is because of the amount of structures which each unit is surfacing in. The consonantal [-h] was found in only 1 stem whereas the vocalic [-u]/[-a] was found in the rest of the 60 stems[29]. The stem /difʔ/ "warmth" is the one that displays the consonantal allomorph in 3Pers.Sing.Masc category (see: the table 3.3 in each of the appendixes 3, 4, 5 and 6, cell 20). Notably, even though IBA surfaces the base CVCVV just like MMA, ECA and KħA but it does not surface the consonantal morpheme in the category 3Pers.Sing.Masc. IBA was found displaying mainly the vocalic morpheme in all the collected data. The findings in the four dialects are discussed briefly below.

It was found that ECA realizes /difʔ/ [dafaa-h], MMA realizes [dfaa-h] and KħA realizes [difaa-h] to express "warmth .3Pers.Sing.Masc". As can be seen, the glottal fricative allomorph is the infected suffix in these structures. The glottal fricative suffix is in coda forming the **superheavy** CV.**CVVh** instead of the **heavy** CV.**CVV** syllable in ECA and KħA whereas in MMA the **superheavy CCVVh** is formed instead of **CCVV**. Thus, it is syllabically complicating the realized structure without threating the moraic weight. The

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[29] Confirming that the onsetless syllable is the main morpheme whereas the consonantal is the allophonic requires investigating other types of nominal stems. In KħA the following disyllabic nouns are examples for nouns inflected with [-h]: [ʃifaa-h] "cure.3Pers.Sing.Masc" and [ridˤaa-h] "satisfaction.3Pers.Sing.Masc".

synchronic extrametrical position which [-h] is occupying is prosodically suitable. Being weightless extrametrical coda, the glottal fricative does not form a tri-moraic syllable which Arabic prosodically does not allow. This prosodic suitability has been formed through reordering the association of [-h]. In the mother suffix, the glottal fricative is a nonmoraic segment that is associated as onset of a light syllable whereas in the allomorph it is associated as a nonmoraic extrametrical segment. Hence, the non-moraicity of the glottal fricative has been preserved through suitable prosodic associations.

On the contrary, the rest of the collected data in the category 3Pers.Sing.Masc of the three dialects are inflected with the vocalic morpheme. This evolved onsetless morpheme is supplied as a rhyme for the bases CVCC and CVVC in the three dialects, as far as the data that are in the appendixes. MMA data displays that the onsetless morpheme surfaces also with the following bases CCVC, CC and CCVVC. Therefore, the onsetless morpheme reshapes the monosyllabic structures to be syllabically less complex as can be seen from below in (27).

27a. CVCC→CVC.C*V*
27b. CVVC→CVV.C*V*
27c. CCVC→CCV.C*V*
27d. CC→CC*V*
27e. CCVVC→CCVV.C*V*

The conclusion that is formed from this is that even though the phonology of these Arabic dialects allows complexity monosyllabically but the complexity is avoided in disyllabicity through morphology. In other words, in MMA, ECA and KħA the more increased the number of syllables that form a syllabic structure the less complex were the syllables that form it. The increase in number of syllables and the avoidance of complex syllables are due to phonology-morphology interface.

The inflected-forms of /difʔ/ in IBA exhibit the two bases CVCC and CVCVV. The conclusion that is formed from observing the paradigm of /difʔ/ is that the phonology of IBA, just like the other three dialects, also targets syllabic simplicity in bigger syllabic structures. However, this target is achieved through a different technique. The bases CVCC and CVCVV are technically employed instead of employing the morphemic suffix and its allomorph. Each of the two bases was found inflecting with specific suffixes. Notably, the CVCVV base inflects mainly with consonant-initial suffixes. Phonologically, these suffixes are a syllable; heavy or light. Thus, the initial-consonant in these suffixes is an onset of a rhyme that is part of the morphological unit. Because of the phonological structures of the

216

morphological unit, (i.e., CVC or CV), the base CVCVV has two reshaped forms. The CVCVV base was found in 2Pers.Plur.Masc, 2Pers.Plur.Fem, 3Pers.Plur.Masc and 3Pers.Plur.Fem reshaped to CV.CVV-CVC. In 1Pers.Plur and 3Pers.Sing.Fem the CVCVV was found reshaped to CV.CVV-CV. Clearly, the two reshaped forms end with avoiding the formation of CVVC word-finally in the tri-syllabic reshaped forms. Hence, the phonology-morphology interface avoids the complex superheavy CVVC in the penultimate although monosyllabically IBA does not avoid it in the ultimate. The other base, (i.e., CVCC) was found attached to mainly vowel-initial suffixes. These vowel-initial suffixes functionally resolve the phonological complexity of CVCC by reshaping it to either CVC.C-V or CVC.C-VC. Thus, considering what has been established about the syllable CVCC in IBA, it appears that IBA prohibits the realization of CVCC regardless the positions in which this syllable is realizing in, (i.e., ultimate, penultimate and possibly the anti-penultimate). This confirms that CVCC has not been adopted in the grammar of IBA.

Pursuing the issue of the bizarreness of the loss of the glottal fricative in the suffix [-hu], observingly, IBA vowel-initial suffixes are [-i] 1Pers.Sing, [-ak] 2Pers.Sing.Masc, [-iʧ] 2Pers.Sing.Fem and [-a] 3Pers.Sing.Masc. The vowel-initial suffixes [-ak] and [-iʧ] diachronically were the syllables [–ka] and [-ki] as far as the classical SA variation. Thus, metathesis and affrication processes changed the classical syllable-suffixes [–ka] and [-ki] to the modern rhyme-suffixes [-ak] and [-iʧ]. Thus, instead of losing the glottal fricative of the 3Pers.Sing.Masc, (i.e., [-**h**u]) a metathesis would have performed the required phonological function, (i.e., prohibiting syllabic complexity). The metathesis would have structured [-uh] from the mother suffix [-hu]. Selecting the loss of the glottal fricative [h] over preserving it through metathesis in the suffix 3Pers.Sing.Masc is of high significance. In Arabic the glottal fricative [h] is the shared segment in all the pronominal suffixes and words that express 3Pers. Thus, the fricative [h] in 3Pers appears as a consonantal marker for this group of functional elements. The pronominal suffixes that express 2Pers also have a consonantal marker, this is, the voiceless velar plosive [k]. However, in contrast to those functional elements that express the feature 3Pers, the voiceless velar plosive [k] is shared mainly in the suffixes that express 2Pers; hence, the 2Pers pronouns do not share [k]. Accordingly, the loss of [h] in 3Pers.Sing.Masc and the affrication of [k] in 2Pers.Sing.Fem and 2Pers.Plur.Fem in IBA are of morphological significance in Arabic. However, it has been seen that [-h] is not lost yet in ECA, MMA and KħA. As for IBA, there is the possibility that utilizing the base substitution instead of the morpheme and allomorph suffix substitution is an idiosyncrasy of mainly the stem /difʔ/. Assessing more and different data in the category 3Pers.Sing.Masc

might show that the allomorph [-h] still exist functionally in IBA. Nonetheless, I see the affrication in 2Pers and the split of [-hu] that made the glottal fricative an allomorph in 3Pers major morphological changes. Observing the directions of these changes may give clues that allow anticipating the future that is awaiting the Arabic language.

On the other hand, structurally, the inflected-forms of the IBA equal the inflected-forms of SA in the syllable count in the categories 1Pers.Sing, 1Pers.Plur, 2Pers.Plur.Masc, 3Pers.Sing.Fem, 3Pers.Plur.Masc. In the other categories, the structures of IBA are less with only one syllable from the structures of SA. Even though the operation of vowel insertion contributes towards preserving the syllable count but since the loss of elements other than case has not been phonologically compensated the operated vowel insertion is not sufficient. Furthermore, it is noticed that saving the stranded mora of case through morphological supplement does not preserve the syllable count. In the categories, 2Pers.Sing.Masc and 2Pers.Sing.Fem, the contrast between IBA suffixes and SA suffixes shows that a metathesis operated so that morphology supplies vowel-initial suffixes. The morphological supplement successfully saved the stranded mora of case but the expanse was losing 1 syllable and forming a heavy CVC syllable instead of the light CV syllable. Hence, the morphological vocalic supplements complicated the syllabic structure and reduced its syllabic length. Contrarily, the vowel insertion contributes towards saving the mora count, the syllable count without complicating the syllabic structure. Syllabically, the only noted effect is that it leads to reordering the syllables in a structure.

Regarding the case metathesis, which is another moraic stability process that was found documented in Sibawaih's book which belongs to the eighth century, the only word that I have as evidence for this process is /bakr-V/ 'A male person name'. This word is not part of the collected data but I managed to find its evidence in modern dialects through communications with native Arabic speakers. However, I do not have the complete set of the classical variation as Sibawaih does not give except the stem-form. Even though the complete set of the SA classical variation is attainable but this set would did not enlighten about the NOM-metathesis and GEN-metathesis which were operated in other classical variation. Therefore, I focus next mainly on the modern structures which I managed to find. Yet, be aware that because /bakr/ is used only as a name of a male the noun is not inflective for possessive pronominal suffixes. Yet, based on my own intuition, I offer the paradigm of the

KħA pronunciation of /bakr-V/ in (28) whereas in (29a) the 1Pers.Sing of Makkan Arabic's pronunciation is obtained from my Saudi friend[30].

(28) Stem pronunciation: [ba$^\mu$k*i*$^\mu$r$^\mu$]

(28a) 1Pers.Sing: [ba$^\mu$k$^\mu$r-i$^\mu$]

(28b) 2Pers.Sing.Masc: [ba$^\mu$k$^\mu$r-i$^\mu$k$^\mu$]

(28c) 2Pers.Plur: [ba$^\mu$k*i*$^\mu$r$^\mu$-ku$^\mu$m$^\mu$]

(28d) 3Pers.Sing.Fem [ba$^\mu$k*i*$^\mu$r$^\mu$-ha$^\mu$]

(28e) 1Pers.Plur: [ba$^\mu$k*i*$^\mu$r$^\mu$-na$^\mu$]

(28f) 2Pers.Sing.Fem [ba$^\mu$k$^\mu$r$^\mu$-iʧ$^\mu$]

(28g) 3Pers.Sing.Masc [ba$^\mu$k$^\mu$r-a$^\mu$]

(28h) 3Pers.Plur: [ba$^\mu$k*i*$^\mu$r$^\mu$-hu$^\mu$m$^\mu$].

(29) Stem pronunciation: [ba$^\mu$k*u*$^\mu$r$^\mu$]

(29a) 1Pers.Sing [ba$^\mu$k*u*$^\mu$r-i$^\mu$]

My anticipation is that the case metathesis is similar to the vowel insertion in terms of preserving the moraic weight and the syllabic count and type. The findings that were obtained from contrasting the stem-forms of both classical and modern eras (see section 5.5.1.1) support this anticipation. Still, the absence of the classical inflected-forms that the modern inflected-forms can be contrasted with leaves speculations around this in particular that I do not know the suffixes in that variety. However, when re-examining what Sibawaih (Haaruun's edition, 2009: vol.4: 173-176) says about the case metathesis, I have the impression that this process was noticed mainly stem-forms. If this is correct, then this is another difference that distinguishes between the case metathesis of the eight century and the vowel insertion of the seventh century. I leave this issue here due to the limitation of data.

Another moraic stability process is the substitution of the glottal stop with the glide /w/ that was noticed in the IBA and KħA's stem-form of /ʒuzʔ-V/. It is found that the IBA and KħA's inflected-forms retain the glottal stop. The vowel insertion that accompanies the glide is still operated in the IBA whenever morphology is not supplying a vowel-initial suffix. However, there are two epenthetic values, these are, [i] and [u]. The two values are in harmony with the root-vowel. If the root-vowel is the round [u] the epenthetic vowel is [u] whereas if it is the front [i] the epenthetic vowel is [i]. On the other hand, since the final cluster in /ʒuzʔ/ does not violate SSP the KħA inflected-forms do not exhibit a vowel insertion. The outline of this is that the inflected-forms of the two modern dialects are structurally consistent with the main generalizations that were formed about the two dialects. As for the risk of forming a trimoraic syllable, the retained glottal stop is fulfilling the prosodic requirement that prohibit a trimoraic syllable.

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[30] I am grateful to my friend Ender Taher for the help.

When discussing the stem-forms of CVʔC it has been recognized that the moraic conservatism processed only the stranded mora of the lost glottal stop. The floating mora of the lost case in these stems was not associated through any process of compensation. Hence, at the end the mora of case was lost itself. The stem-form of CVʔC stems is CVVC which resulted due to the lengthening of the vowel that was preceding the glottal stop. The collected modern data show that the four dialects do surface CVVC in the stem-form but in the inflected-forms they divide. In IBA, MMA and KħA the CVVC is resolved whenever morphology supplies a vowel-initial suffix but when it supplies a consonant-initial suffix no attempt is made by phonology to resolve the superheavy CVVC. In contrast, in ECA the CVVC is always resolved by either a supplement of vowel-initial suffixes or by operating shortening process that motivates the long monophthong VV. The distinct between the two groups of dialects, (i.e., IBA, MMA and KħA in contrast to ECA) on the moraic and syllabic structures can be noticed in (30) and (31). The complete set of /raʔs-V/ "head" based on the IBA pronunciation is offered in (30) whereas the set in (31) is based on ECA. The IBA set is provided as an example for those Arabic dialects that do not operate the shortening as contrast to ECA which operates the shortening. The selection of IBA over MMA and KħA is because IBA has more suffixes.

30. IBA set of [raas]	31. ECA set of [raas]	The category
Vowel-initial suffixes:		
30a. [ra$^{\mu}$a$^{\mu}$s-i$^{\mu}$]	31a. [ra$^{\mu}$a$^{\mu}$s-i$^{\mu}$]	(1Pers.Sing)
30b. [ra$^{\mu}$a$^{\mu}$s-a$^{\mu}$k$^{\mu}$]	31b. [ra$^{\mu}$a$^{\mu}$s-a$^{\mu}$k$^{\mu}$]	(2Pers.Sing.Masc)
30c. [ra$^{\mu}$a$^{\mu}$s-a$^{\mu}$]	31c. [ra$^{\mu}$a$^{\mu}$s-u$^{\mu}$]	(3Pers.sing.Masc)
30d. [ra$^{\mu}$a$^{\mu}$s-	31d. [ra$^{\mu}$a$^{\mu}$s-i$^{\mu}$k$^{\mu}$]	(2Pers.Sing.Fem)
Consonant-initial suffixes:		
30e. [ra$^{\mu}$a$^{\mu}$s-na$^{\mu}$]	31e. [ra$^{\mu}$s$^{\mu}$-na$^{\mu}$]	(1Pers.Plur)
30f. [ra$^{\mu}$a$^{\mu}$s-ku$^{\mu}$m$^{\mu}$]	31f. [ra$^{\mu}$s$^{\mu}$-ku$^{\mu}$u$^{\mu}$]≈[ra$^{\mu}$s$^{\mu}$-ku$^{\mu}$m$^{\mu}$]	(2Pers.Plur.Masc)
30g. [ra$^{\mu}$a$^{\mu}$s-ha$^{\mu}$]	31g. [ra$^{\mu}$s$^{\mu}$-ha$^{\mu}$]	(3Pers.Sing.Fem)
30h. [ra$^{\mu}$a$^{\mu}$s-hu$^{\mu}$m$^{\mu}$]	31h. [ra$^{\mu}$s$^{\mu}$-hu$^{\mu}$m$^{\mu}$]	(3Pers.Plur.Masc)
30i. [ra$^{\mu}$a$^{\mu}$s-tʃa$^{\mu}$n$^{\mu}$]		(2Pers.Plur.Fem)
30j. [ra$^{\mu}$a$^{\mu}$s-hi$^{\mu}$n$^{\mu}$]		(3Pers.Plur.Fem)

The distinction between the two sets is that CVVC is allowed in the ultimate and penultimate in IBA but in ECA it is allowed mainly in the ultimate. Yet, due to the vowel-initial supplement of morphology the final C in CVVC is reassociated as an onset instead of being extrametrical in both IBA and ECA. Therefore, in both dialects the syllable CVVC does not surface in the penultimate position when morphology supplies vowel-initial suffixes. However, when morphology supplies consonant-initial suffixes, in contrast to IBA, ECA

operates the shortening to resolve the CVVC in the penultimate. This proves that ECA prohibits CVVC in the penultimate whereas IBA does not. Overall, whereas operating and non-operating the shorting process have an impact on the syllabic structure it does not have impact on the moraic structure as a reassociation is formed when the vowel is shortened so that the mora is associated with the final C. Consequently, the extrametrical final C becomes a weight-contributing coda in ECA. In contrast, in IBA, the final C remains a weightless consonant. However, instead of being linked to the ω node it is adjoined to the mora that is headed by the long vowel to indicate that it is surfacing in the same syllable as a weightless coda. In (32) below prosodic representations is offered for 1Pers.Plur of both dialects.

32a. IBA   32b ECA
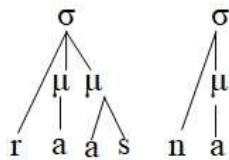
σ   σ   σ   σ
μ μ   μ   μ μ   μ
r a s   n a   r a s   n a
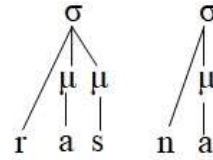
Therefore, the mora of the glottal stop has undergone moraic conservatism in both dialects. Moreover, even though the shorting is targeting a moraic segment in ECA but the mora remains preserved through reassociation.

In the stems with middle glide CVGC, which surface as CVVC in all investigated dialects, the shorting is operating in ECA to resolve CVVC in the penultimate. The dialects IBA and KħA do not attempt to resolve CVVC in the penultimate which again demonstrates that this superheavy syllable is prosodically accommodated in these dialects in the ultimate and penultimate positions. On the other hand, as mentioned in chapter four, IBA has two stem-forms for the stem /zawʒ/, these are, [zooʒ] "twosome" and [zawiʒ] "husband". Both stem-forms have inflected-forms. Notably, the stem-form that displays vowel insertion, (i.e., [zawiʒ]) is consistent in its inflected-forms with the generalizations that are formed about vowel insertion. As for [zooʒ] "twosome", the inflected-forms do not differ from those that are formed in KħA. Hence, no vowel shorting is operated to avoid the CVVC. As for MMA, the stem /zawʒ/ does not mean a husband or a spouse in this dialect. Rather, the stem /zawʒ/ surface in this dialect in its stem-form as [zuuʒ] and means 'the two'. Therefore, this stem-form does not have inflected-forms for poosisve pronominal suffixes. Yet, 1 have been provided with 1 inflected-form of the stem /zawʒ/, that is, [zuuʒ-ha] which supposedly means

"husband.3Pers.Sing.Fem". This structure shows that CVVC is allowed in the penultimate in MMA.

5.5.2 Non-moraic stability processes

In the following subsections, the non-moraic stability proceses are observed in the stem-forms and inflected-forms.

5.5.2.1 In stem-forms

Two non-moraic stability processes were discovered. The loss of the vocalic marker was essentially through a process of deletion. If this deletion was not repaired in terms of associating the mora of the deleted case vowel through other processes, then the floating mora of the lost moraic segment was not preserved. For instance, a tri-moraic stem-form $CV^{\mu}C^{\mu}C\text{-}V^{\mu}$ would surface, consequently, as a bimoraic stem-form $CV^{\mu}C^{\mu}C$. Therefore, the deletion is a non-moraic stability process that led to syllabic innovation unless it is followed by a repair process. The example (33) of /zarʕ-V/ "crop" gives the representations for the classical realization, (i.e., 33a) and the modern realization, (i.e., 33b). The modern realization is surfaced in two dialects, (i.e., KħA and ECA).

(33a) (33b)
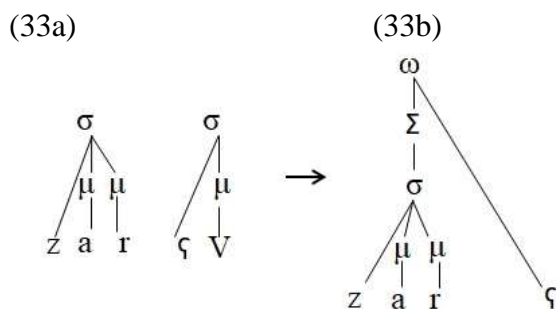
The CVCC→CCVC shift is another process that does not preserve the stranded mora of case. Essentially, the shift resolves the innovation of violating SSP. The principle SSP before the loss of case inflections was always satisfied in Arabic because the case suffixes functionally prevent the –CC final cluster in CVCC stems from surfacing adjacently. The representations in (34) are for the stem-form /baħr-V/ "sea". Whereas the representation in (34a) is from SA; the more common and wide spread variation in the classical era, the representation in (34b) is for the MMA realization. As can be seen from (34b), the MMA realization shows that the essential goal of the shift has been achieved but the side effects of this process was not avoided. Thus, in (34) it can be seen from the contrast that there is a reduction for the moraic weight of /baħr-V/. The mora count in the classical moraic structure

(34a) was three morae but the moraic structure of the MMA stem-form in (34b) consists of mainly two morae.

(34a)   (34b)
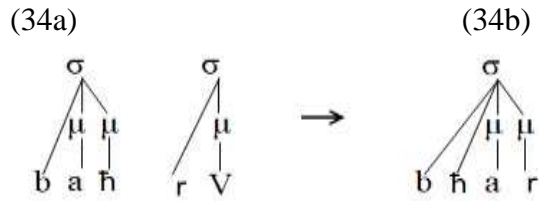
As for the syllabic innovation both non-moraic stability processes, (i.e., deletion and the shift) affect the syllabic structures. In terms of the length of the structure it becomes smaller and more complex in terms of the syllable type that forms the structure.
On the other hand, observe that the deletion process is the process that precedes all the processes. Hence, all the other processes including the shift are repair processes that work to repair phonologically a side effect. Whereas the moraic stability processes appear to be targeting more than one side effect, the shift is essentially provoked to repair mainly the SSP violation.

5.5.2.2 In inflected-forms

The moraic structures of the inflected-forms of the modern KħA and ECA in contrast to the classical SA display differences. Because KħA does not operate vowel insertion in the inflected-forms of /zarʕ/ whereas ECA operates the vowel insertion whenever morphology is not supplying a vowel initial suffix it is noticed that ECA preserves the stranded mora and syllabic count and type. In contrast, KħA does not preserve the moraic weight of the classical inflected-forms nor does it preserves its syllabic count and type. In (35) below the prosodic representations of /zarʕ-V-na/ "crop.1Pers.Plur" belong to SA [zarʕ-*V*-naa], ECA [zarʕ*i*-na] and KħA [zarʕ-na].

(35a)   SA

223

(35b) ECA

σ   σ   σ

μ μ   μ   μ

z a r ʕ *i* n a

(35c) KħA

σ   σ

μ μ   μ

z a r ʕ n a
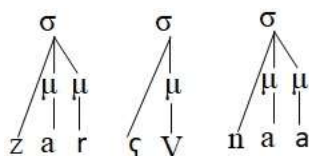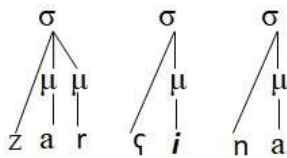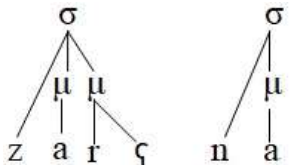
As can be seen, KħA is less in syllable count and in mora count than the classical SA whereas ECA is still preserving the syllable count. As for the mora count in ECA it is less than the mora count of SA but this is because of the loss of two moraic segments and inserting only one vowel, (i.e., the front [i]). Hence, saving only one stranded mora is found in ECA. Another difference between SA structure and ECA structure is the variability of V which donates the different case values, (i.e., [i], [a] and [u] in contrast to the non-variability of the inserted front vowel. As for the syllable types, the structure of KħA is displaying the most complex syllabic structure thought it is also the smallest one. Nonetheless, the representations in (35) are displaying a monosyllabic stem inflecting with consonant-initial suffixes. As mentioned before, due to phonological processes, the morphology in the modern era supplies the structures with vowel-initial suffixes. In (36) below another prosodic representations are given for the category 2Pers.Sing.Masc to contrast between the three Arabic dialects in the moraic and syllabic structures.

(36) SA

σ   σ   σ

μ μ   μ   μ

z a r ʕ *V* k a
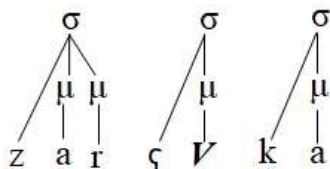
(36) ECA
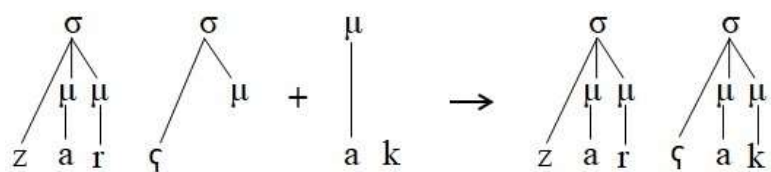
(36) KḥA
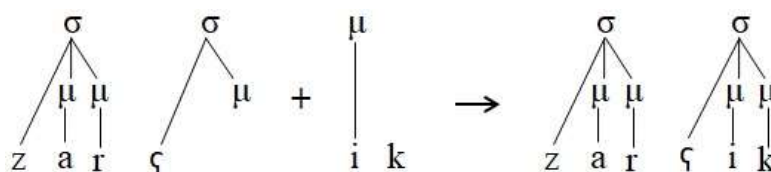
In the two modern dialects a syllable is lost because the nucleus is lost, (i.e., the case *V*). Since morphology reordered the segmentation of the suffix /-ka/, the onset [k] has been reassociated as a moraic coda and the nucleus of the 2Pers.Sing.Masc suffix remained without an association. Because the lost case vocalic left a stranded mora a new association is formed between this stranded mora and the nucleus of the suffix that lacks mora. Therefore, even though vowel insertion is not operated in both dialects but the mora count is preserved because of order segmentation which allowed new prosodic association that saved the stranded mora of case. The expense, however, is the loss of one syllable structure which a vowel insertion would have saved it.

As for the shift CVCC→CCVC in MMA, it was found in the stem-form of mainly 11 stems. Assessing them showed that 1 of the 11 displays the CCVC as a base morpheme in its entire paradigm. This is the stem /ʒiðʕ/ which its stem-form is [ʒdaʕ]. There is also the stem /barq/ which displays CCVC in the stem-form but in its inflected-forms the base morpheme is CVCC. The stems /baħr/, /fadˤl/, /siħr/, /riʒl/, /laħm/ and /ʕiʒl/ display different bases depending on the attached suffixes whether vowel-initial or consonant-initial. The last 3 stems are /ʃahr/, /fiʕl/ and /zarʕ/ that were classified among the arbitrary syllabic realizations. This means that their paradigms do not offer a complete systematic pattern.

As mentioned in 5.5.2.1 the shift does not contributes towards preserving mora count. This is has been seen in the stem-forms and it also can be seen in the inflected-forms. Consider the representation of [ʒdaʕ-na] "bole.1Pers.Plur" in (37) and the representation of [ʒdaʕ-u] "bole.1Pers.Sing.Masc" in (38) in contrast to the representation of the SA structures.

225

(37a) SA
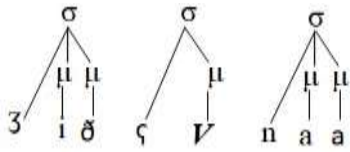
(37b) MMA
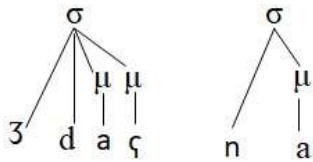
(38a) SA
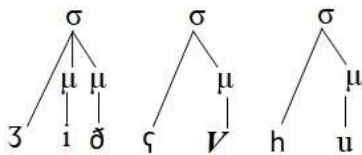
(38b) MMA
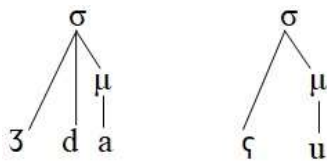
Observingly, the moraic weight is less in the MMA representations than the SA representations. The same is noticed in relation to the syllabic count. As for the syllabic type, MMA representations display complexity contrasting in this with the SA representations. On the other hand, (37b) shows that the mora of the pre final C has reassociated to the root-final pharyngeal fricative. In contrast, (38b) shows that the mora of the pharyngeal is deleted as this consonant is reassociated as an onset for the vocalic suffix 3Pers.Sing.Masc. That the mora count differs in a paradigm of a stem is a new finding that again distinguishes MMA. I do not know whether this is observed in other world languages. However, in MMA the mora count in a paradigm is less if the form is inflected with a vowel-initial suffix but it increases if the form is inflected with a consonant-initial suffix. I assume that the mora exists in all input representations. The difference is in the output representation as this mora does not find a segment to associate with because the final C of the monosyllabic stem is associating as onset not as coda.

I will not pursue the other patterns because in these patterns the base morpheme either exhibits vowel insertion or mainly the loss of case suffix. Hence, the base morphemes in the other patterns are either CVC*V*C or CVCC. Since the two processes; vowel insertion and case deletion, were already discussed separately there is no need to repeat discussing them in this section that is meant to focus on the shift CVCC→CCVC process.

5.5.3 Overall

Accordingly, due to the loss of case, Arabic nominal words have undergone change that affected the syllabic structure and the moraic structure of these words. This change was systematized to maintain the lexical similarity, basically, through moraic faithfulness and root-consonants faithfulness. I argue that phonology of the Arabic language operates in a way that reduces the effects of change lexically through three minimality conditions. These conditions are responsible in minimizing syllabic innovation, minimizing the loss of moraic weight of a stem and minimizing the change in the phonetic values of the root-consonants. I also argue, considering the contrast between Arabic and Hebrew, that the three minimality conditions are operated in the phonology of all Semitic languages.

That there is a minimality condition that is responsible on minimizing the loss of the moraic weight in Arabic is a conclusion formed because of the findings about the preservation of mora count through the moraic stability processes. On the other hand, there are several substantiations that demonstrate that there is a minimality condition that is responsible on minimizing syllabic innovation. Firstly is the amount of stability that was found in the number of syllables in the structures even though the lost segment is the one that forms a rhyme. Secondly is the type of syllables that are forming a structure. The Arabic dialects were found differing in terms of the degree of minimizing syllabic innovation whether in the number of syllables that is forming a structure or the type of syllables that are in the structure. Bearing in mind that the word 'innovation' is used here to indicate to innovation in contrast to stability in a structure, the meaning that I am trying to convey here is that the stability in the number of syllables and their types in a structure, whether it is a structure of a stem-form or inflected-form, demonstrates that the syllabic innovation is minimalized. This is measured through contrasting the structures of the classical era with their current decedents.

The focus now is on the minimality condition on the change of the phonetic values of root-consonants within Arabic variations. The effects of this minimality condition are very clear from the collected data as a whole. Even though the modern Arabic dialects and the

227

classical variations may surface different root-segment(s) but, generally, it is noticed that the surfaced phonetic value of the root-consonants are very similar. Even the MMA dialect, which was not easy to understand, I perceived the informants of this dialect as native Arabic speakers who articulate the same Arabic words that I know but within a too pressed articulation that was felt peculiar. Thus, MMA was hard to understand but in same time it was very familiar[31].

Therefore, I conclude that the three aforementioned minimality conditions in Arabic are responsible on systematizing the phonological change in this language to create grammars that are even though distinctive but remains very similar. I think this is what Broselow (1992: 7) might be intending in stating that:

> The dialects of Arabic provide an ideal testing ground for any theory of parametric variation, since most of the dialects are similar enough to provide a basis for meaningful comparison, but taken as a whole they exhibit a wide range of variation.

I would add to Broselow's words above that Semitic family provides 'an ideal testing ground' for any theory of change that is looking to investigate a slow-motion change. Since I assume that change is manufactured to be systematized in all world languages families and that the slow-motion change that has the goal to preserve similarity within long span is a

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[31] Reasoning around this perception that I have for this dialect, I think what makes it hard to understand is the duration of articulation of a word which was too short that gave me the impression that an articulation is too pressed. The second reason is that they have active Arabic vocabularies that are used for different meanings. In other words, the same articulation of a word but the meaning is different from what is common, (i.e., due presumably semantic change). Thirdly, I perceived major syntactic-morphological change in this dialect though I did not recognize other than (i) the loss of gender distinction in 2Pers.Sing which was very significant when discovered and (ii) expressing 2Pers.Sing is most often in this dialect expressed through an inflected functional word. One of the inflected-forms of this functional word was [dijaalik]. During the communication I heard different forms of this word several times in the speech but was meaningless for me and increased the burden to understand the speech. Later I was informed that [dijaalik] is an equivalent for the inflection 2Pers.Sing. The knowledge improved my understanding for the MMA speech but it did not reduce its peculiarity. On the other hand, what makes MMA is very familiar is that I perceive Arabic phonemic consonants formed within word-structures that I can recognize that they are Arabic word-structures. In other words, it is the lexical components and the syllabic formations what make MMA recognized very well as an Arabic variation. Nonetheless, the familiarity of the dialect improved the understanding, thus, whereas in the first hour, approximately, my inability to understand well what I am hearing was very clear for me, later I became more aware that my understanding was improving. Hence, I became more able to understand the speech of the MMA natives during our communication.

distinctive in the Semitic family, I think that a theory of change should starts by approaching the Semitic languages and then move to search for the goals of change in the other world languages families. I do not assume that the other world languages families are less distinctive from the Semitic family. Rather, I think that each world language family has been supplied with a change machinery that is manufactured to have goal(s) which determines the characteristics that distinguish the family from the other world families. I also think that each world family displays a unique idiosyncrasy of some kind. It was easy for me to recognize the idiosyncrasy of *remaining similar* in the Semitic languages partly because I am a native speaker of one of these languages and partly because of the documentations that are possessed about these languages. I think that there are linguists who for them it is easy to recognize the idiosyncrasy of other world languages even though, as far as I know, the other languages are not as documented as the Semitic languages. Nonetheless, the task that is waiting linguists is to find the goal in the language families and the characteristics so that the anticipations for the future of a language are built on scientific bases.

In the next section I propose an analysis that is intended to describe the conflict(s) between syllable well-formedness and moraic conservatism in Arabic through constraints ranking.

5.6. Suggesting an analysis

The analysis that is developed here has the goal of accounting for the argument that was introduced in the previous section, that is, syllable well-formedness is in conflict with moraic conservatism. Section 5.4 has argued in favour of a moraic approach and a stratal version of OT. Bermúdez-Otero's (1999) implementation of Hayes' moraic approach in Stratal OT is adopted. Thus, the real role that is expected from this section is to suggest constraints and rankings for these constraints to capture what were found and what is argued for. However, being realistic towards what I can accomplish theoretically, I only present here an *initial analysis* that needs to be revised be those who are interested to develop the research. I began by arguing that the change that resulted from the loss of the vocalic markers in Arabic is not a *blind* change. Rather, the change is dynamic. The dynamic forces are evident in establishing non-random directions of change. This is discussed in subsection 5.6.1. In subsection 5.6.2 three assumed variations in the classical era are recognized chronologically. Subsection 5.6.3 develops different constraint rankings for the investigated modern dialects. In subsection 5.6.4 the focus is on the issues that are not handled in the analysis and need to be addressed in future research.

5.6.1 The dynamic of change

I argue that the modern Arabic dialectal break up is a result of series changes. The evolution of the complexity in the syllabic margins which appear in some modern dialects contrasting with the variations of the classical era is a main phonological noted consequence. The other main consequence is that the moraic weight of a stem is stable even though the lost segment was a moraic segment. Yet, this stability for the moraic weight of a stem is not total nor it appears in the same extent in all dialects. Consider, for instance, IBA, which displays the highest rate of operating a moraic stability process, (i.e., vowel insertion) in all the levels of the grammar. Observantly, the collected data show that there are stems that lost a mora, (e.g., the three CVʔC stems). Hence, even IBA cannot be claimed that it has a total and complete moraic stability.

The analysis is focused on the evolution of the CVCC syllable type since it is the main direct result of the loss. The hypothesis of this study is essentially focused on CVCC. The discovery of the two other superheavy syllables accompanied the main results which were not overlooked because of their significance. Therefore, the superheavy syllables CCVC and CVVC, to some extent, are addressed as well in the analysis but I center the analysis on the syllable CVCC.

Based on the collected data, all the investigated modern dialects manifest a resistance for the CVCC syllable type in some level of their grammar. Some of them never allow the CVCC syllable type to surface in all three levels, (i.e., IBA). Moreover, all of them manifest moraic conservatism in some level of their grammar. Notably, these main outcomes can be explained by a set of constraints. I suggest in this section incorporating in the hierarchies the following constraints, (i.e., the *CVCC constraints family and a LEXICAL MORACONSERVATISM constraint). In the following subsections, some attention is devoted to these constraints.

5.6.1.1 LEXICAL MORACONSERVATISM

Since, the phenomenon of moraic conservatism has been shown to be a remarkable phenomenon in the phonology of all investigated Arabic dialects, I suggest implementing a constraint that expresses it in the hierarchy taking the following form.

LEXICAL MORACONSERVATISM (Lex μ)

Let nP be a potential novel phonological property in T word.
Let mora μ be a stranded μ of α lexical deleted segment in T.
If the stranded μ can prevent nP, then stranded μ is a mora that undergoes conservatism V^{μ}.

To explain Lex μ in the above formed equation, the following illustration is provided for the word *baħrV* "sea.case marker" of the classical era. The illustration shows that α, (i.e., lexical deleted segment in T word) is the vocalic marker V which is deleted. The nP, (i.e., a potential novel phonological property in T word) is the evolution of the superheavy syllable CVCC. Because the stranded mora μ of the vocalic marker, (i.e., α) can prevent the specified nP its mora undergoes conservatism $\cancel{V}^{\mu}$. The process that is used to conserve the mora in the word T, (i.e., *baħrV*) is epenthesis in KħA and IB; hence, surfacing *baħar* as a new structure for the word T. This illustration is outlined below:

Word T: $ba^{\mu}\hbar^{\mu}rV^{\mu}$

α: a lexical segment that gets deleted: V case marker

nP: innovative marked syllable type CVCC that violates SSP

μ: mora

$\cancel{V}^{\mu}$: the stranded mora of the deleted segment undergoes conservatism

The modern T: $ba^{\mu}\hbar a^{\mu}r^{\mu}$

In both dialects IBA and KħA a vowel insertion is operated to save the stranded mora of the deleted case marker. In IBA the motive is to prevent the CVCC syllable type from surfacing, whereas in KħA the motive is to prevent the violation of SSP. However, even though the two dialects do not share the same motive but each surfaces the same structure. Worth mentioning, Steriade (1999: 2) introduces the phenomenon Lexical conservatism and its effects in the avoidance of phonological innovation synchronically in English level 2 phonology and in French adjective liaison. She introduces Lexical conservatism as following:

> Lexical conservatism is the new proposal here: it is a class of grammatical conditions taking the form in (2) and promoting the use pre-existing, familiar expressions, or parts or properties of such expressions. They penalize the use of unprecedented, linguistically innovative expressions.
> (2)   Property P of a novel form of morpheme μ has a precedent in property P of a listed Form of μ.
> (Steriade, 1999: 2)

Steriade (1999) is involved in investigating 'the phonological mechanisms that signal lexical relations' to 'guide the interpretation'. She points out that:

> To indicate that a form is closely related to another, in semantic content or morphosyntactic function, speakers employ similarities of phonological shape.

[…]. Phonological similarity to a known form is used to guide the interpretation of the unfamiliar one.

(Steriade, 1999: 1)

In her examination of the English data, Steriade observes the stress assignment and the ability of some affixes to generate stress formations that ascertain that only 'stress profile' 'within the relevant lexical paradigm' is formed. Hence, the unprecedented stress profile would be avoided. Thus, her argument is focused on the properties of 'novel expressions' which are adopted from lexically related forms that belong to the same paradigm. Her argument takes a border context within the French adjectival liaison but essentially develops the same main argument. The lexical conservatism, therefore, explains the phonological similarities that are witnessed in a surface. However, as far as I understand Steriade (1999), what she is establishing by addressing the two phenomena, (i.e., stress assignment in English and adjectival liaison in French) is distinct from what I have established. The lexical conservatism in these two languages is more complex as the generated innovation form displays a lexical conservatism of 'property P of a listed Form of μ'. The symbol μ in Steriade's expression is used to donate a base morpheme (see: Steriade (1999) to understand more 'of a listed Form'). In Arabic, the word, diachronically, preserves its own 'property P', (e.g., its own moraic weight, its own syllabic structure, its own syllabic type and its own segmental component). Thus, based on the characteristics of lexical conservatism which Steriade (1999) explains, lexical conservatism in English and French is more array than that in Arabic. By array I mean that in these two languages the 'property P' that undergoes conservatism is not limited to one realization; rather, it is elected from 'a listed form'. The consequence of this is that, at long term, the phonological similarities in English and French are expected to be less significant which would result on minimizing signalizing the lexical relations between the words.

In contrast, consider the witnessed lexical moraic conservatism in Arabic, it is diachronic; hence, the moraic conservatism continued for a long span. In addition, it is highly limited as the property P is in one word, whether it was a stem-form or inflected-form. Hence, the mora count that is preserved in a stem-form is not elected from related words. Rather, it is the mora count of the same word. The long span of preservation/conservatism of property P that belongs to the same word explains the high phonological similarities in Arabic between (i) variations of the decedent words, (ii) the variations of the modern heirs and (iii) the decedent words and the modern heirs. It also explains the high similarities between the Semitic sister languages.

As far As Steriade (1999: 1) 'similarities of phonological shapes to a known form' is employed to 'guide the interpretation of the unfamiliar one'. Therefore, in English and French the unfamiliar form would be interpreted by relating it to the closest phonological shape of a known form. The phonological similarities in Arabic also motivate guiding the interpretation of words so that they remain predictable in terms of their semantic meaning. However, because in Arabic the phonological similarities remain through long period of time between the decedent words and their modern heirs the semantic interpretation is straightforwardly guided.

On the other hand, the high similarities yet distinctions between Arabic variations are acknowledged, (see: Broselow, 1992), but they are not justified scientifically in terms of how change is monitored in Arabic, as far as I know. The collected data in this study are extracted from sources that did not go under a standardization process which generally used as a linguistic excuse for the witnessed stability in Arabic or the slow motion of change. Thus, since the amount of resemblance between the data of the classical era and the data of the modern era is *striking* considering the period of time between them, I argue that the Arabic language change is fixed so that the resemblance remains signaling lexical relations. I also argue that this is a language-specific property that distinguishes Arabic language cross-linguistically not in terms of exclusivity but in terms of the extent that the internal system of Arabic language uses this property. Moreover, I argue that the proto-Semitic highly activates this property. Hence, the highly activation of this property in Arabic is inherited. I argue that the other Semitic sisters also inherited this property but I assume that not all of them activate it in the same degree. A significance of this property in Arabic is discussed in chapter six in section 6.6.

Nonetheless, as will be seen in the analysis, Lex μ is invisible in the rankings of the variations of CA, but visible and active in the dialects of the modern era. This is because in the classical era the case markers are not lost yet. In the classical era, the contrast in the analysis is in the phrase-level between the contextual forms and the pausal forms. This contrast will display mainly restrictions types for surfacing of case inflections. For example, the case markers phonetically can be processed with روم *Rawm* in the pausal position. The phonetic realization of (i) روم *Rawm* describes the realizations of the genitive /i/ and nominative /u/ as lacking their normal length when pausing. In addition, the nominative marker in the pausal position can be processed by إشمام *Ishmaam*, (i.e., rounding the libs but the nominative marker cannot be heard). The process of deleting the markers is also another restriction type of surfacing the case inflections in the pausal position. Therefore, the vocalic

markers as segments can be viewed as segments that are losing their phonetic features in the pausal position in the seventh century. Such loss of phonetic features is observed in MEOSL by Bermúdez-Otero (1999). Therefore, following Bermúdez-Otero's (1999) account for the deletion of the apocopated schwa in MEOSL, the constraint *EMPTYV, which requires that the output representations should not contain vowels lacking oral feature, is visible in the hierarchies of the classical variations. Since the vowels lack their phonetic features mainly when pausing then *EMPTYV will not affect the contextual forms and initial forms because the markers have their full features in these positions in the phrase-level.

As for the constraint Lex μ, it has to be operating in the constraint hierarchies of the four modern Arabic dialects, although its position in the ranking may differ according to how much each of the four Arabic dialects shows the lexical conservatism. There is a need here to explain the mission that Lex μ is doing in the hierarchies of the modern era considering that there is the constraint *EMPTYV. It should be observed that *EMPTYV cannot be visible in the hierarchies of the modern dialects anymore since we know that the vocalic markers are lost in the modern era. In other words, there are not vocalic markers that are lacking their phonetic features in the modern era. Therefore, one of the main important roles that Lex μ is doing is that it justifies the existence of a stranded mora underlyingly even though the segment which was associating with this mora is lost. By imposing Lex μ in the hierarchies of the modern dialects we will be expressing the phonological fact that even though the mora donor is lost long time ago yet its mora has undergone moraic conservatism. It should also be noted that Lex μ is different from the anti-epenthesis constraint DEP^{μ} as Lex μ is a more specialized type since it expresses a different type of affairs. To explain, DEP^{μ} requires that each μ in the input has a correspondent in the output and that μ is a positional μ-licenser. Therefore, that the stranded mora is conserved and was associated by an inserted vowel satisfies DEP^{μ}. For more clarification, it will not be irritated by the incorrect claim that we are inserting a mora for the inserted vowel. More about these constraints and others appear in 5.6.3.

5.6.1.2 The *CVCC constraints family

The *CVCC constraints family, which prohibits the superheavy syllable CVCC, is also proposed. This constraint family consists of the following constraints.

*CuCC: The superheavy CuCC syllabic type is prohibited.

*CaCC: The superheavy CaCC syllabic type is prohibited.

*CiCC: The superheavy CiCC syllabic type is prohibited.

The need to recognize a family of *CVCC is so that the ranking in classical era show the contrast between *CuCC on the one side, and on the other side *CaCC and *CiCC in terms that the syllable CuCC is the first type that was avoided through the process u-insertion. In the modern hierarchies, the need for the constraint *CVCC is to express how much a modern dialect is accommodating the superheavy syllable CVCC.

Worth mentioning, the constraints *COMPLEX, which prohibits complex in margins, and *COMPLEXCODA, which requires that codas are simple, can presumably capture the processes of the syllable simplification. However, these constraints will be abounded, because they will not capture a main argument, that is, the loss of case inflections has led to the evolution of the syllable type CVCC in Arabic.

5.6.2 The variations of Classical Arabic

What needs to be accounted for here is that in the 7th century, the Arabic language had *variations*. There is a variation that allowed all types of CVCCs to surface in contrast to a variation that puts restriction on CuCC but allows CiCC and CaCC in the surface with no restriction. These variations do not only divide over the CuCC, CiCC and CaCC; rather, they exhibit differences in relation to the following syllable types CVʔC and CVCʔ. In that, there is a variation that allows these two syllables to surface, and there is a variation that employs the processes of ʔ-deletion and compensatory lengthening that follows this deletion. The ranking should capture that when underlyingly the final–CC consists of ʔ, the process of compensatory lengthening is provoked as this glottal stop is deleted and the preceding vowel is lengthened if it was -ʔC. On the other hand, if the final-CC was -Cʔ, the deletion of the glottal stop leads to lengthening the preceding consonant. However, in contrast to the vocalic lengthening, the consonantal lengthening is optional. Finally, we need to account for the 8th century case-metathesis as another resolution process that bans the realization of CVCC syllable type. All these need to be captured in the phrase-level as pausal forms typically occur at the end of a phrase. However, it should be noticed that I did not trace specific variation when collecting the classical data. Therefore, whereas I know for sure the existence of variations, the main phenomena in these variations and the realizations of these variations but I do not know them in terms of their full components. Therefore, my goal next is to form three assumed full variations. The constraints in hierarchies are proposed based on these assumed full variations.

Forming a full variation is based on the conclusions that were withdrawn from the collected data, in particular those that are related to the pausal forms. Therefore, I assume that

there are at least two variations in the seventh century. The first is Variation 1, which its main characteristic is that it surfaces CVCC in the pausal position unrestrictedly. I assume that the glottal stop is still phonemic in this variation, thus, the underlying /ʔ/ in CVCʔ and CVʔC surfaces. The innovation of CVVC syllable type is recognized in Variation 1 because as far as it is known both CVVC and CVCC were syllables that are conditioned to the pausal position in the classical era. The existence of Variation 1 is substantiated by the collected data, the old Arabic sources in general and by the practice of SA, (i.e., the more common classical variation).

Forming the second assumed variation, (i.e., Variation 2) was done by overgeneralizing and disregarding observations. The overgeneralizing is done for the role of avoiding SSP violation in provoking u-insertion in CuCC stems. As far as the collected data, even though the role of SSP in avoiding CuCC is conclusive but the extent of this role is overlooked. Therefore, I assume that the grammar of Variation 2 is highly sensitive for SSP violation in mainly CuCC. The u-insertion is *mainly* provoked if there is a potential for SSP. Hence, I disregard the data that show that CuCC itself was resolved even if it does not have a potential of SSP violation. I also disregard that there is root-vowel substitution, i-insertion and a-insertion. In relation to the realization of the glottal stops in CVCʔ and CVʔC in Variation 2, I assume that the glottal stop undergoes deletion and that its deletion is compensated through lengthening of a preceding segment. In Variation 2, the CVʔC stems surface as CVVC whereas CVCʔ stems surface as either CVC_iC_i or CVC. Hence, when the underlying /ʔ/ is moraic the preceding vowel gets lengthened when deleting /ʔ/ but when /ʔ/ does not contribute to the moraic weight the deleted glottal stop either compensated by lengthening the preceding consonant or not. Thus, in Variation 2 there are two realizations for CVCʔ stems.

Variation 1 and Variation 2 are assumed to exist in the seventh and eight centuries. There is, however, a third variation, (i.e., Variation 3) that is assumed to exist in mainly the eighth century. This variation operates the case-metathesis resolution in addition to the vowel insertion. I assume that in this variation all CuCC and CiCC stems are resolved through u-insertion, i-insertion or case-metathesis. In contrast, CaCC is not resolved in this variation. The existence of a potential to violate SSP is not of importance in this variation. Rather, the significance in this variation is the CVCC syllable type. That all CuCCs are resolved, whether there is a potential of SSP violation or not, is based on Yuunis's generalization about this type of stem. That all CiCC are resolved is overgeneralizing since what I really know is mainly that there is a resolution for CiCC by GEN-metathesis. This

knowledge is because, as mentioned before, it is documented in Sibawaih's book. In Variation 3, CVʔC stems surface as CVVC and CVCʔ surface as either CVC or CVCᵢCᵢ. Thus, I assume that the sound change that is affecting the phonemic state of the glottal stop is constant. Bearing in mind that in the eight century Sibawaih documents that the glottal stop in CVCʔ and CVʔC surfaces in the languages of some Arabs, and that there is other resolution for CVCC, thus, I am disregarding other variations in this century. In addition, the contextual-forms in that era are disregarded.

Therefore, in short the following assumed variations are the ones that I propose analysis for:

    Variation 1: all CVCC surfaces in a pausal position. No process is provoked to avoid any of them.

    Variation 2: CuCC is avoided only if final –CC violates SSP through the insertion of mainly /u/. CVʔC surfaces as CVVC and CVCʔ surfaces as either CVC or CVCᵢCᵢ.

    Variation 3: CuCC and CiCC are avoided through the insertion of /u/ and case-metathesis. CVʔC surfaces as CVVC and CVCʔ surfaces as either CVC or CVCᵢCᵢ.

The aim next is to come up with some main constraints that are assumed to be visible in the ranking.

    To account for the deletion of the vocalic case marker in pausal position in the three variations, I adopt two rankings from Bermúdez-Otero's (1999: 231) which he suggested for the stem-final –ə deletion in MEOSL, (i.e., *EMPTYV>>MAX^Seg and WEAKC>> PARSE^Seg).

    Starting with the ranking *EMPTYV>>MAX^Seg, this ranking allows the deletion of the vocalic marker if it lacks its phonetic features in pausal position. Even though Arabic is known for its preservation for the segmental components in general, which means that the anti-deletion constraint is high ranked in Arabic, but because of the deletion of the case vocalic marker in pausal position I assume that the anti-deletion constraint is dominated by *EMPTYV. The constraint *EMPTYV has to be satisfied with the expanse of a penalty from MAX^Seg because its satisfaction enables the grammatical candidate to win as can be seen in tableau 5.1 below. In tableau 5.2, the ranking MAX^Seg>>*EMPTYV shows that the grammatical candidate does not win because the ranking is MAX^Seg>>*EMPTYV.

/ʕuᵘðᵘr-Vᵘ/pausal-form	*EMPTYV	MAX^Seg
a.[ω[σʕuᵘᵘ]r]		**
b. [ω[σʕuᵘðᵘrVᵘ]]	*	
c. [ω[σʕuᵘðᵘ]r] ☞		*

Tableau 5.1

/ʕu^{μ}ð^{μ}r-V^μ/pausal-form	MAX^{Seg}	*EMPTYV
a.[$_ω$[$_σ$ʕu^{μμ}]r]	**	
b. [$_ω$[$_σ$ʕu^{μ}ð^{μ}rV^μ]] ☞		*
c. [$_ω$[$_σ$ʕu^{μ}ð^μ]r]	*	

Tableau 5.2

In Tableau 5.1 the grammatical candidate in (c.) wins because it has mainly one penalty from the low ranked MAX^{seg}. The candidate in (a.) losses because the number of penalties that is assigned from MAX^{seg} in contrast to the winner. As for the candidate (b.) it loses because it has a fatal violation from the high ranked *EMPTYV. Reversing the ranking to MAX^{Seg}>>*EMPTYV results on winning the less optimal candidate (b.) as can be seen from tableau 5.2. The grammatical candidate (c.) losses because the one penalty that is being assigned to is from the high ranked MAX^{Seg}. Therefore, the ranking *EMPTYV>> MAX^{Seg} is the assumed in the hierarchy of each of the three classical variations.

The ranking WEAKC>>PARSE^{Seg} is needed to grant an extrasyllabic position for a preceding consonant which becomes word-final due to the deletion of the vocalic marker in Variation 1. The constraint WEAKC, according to Bermúdez-Otero (1999), demands the extrasyllabicity of only one consonant, whereas PARSE^{Seg} requires that every segment must be dominated either by a mora node or by a syllable node. As can be seen in tableau 5.3 below, in Variation 1 the winner is the grammatical complex candidate in (b.). This is because in Variation 1 there is no u-insertion and the extrasyllabicity of one consonant is a requirement. Hence, simplifying the structure by inserting a round vowel is assigned a fatal penalty from the high ranked WEAKC as the insertion process bans the extrasyllabicity.

/ʕu^{μ}ð^{μ}r-V^μ/pausal-form	WEAKC	PARSE^{Seg}
a.[$_ω$[$_σ$ʕu^μ][ðu^{μ}r^μ]	!*	
b. [$_ω$[$_σ$ʕu^{μ}ð^μ]r] ☞		*

Tableau 5.3

On the other hand, because in Variation 2 and Variation 3 the extrasyllabicity is resolved through either i-insertion, u-insertion, NOM-metathesis or GEN-metathesis the ranking will show that WEAKC is dominated by PARSE^{Seg}. Observingly; however, even though final extrasyllabicity is resolved in these two variations but this resolution is not a total resolution. In Variation 2 the extrasyllabicity is resolved mainly in CuCCs whereas in Variation 3 it is resolved mainly in CuCCs and CiCCs. Thus, the analysis must account for the grammaticality of the candidates that surface the one extrametrical consonant in CaCCs and CiCCs in Variation 2 and in mainly CaCC in Variation 3. The very specific WEAKC^{CaCC}

is substituting the more general WEAKC in the hierarchy of Variation 3. In the hierarchy of Variation 2 the more general WEAKC is substituted with the specific WEAKC$^{CaCC+CiCC}$. Hence, the ranking in Variation 1 is WEAKC>>PARSE^{Seg}, in Variation 2 it is {WEAKC^{CaCC}+^{CiCC}}>>PARSE^{Seg} and in Variation 3 it is WEAKC^{CaCC}>> PARSE^{Seg}.

Wiltshire (1999: 144) reintroduces *$\sigma_{\mu\mu\mu}$ which demands that 'Syllables are maximally bimoraic' as $\sigma\leq 2\mu$ which demands that 'Syllables do not exceed two moras'. I adopt Wiltshire reformulation and recognize $\sigma\leq 2\mu$ in the hierarchy of the Arabic language. The constraint $\sigma\leq 2\mu$ is undominated in the hierarchy of each variation to grant the Bimoraicity maximal condition. As will be seen later, this constraint is undominated even in the hierarchies of the modern Arabic dialects.

The ranking between WEAKC and *CVCC is presumed to be WEAKC>>*CVCC in Variation 1. The justification for this domination for WEAKC over *CVCC appears in Tableau 5.5 below in which WEAKC favours the winner over the loser candidate. The different between the two outputs is that the loser (a.) is syllabifying the final C into the rhyme of the same syllable whereas the winner is syllabifying it as an extrametrical. Hence, in (b.) the final C is associated to the ω node without a meditation. Observe that the winner and the loser candidates tie in *CVCC as each is assigned a penalty from this constraint. It is the constraint WEAKC which penalizes the losers with a fatal penalty. Therefore, the ranking WEAKC>>*CVCC in Variation 1 gives the grammatical account.

/ʕu$^{\mu}$ð$^{\mu}$r-V$^{\mu}$/pausal-form	WEAKC	*CVCC
a.[$_{\omega}$[$_{\sigma}$ʕu$^{\mu}$ð$^{\mu}$r]]	!*	*
b.[$_{\omega}$[$_{\sigma}$ʕu$^{\mu}$ð$^{\mu}$]r] ☞		*

    Tableau 5.4

Accordingly, for Variation 1, the suggested ranking should capture that the novel syllable type CVCC has been accommodated in the pausal position of phrase-level even if that costs a violation for SSP. This will make us conclude that the members of the *CVCC constraints family are low raked in this variation. Moreover, SONSEQ which prohibits CC from violating SSP in the constraints hierarchy of this variety is invisible. The set of constraints that is assumed for Variation 1 can be seen in tableau 5.5.

/ʕuᵘðᵘr-Vᵘ/pausal-form	σ≤2μ	*[σCC	*EMPTYV	MAXˢᵉᵍ		WEAKC	*CVCC	PARSEˢᵉᵍ
a.[ω[σʕuᵘðᵘ[σr-Vᵘ]]]			!*			*		
b.[ω[σʕuᵘ][σ ðᵘuᵘr]]				!*		*		
c.[ω[σʕuᵘðᵘrᵘ]]	!*			*		*	*	
d.[ω[σʕuᵘᵘðᵘ]r]	!*			*				*
e.[ω[σʕuᵘᵘ]r]				!**				*
f.[ω[σʕðuᵘrᵘ]]		!*		*		*		
g.[ω[σʕuᵘðᵘ]r] ☞				*			*	*

Tableau 5.5

In tableau 5.5 the candidate in (f.) loses since it violates the undominated constraint *[σCC which requires that onset comprises no more than one segment. There is no evidence that suggests that WEAKC is dominated by the other higher constraints or not, thus, I place it and the constraints that it is dominating to the right to express 'Ranking disjunction' (see McCarthy, 2008: 85). Note that since we are dealing in the phrase-level, the input has the information regarding the location of the word when surface in the phrase. Another worth mentioning note is that the ranking above does not require that we make changes for the inputs that consist of a glottal stop in the final-CC because in Variation 1 the glottal stop is still acting like other phonemic consonants. Hence, in this variation it does not undergo deletion and compensatory lengthening.

The Variation 2 is a variation that has the following manifestations. Firstly, CuCC realization is avoided only if the final –CC violates SSP through the insertion of mainly /u/. Secondly, CVʔC stems surface as CVVC. Thirdly, CVCʔ stems surface as either CVC or CVC$_i$C$_i$.

Accordingly, for the Variation 2, the ranking differs to some extent because more constraints in the hierarchy are imposed to account for the new realizations. Since we need to show that only those of CuCCs that do not violate SSP are permitted to surface, we will need a member of SONSEQ. This member is SONSEQ^{CuCC} which is visible in this variation and dominates *CVCC. Such domination is argued to be sufficient for all types of CuCCs, as SONSEQ^{CuCC} will be sifting them. Consequently, the floating mora of the deleted vocalic suffix in the input /ʕuᵘðᵘr-ᵘ/pausal form "excuse" gets associated with an inserted round vowel that had the mission of satisfying SONSEQ^{CuCC}. In contrast, inputs without a potential of violating SSP their floated mora gets lost. For instance, /muᵘlᵘk-Vᵘ/pausal form "dominion" will have [ω[σmuᵘlᵘ]k] as a winner without reassociation for case's mora. Therefore, this type of CuCC

escapes the sifting of SONSEQ^{CuCC}. In addition, the syllables CaCC and CiCC escape SONSEQ^{CuCC} as this constraint is targeting only CuCCs. Thus, until now, the ranking consists that is assumed for Variation 2 contains the following main constraints:

{σ≤ 2μ, *[$_σ$CC, *EMPTYV}>> SONSEQ^{CuCC}, WEAKC^{CaCC}+^{CiCC}>>*CVCC, PARSE^{Seg}

As can be seen the ranking {WEAKC^{CaCC}+^{CiCC}}>>*CVCC, PARSE^{Seg} is substituting WEAKC>>CVCC, PARSE^{Seg} in the hierarchy of Variation 1. As mentioned before, the more specific constraints in the hierarchy of Variation 2 is to account for the limitation in permitting extrasyllabicity. Consider the candidates in tableau 5.6 and 5.7 below:

/ʕu^{μ}ð^{μ}r-V^μ/pausal-form	WEAKC$^{CaCC+CiCC}$	*CVCC	PARSE^{Seg}
a.[$_ω$[$_σ$ʕu^{μ}ð^{μ}r]]	!*		
b.[$_ω$[$_σ$ʕu^{μ}ð^μ]r]	!*		*
c. [$_ω$[$_σ$ʕu^μ][ð$\boldsymbol{u}^μ$r^μ]] ☞		*	

     Tableau 5.6

The winner candidate (c.) is winning because it is not penalized by WEAKC$^{CaCC+CiCC}$. This constraint did not give penalty for the candidate (c.) because the input is of the type CuCCs not CaCCs or CiCCs. Hence, there is no demand that is imposed for extrasyllabicity. In contrast, the candidate (c.) in tableau 5.7 loses because this candidate display u-insertion that syllabifies the final C of a CaCC stem type as a weight-contributing coda not as an extrasyllabic consonant that is associated to the ω node. As for candidate (a.) in tableau 5.7 it loses because the final C is associated as a weightless coda not as an extrametrical consonant. The constraint WEAKC$^{CaCC+CiCC}$ demands extrasyllabicity for CaCCs and CiCCs stems. Thus, its penalties depend on the stem that is in the input.

/na^{μ}f^{μ}s-V^μ/pausal-form	WEAKC$^{CaCC+CiCC}$	*CVCC	PARSE^{Seg}
a.[$_ω$[$_σ$na^{μ}f^{μ}s]]	!*		
b.[$_ω$[$_σ$na^{μ}f^μ]s] ☞			*
c. [$_ω$[$_σ$na^μ][f$\boldsymbol{u}^μ$s^μ]]	!*	*	

     Tableau 5.7

Moreover, in Variation 2 we need to make considerations for the final consonantal sequence of -ʔC and -Cʔ. To account for the deletion of ʔ I suggest implementing the constraint *GLOTTAL in the ranking similar to Hannahs (2013: 107). *GLOTTAL is a constraint that requires that glottal consonants are prohibited. However, in Hannahs' analysis the constraint *GLOTTAL seems capturing the phonological status of glottal segments in Welsh, it needs to be modified a little bit so that it can account for the Arabic data without an overgeneralization in its application. Hence, I propose *GLOTTAL$^?$ which is specialized with the prohibition of mainly the glottal stop. Because CVCʔ surface as either CVC or CVC$_i$C$_i$ I assume that *GLOTTAL$^?$ is ranked over {WEAKC^{CaCC}+^{CiCC}}>>*CVCC, PARSE^{Seg}.

The ranking above needs to be modified in order to accommodate the new processes that appears in the 8th century, (i.e., NOM-metathesis and GEN-metathesis). Thus, to account for this new distinctive in Variation 3 again I follow Hannahs' (2013: 99-100) analysis for Welsh in introducing the constraint LINEARITY is the hierarchy. This constraint requires that the sequential ordering segments in the input must be reflected in the output. However, again I modify the general constraint to LINEARITY^{ACC} which demands the sequential ordering of the accusative suffix. Hence, rearranging the sequential order of nominative and genitive suffixes escapes the penalty of this constraint which is assumed to be undominated in Variation 3 because according to the documentation no ACC-metathesis was observed. I propose the following hierarchy for Variation 3:

{σ≤ 2μ, *[$_σ$CC, *EMPTYV, LINEARITY^{ACC}}>> SONSEQ^{CuCC}, *GLOTTAL$^?$, WEAKC^{CiCC}>>*CVCC, PARSE^{Seg}

Overall, the previous analysis is a preliminary proposal and needs modifications from future research. The Sibawaih's documentation talks about more phenomena, (e.g., the lengthening of the case markers instead of deleting them). Therefore, the analysis can be developed to account for them. In addition, attention should be altered that the analysis does not account for the lengthening of the accusative marker that follows deleting the nasal that marks the indefinites which I know that it exists in Variation 1. This lengthening is to protect the mora of the deleted nasal as the nasal suffix is associated as a weight-contributing coda. For illustration, the structure CV^{μ}C^{μ}C-a^μ-n^μ surfaces in the pausal position as CV^{μ}C^{μ}C-a^{μ}a^μ not as CV^{μ}C^{μ}C. Hence, the proposed analysis for the Variation 1 has a default. The extrametricality is not always permitted which mean that WEAKC is either dominated by some constraint that account for the disallowances of extrametricality in indefinites nominal words or it has to be specified.

5.6.3 The dialects of modern Arabic

The focus here is on the modern grammars of the investigated dialects. The investigation showed that we have four different grammars. Each of the Arabic sister dialect has its own constraint hierarchy. It is true that they display high similarity but it is also true that they are distinct from each other. Here an analysis for each dialect is proposed to account for the generalizations that distinguish the dialect. As has been established previously, all the dialects manifested, in different degrees, a resolution for CVCC and conservatism for the mora of the lost vocalic markers. Moreover, the contrast between moraic conservatism of the root-consonant ʔ and the moraic conservatism of the vocalic marker needs to be recognized in the suggested analysis.

Due to the nature of the collected data and the confines of the proposed strata, the focus will be mainly on the stem-level and word-level. As for conclusions that were made regarding the phrase-level of KħA and ECA, no account will be proposed for them because these conclusions were formed on very few amount of data, (i.e., mainly two sentences from each dialect). I also need to bring the attention that the proposed hierarchy for MMA needs to be amended by collecting more data due to the extent of complexity which the current data exhibit. Accordingly, five headings appear in this section, (i.e., IBA dialect, KħA dialect, ECA dialect, MMA dialect and overall).

5.6.3.1 IBA dialect

This dialect in particular has showed high restriction for the CVCC syllable type in both stem-level and word-level. In addition, the floated mora of the lost vocalic markers through operating the vowel epenthesis is saved in both levels. Generally, in the stem-level the floated mora is preserved through vowel insertion whereas in the word-level it is preserved through either a morphological supplement of a vocalic suffix or through operating the vowel insertion. The constraints $\sigma \leq 2\mu$ and $*[_\sigma CC$ are undominated in this modern dialect. Hence, in IBA syllables do not exceed two morae and complexity word-initially is also prohibited. Because the syllable CVCC is not accommodated in both stem-level and word-level *CVCC is undominated constrained in IBA in both levels. Nonetheless, observe that I am here overlooking the one realization of CVCC in the collected data which is assumed to be borrowed from SA. The tableau 5.8 presents some main constraints for IBA which are assumed to be in the hierarchy of the stem-level. The nominal example that is in the tableau is /ʃiʕr/ "poetry". The boldfaced floating mora in the input is the case's stranded mora which has undergone conservatism.

/ʃiᵘʕᵘr-ᵘ/	σ≤ 2μ	*[σCC	*CVCC	Lex μ	MAXᵘ	DEPᵛᵒʷᵉˡ
a.[ω[σʃiᵘʕᵘ]r]			!*	*	*	
b.[ω[σʃiᵘʕᵘrᵘ]]	!*		*			
c.[ω[σʃiᵘᵘʕᵘ]r]	!*		*			
d.[ω[σʃiᵘ]r]				*	**	
e.[ω[σʃiᵘʕᵘ]]					*	
f.[ω[σʕiᵘrᵘ]]		!*		*	*	
g.[ω[σʃiᵘ][σʕiᵘrᵘ]] ☞						*

Tableau stem-level 5.8

As can be seen, *CVCC is a high ranked constraint in this dialect. Since technically the mechanism that is used to prevent the syllable CVCC from surfacing is vowel insertion the constraint DEPᵛᵒʷᵉˡ is low ranked in the hierarchy. DEPᵛᵒʷᵉˡ has to be ranked low so that Lex μ can be satisfied through the stabilization process, (i.e., the insertion of a vowel). As mentioned before, Lex μ requires that the stranded mora of the lost segments to undergo conservatism if this process will prevent innovation. The inserted vowel will receive a penalty from DEPᵛᵒʷᵉˡ but the expense of this penalty is of worth as because of it the grammatical candidate wins. This winning is because the inserted vowel becomes associated with the stranded mora of the lost case. Since this association prevents the innovation of the syllable CVCC the winner candidate (g.) satisfies Lex μ.

There is a need to distinguish between Lex μ and MAXᵘ. The role of each constraint differs from the other as MAXᵘ requires that each mora in the input has a correspondent in the output. Hence, the center role of MAXᵘ in the analysis would be ensuring that the mora count of the input equals the mora count of the output. In contrast, Lex μ is a special constraint that cares about the morae of lost segments. Hence, Lex μ is blinds except for a stranded mora that is in the input is left unassociated. Consider the two candidates (d) and (f) in tableau 5.8, we can see that the deletion for the stranded mora of case leads to a penalty from both constraints Lex μ and MAXᵘ, but if the output displays the deletion of a mora that is not a stranded mora in the input a penalty is assigned mainly from MAXᵘ.

Another constraint that has to be visible in the hierarchy is the constraint *GLOTTALˀ, which is specialized with the prohibition of mainly the glottal stop (see: tableau 5.9 below). As mentioned before, the glottal stop in this dialect, as far as the collected data, is prohibited in CVʔC and CVCʔ[32].

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[32] One of CVCʔ has a realization that displays surfacing the glottal stop. This realization is assumed to be borrowed from SA.

On the other hand, because this dialect restricts extrasyllabicity except if the stem-form was CVVC the constraint WEAKC$^{\text{CVVC}}$, which demands the extrasyllabicity of only one consonant in CVVC stems, is visible in the hierarchy of the stem-level. The specification of the general WEAKC to WEAKC$^{\text{CVVC}}$, and ranking it over PARSE$^{\text{Seg}}$ accounts for the only position in which the extrasyllabicity is allowed in this dialect. As can be seen in tableau 5.9 below, even though the candidate (b.) has final extrasyllabic C but it wins. The candidate (a.) loses because it is assigned a fatal penalty from the high ranked *GLOTTAL$^{\text{?}}$ whereas the candidate (c.) loses because it does not satisfy WEAKC$^{\text{CVVC}}$. The example in tableau 5.9 is /ra?s/ "head".

/ra$^{\mu}$?$^{\mu}$s-$^{\mu}$/	*GLOTTAL$^{\text{?}}$	WEAKC$^{\text{CVVC}}$	PARSE$^{\text{Seg}}$	DEP$^{\text{vowel}}$
a.[$_{\omega}$[$_{\sigma}$ra$^{\mu}$][$_{\sigma}$?$\boldsymbol{u}^{\mu}$s$^{\boldsymbol{\mu}}$]]	!*			*
b.[$_{\omega}$[$_{\sigma}$ra$^{\mu\mu}$]s] ☞			*	
c.[$_{\omega}$[$_{\sigma}$ra$^{\mu\mu}$s]]		!*		

Tableau stem-level 5.9

The proposed constraint hierarchy in the stem-level is:

{σ≤ 2μ; *[$_{\sigma}$CC; *CVCC; Lex μ; MAX$^{\mu}$}>> *GLOTTAL$^{\text{?}}$>> WEAKC$^{\text{CVVC}}$ >> PARSE$^{\text{Seg}}$ >>DEP$^{\text{vowel}}$

In the word-level, we need to describe mechanically that the epenthesis is either operated or blocked but the stranded mora of case is conserved in the operating and the blocking. Whenever morphologically supplies a vowel-initial pronominal suffix to the base the vowel epenthesis is blocked and if such suppliant is not provided the inserted vowel realizes. Hence, the domain in which the epenthesis is operating is smaller in the word-level than the stem-level. In the stem-level the exclusion for epenthesis is restricted to when the input consists of a final geminate, a glottal stop and to some extant a glide. Hence, in the stem-level the vowel insertion is also blocked. Yet, the few data that contains these consonantal segments in the collected data do not help in forming an accurate generalization about what determines the blocking in the stem-level. On contrary, in the word-level the generalization about what determines the blocking for the vowel insertion is already formed.

In the word-level the satisfaction of Lex μ and *CVCC relies on the morphology just as phonology. Therefore, I propose the same ranking of the stem-level but one constraint is claimed to play conclusive role to account for the systematic operating and blocking for the vowel insertion in this lower level. I will call this constraint No [eV] and specify the demand that it imposes to the prohibition of realizing an epenthetic vowel in a light syllable. This constraint has to outrank MAX$^{\text{vowel}}$ and MAX$^{\mu}$ but not Lex μ so that the winner candidate gets

selected as can be seen in tableau 5.10. The example in this tableau is /ʃiᵘʕ*i*ᵘrᵘ+aᵘk/ "poetry.2Pers.Sing.Masc". As has been illustrated before, the moraic underlying structure of the suffix /-aᵘk/ has mainly one mora though it is a rhyme suffix type and Arabic does not permit light VC rhymes. The explanation that was given to illustrate this unique underlying rhyme is that diachronically it was the syllable [-ka] as far as the standard variation of the classical era. Hence, the velar [k] was an onset but due to the segmental reorganizing it became a weightless coda in the input. Because Arabic does not permit light CVC to surface the weightless coda is linked to the mora of the lost case. This linking saved the stranded mora and prevented a light CVC from surfacing. Therefore, the candidate (c.) loses not because of being assigned with a violation from the high ranked Lex μ. Rather; the fatal penalty for candidate (c.) was assigned to it from another undominated constraint in Arabic. This constraint demands that heavy syllables minimally have two morae. I searched to find if someone proposed a name for this demand but I did not find. Hence, I propose the name: $\sigma_{\mu\mu}$ =2μ .

/ʃiᵘʕ*i*ᵘrᵘ+aᵘk/	$\sigma_{\mu\mu}$=2μ	Lex μ	No [eV]	MAXᵘ	MAXᵛᵒʷᵉˡ
a.[_ω[_ᵩʃiᵘʕᵘ][_σraᵘkᵘ] ☞					*
b.[_ω[_ᵩʃiᵘ][_σʕ*i*ᵘ][_σraᵘkᵘ]]			!*		
c.[_ω[_ᵩʃiᵘʕᵘ][_σraᵘk]	!*	*		*	*

Tableau word-level 5.10

The constraint No [eV] assigns a fatal violation to the output (b.) in tableau 5.10 because the epenthetic vowel is inserted in a light syllable. As can be seen, the characteristic of levels segregation which is offered by stratal OT captures what both phonology and morphology are doing. To explain, the issue is not only about saving the stranded mora; rather, it is about when, which and how each is actually saving the stranded mora. Morphology saves the stranded mora each time it supplies vowel-initial suffix whereas it is phonology that saves the stranded mora if the morphological supplement was consonant-initial suffix. Hence, in the word-level the vowel insertion is still operating but it is systematically blocked each time morphology supplies vowel-initial suffix. Structurally, it is observed that if the vowel insertion operated in an inflected-form that is formed by inflecting a base with a vowel-initial suffix then the epenthetic vowel surfaces in a light syllable. Thus, No [eV] in the hierarchy of the word-level account for the prohibition of the epenthetic in light syllables, (contrast the data in tableau 5.10 with those that appear in tableau 5.11). The example in 5.11 is /ʃiᵘʕ*i*ᵘrᵘ+haᵘ/ "poetry.3Pers.Sing.Fem".

/ʃi$^\mu$ʕ*i*$^\mu$r$^\mu$+ha$^\mu$/	Lex μ	No [eV]	MAX^{vowel}
a.[$_\omega$[$_\alpha$ʃi$^\mu$][$_\sigma$ʕ*i*$^\mu$r$^\mu$][$_\sigma$ha$^\mu$]] ☞			
b.[$_\omega$[$_\alpha$ʃi$^\mu$ʕ$^\mu$][$_\sigma$r*i*$^\mu$][ha$^\mu$]]		*	

Tableau word-level 5.11

Observe in tableau 5.10 that the anti-deletion constraint MAX^{vowel} assigns a violation for not surfacing the boldfaced inserted vowel which is in the input of the word-level domain. As known, in Stratal OT the input of the word-level is the output of the stem-level. The faithfulness constraint MAX^{vowel} demands faithfulness to the vowels of the input; hence, it penalizes every deletion for a vowel of the input. Thus, MAX^{vowel} is blind for the epenthetic state of the boldfaced vowel but it is not blind on its state of being a component of the input. On the other hand, since in the word-level the vowel insertion is operated unless the epenthetic vowel is going to surface in a light syllable. To ensure the operating and the blocking of the vowel insertion in the word-level the constraint No [eV] is ranked over MAX^{vowel}. I assume this; the epenthetic vowel that is inserted in the stem-level is deleted whether there is an operating or blocking for the vowel insertion in the word-level. This deletion is followed with another insertion process that inserts that same vowel of the stem-level in terms of quantity and quality. The operating of the insertion process satisfies MAX^{vowel} because the output is going to be faithful to the input in terms of its vocalic segments. Thus, both outputs the winner (a.) and the loser (b.) in tableau 5.11 satisfy MAX^{vowel}. In contrast, the blocking of the insertion vowel leads to a penalty from MAX^{vowel} as the output is less faithful to the vocalic segmental component of the input. This can be seen in tableau 5.10 which shows the candidates (a.) and (c.) being assigned a violation from MAX^{vowel}. Nonetheless, the penalty from MAX^{vowel} does not prevent grammatical candidates from winning as long as No [eV] is satisfied.

On the other hand, since the vowel insertion process may not be operated in the stem-level I assume that No [eV] is visible in the hierarchy of the stem-level. However, the shortage in data requires caution in terms of proposing its ranking in the hierarchy of the stem-level. A worth mentioning point is that even though we are dealing with a vowel insertion process that is diachronically resulted due to the loss of the case inflections but when being represented within Stratal OT it is represented as two operating processes. This is partially because of the characteristics that are displayed in the distinctive layers, (i.e., stem layer and word layer) by the vowel insertion. However, it is also because Stratal OT does not permit to access the epenthetic state of the vowels that are inserted in other layers.

As for the proposed constraint No [eV], it is a modification for the constraint No [i] which demands that '/i/ is not allowed in light syllables' (Kager, 1999a: 284). Kager (1999a) uses this constraint to account for metrical opacity in Palestinian Arabic that is related epenthetic vowels in relation to stress. Kiparsky (2000) adopts from Kager (1999) No [i] in a stratification account that is meant to counter Kager's (1999) output/output constraints.

Accordingly, the constraints hierarchy for the word-level in IBA proposed to be:

$\{\sigma \leq 2\mu; \sigma_{\mu\mu} = 2\mu; *[_\sigma CC; *CVCC; Lex \mu; MAX^\mu\} >> No [eV], *GLOTTAL^? >> WEAKC^{CVVC} >> PARSE^{Seg} >> \{DEP^{vowel}; MAX^{vowel}\}$

5.6.3.2 KħA dialect

Contrary to IBA, KħA is a dialect that has accommodated the superheavy CVCC syllable very well as it allows it to surface in all the levels of its grammar. Yet, a restriction is made that shows that in a very small domain KħA still preserve some resistance for CVCC and that the stranded mora of the lost moraic vowel is still there functioning phonologically. This small domain involves the final consonantal sequencing that has a potential of violating SSP. Therefore, the function of the stranded mora can be summarized in satisfying the high ranked SONSEQ without violating the undominated DEP$^\mu$. Accordingly, *CVCC will be dominated in this dialect by SONSEQ. Such ranking; however, overlooks the few CVCC realizations that even though violating the undominated SONSEQ but are grammatical. This overlooking is because assuming that these few realizations that violate SSP are arbitraries that may be telling us that in the future the superheavy syllable CVCC is going to be more accommodated. Hence, the constraint *CVCC might become an undominated constraint in the hierarchy of future KħA.

As for the extraprosodic structure, WEAKC>> PARSE^{Seg} is the ranking that is required for this dialect so that extrasyllabicity is accounted for. In the stem-level, the ranking that is proposed appears in tableau 5.12 below. The example in this tableau is /ʃi$^\mu$ʕ$^\mu$r-$^\mu$/ "poetry".

/ʃiᵘʕᵘr-ᵘ/	σ≤2μ	σμμ=2μ	*[σCC	SONSEQ	DEPᵘ	WEAKC	PARSESeg	MAXᵘ	Lex μ	DEPvowel	*CVCC
a. [ω[ɑʃiᵘʕᵘ]r]				!*			*	*	*		*
b.[ω[ɑʃiᵘʕᵘrᵘ]]	!*			*		*					*
c.[ω[ɑʃiᵘrᵘ]]			!*			*		*	*		
d.[ω[ɑʃiᵘ][σʕiᵘrᵘ]] ☞						*				*	
e.[ω[ɑʃiᵘ][σʕiᵘr]]		!*				*		*			

Tableau stem-level 5.12

The input in tableau 5.12, (i.e., /ʃiᵘʕᵘr-ᵘ/ "poetry") has a final-CC that violates SSP. Since KħA restrains to SSP the winner candidate has to be less faithful to satisfy the undominated SONSEQ. To explain, unsatisfying SONSEQ causes a fatal penalty that is avoided through an insertion of a vowel which is penalized by DEPvowel. The cost of a penalty from DEPvowel is a price that can be afforded by an output winner because it is a low ranked constraint. In addition, the still stranded mora can host an epenthetic vowel which means that the high ranked constraint DEPᵘ will not be violated. On the other hand, implementing other strategies to avoid a penalty from SONSEQ would cost more. For instance, the output (c.) violates the high ranked constraint *[σCC because complexity in onset is prohibited in KħA. The situation will be different if the input does not possess a final-CC that has a potential of violating SSP. Tableau 5.13 below has the example /muᵘlᵘk-ᵘ/ "Clouts".

/muᵘlᵘk-ᵘ/	σ≤2μ	σμμ=2μ	*[σCC	SONSEQ	DEPᵘ	WEAKC	PARSESeg	MAXᵘ	Lex μ	DEPvowel	*CVCC
a. [ω[σmiᵘlᵘ]k] ☞							*	*	*		*
b.[ω[σmuᵘ][σluᵘkᵘ]]						!*				*	

Tableau stem-level 5.13

Observe that the candidate that has a penalty from DEPᵘ is the one that loses this time whereas the winner is not assigned a violation from DEPᵘ. The difference is because the input in tableau 5.12 violates SSP whereas the input in 5.13 does not. Thus, in tableau 5.12 the fatal penalty is assigned by SONSEQ whereas the fatal penalty is assigned by WEAKC. To illustrate, the insertion of a vowel in tableau 5.13 is not needed because the input /muᵘlᵘk-ᵘ/ already satisfy SONSEQ. Hence, the wining was for the candidate that satisfies the demand for a one extrasyllabic consonant.

249

In the word-level, we find morphology reacts to reduce the exertion of supplying an epenthetic vowel by phonology. Thus, just like IBA, we will need the constraint No [eV] to account for the blocking for the vowel insertion in word-level. However, in contrast to IBA which highly operate the vowel insertion in KħA the operating of this process is less in both the stem-level and the word-level. As mentioned before, this dialect operates this process in both the stem-level and word-level mainly to satisfy SSP. Therefore, in the word-level, the epenthetic vowel occurs only in the instances in which morphology is not able to offer a vocalic alternative to make sure that SonSeq is satisfied. Accordingly, I propose the following hierarchy:

{σ≤ 2μ; σ$_{μμ}$ =2μ; *[$_σ$CC; SonSeq; Dep^μ}>>WeakC>> Parse^{Seg} >> No [eV]>> Max^μ ; Lex μ >> Dep^{vowel}; Max^{vowel}>> *CVCC

5.6.3.3 ECA dialect

The situation is totally different in ECA. In the stem-level of this dialect there is no evidence of any kind that there is a stranded mora of the lost case. Therefore, there is no evidence that justifies transcribing a stranded mora in the input of the stem-level. In contrast, in the word-level the collected data demonstrates that the stranded mora of the lost case is preserved by a corporation between phonology and morphology. Hence, the input of the word-level has to display a stranded mora that needs to be associated in the output with a segment. Indeed, in the word-level, in contrast to the stem-level, the winner candidates display a vowel insertion if morphology is not supplying a vowel-initial suffix. This raises a critical issue because in Stratal OT the input of the word-level is the output of the stem-level. In other word, in Stratal OT the assumed stratification interfaces within serialism fashion (see Kiparsky, 2014). In addition, Stratal OT restrains to the markedness and faithfulness constraints without imposing any other type of constraints that might overcome this critical issue. Observe that in this dialect the stranded mora is also preserved in the phrase-level and not only mainly in the word-level. Therefore, the output of the word-level, which is based on Stratal OT theoretical assumptions is the input of the phrase-level, is expected to fit without causing any critical issue.

I think a way to solve the critical issue regarding the output of the stem-level is to assume that the winner candidate in the stem-level is [$_ω$[$_α$ʃi^{μ}ʕ^μ]r^μ] not [$_ω$[$_α$ʃi^{μ}ʕ^μ]r]. The difference between the two candidates is that the candidate that has strikethrough mora is supposed to inform that even though the mora is not realized in the output but it has to be

injected to it. Hence, the word-level receives an input from the stem-level that has the stranded mora. The injection of a stranded mora is in both the input and the output of the stem-level, but in the output the winner candidate surfaces with a strikethrough stranded mora. This is the theoretical solve that is taken in the analysis as will be seen. Because of this solve the constraint Lex μ is visible in the stem-level of ECA and is satisfied by the strikethrough on the stranded mora. Observe that this is a false in the analysis because the formulation of the constraint Lex μ is specific in terms that the stranded mora has to undergo conservatism mainly if it prevents innovation. Since in reality the innovation in the stem-level is not prevented then the strikethrough on the stranded mora is not moraic conservatism. It is true that modifying the formulation of Lex μ is possible but it is not sufficient as the false in the analysis will remain. This false is that the injected information is not part of the reality of data whereas an analysis is supposed to describe the reality of data. I think that what distinguishes a good analysis from another is the accuracy in describing the reality of data. Before introducing the analysis an important notifications has to be informed. I do not assume that the strikethrough on the stranded mora of the output satisfies MAX^μ but I rank Lex μ over it in the stem-level.

In the stem-level, I assume the existence of almost the same constraints that were recognized in the hierarchies of IBA and KħA but within different ranking. For instance, the constraint *CVCC is invisible in the stem-level but undominated in the word-level. The invisibility of *CVCC in the stem-level is because in the CVCC stem-form is a common pattern in ECA as far as the collected data. In tableaux 5.13 the example is /ʃi^{μ}ʕ^{μ}r-^{μ}/ "poetry".

/ʃi^{μ}ʕ^{μ}r-^{μ}/	σ≤2μ	σ$_{μμ}$=2μ	*[$_σ$CC	DEP^{vowel}	WeakC	Lex μ	MAX^μ	PARSE^{Seg}
a.[$_ω$[$_σ$ʃi^{μ}ʕ^μ]r$^{μ̶}$] ☞							*	*
b.[$_ω$[$_σ$ʃi^μ][$_σ$ʕi^{μ}r^μ]]				!*	*			
c.[$_ω$[$_σ$ʃi^{μ}ʕ^μ]r]						!*	*	*
d.[$_ω$[$_σ$ʃi^μ]r$^{μ̶}$]			!*				*	*
e. [$_ω$[$_σ$ʃi^{μ}ʕ^{μ}r^μ]]	!*	*			*			

Tableau stem-level 5.14

The ranking that appears in tableau 5.14 is the assumed for the stem-level of ECA. Starting with the loser candidates, it can be seen that candidate (b.) loses because the anti-epenthesis constraint DEP^{vowel} is high ranked. Therefore, since this candidate displays a vowel insertion that is associated with the stranded mora it loses. The loss of candidate (c.) is

because a fatal penalty that is assigned to it by the constraint Lex μ. The justification for this penalty is that the injected stranded mora is not preserved. As for candidate (d.), it loses because the undominated *[$_\sigma$CC penalizes it for the initial consonantal cluster. Finally, the candidate (e.) loses because of the fatal penalty from the undominated σ≤ 2μ which prohibits syllables exceeding two morae. In contrast, the winner candidate (a.) wins because the penalty from MAX$^\mu$ is of no significance considering the penalties which the other candidates have been assigned with.

In word-level, it is observed that morphology and phonology resolve the extrasyllabic consonant. Morphology supplies the structures in specific categories with vowel-initial suffixes whereas in the categories that it supplies consonant-initial suffixes phonology operates vowel insertion. In addition, in this level the stranded mora is preserved whether through the morphological vocalic supplement or through the vowel insertion. This shows the importance of MAX$^\mu$ and Lex μ which are undominated constraints in the hierarchy of the word-level. In tableau 5.15 below the winner candidate of the input /ʃi$^\mu$ʕ$^\mu$r$^{\text{#}}$+hu$^\mu$m$^\mu$/ "poetry.3Pers.Plur" is the one that preserves the stranded mora.

/ʃi$^\mu$ʕ$^\mu$r$^{\text{#}}$+hu$^\mu$m$^\mu$/	Lex μ	MAX$^\mu$
a.[$_\omega$[$_\alpha$ʃi$^\mu$ʕ$^\mu$]r][$_\sigma$hu$^\mu$m$^\mu$]]	*	*
b.[$_\omega$[$_\alpha$ʃi$^\mu$ʕ$^\mu$][r*u*$^\mu$][$_\sigma$hu$^\mu$m$^\mu$]] ☞		

Tableau word-level 5.15

On the other hand, in the tableau 5.16 and tableau 5.17 below a ranking is provided to illustrate another difference that distinguishes ECA in the word-level from the other Arabic dialects. The example in tableau 5.16 displays an inflected-form that is formed by inflecting the output of the stem-level with a vowel-initial suffix whereas in tableau 5.17 the same example is inflecting with a consonant initial. In tableau 5.16 it is /ʃi$^\mu$ʕ$^\mu$r$^{\text{#}}$ +a$^\mu$k/ "poetry.2Pers.Sing" whereas in tableau 5.17 it is /ʃi$^\mu$ʕ$^\mu$r$^{\text{#}}$+ha$^\mu$/ "poetry.3Pers.Sing.Fem".

/ʃi$^\mu$ʕ$^\mu$r$^{\text{#}}$+ha$^\mu$/	σ$_{\mu\mu}$=2 μ	*CVCC	No [eV]	DEP^{vowel}	PARSE^{Seg}	WEAKC
a.[$_\omega$[$_\alpha$ʃi$^\mu$ʕ$^\mu$][$_\sigma$r*a*$^\mu$][$_\sigma$ha$^\mu$]] ☞			!*	*		*
b.[$_\omega$[$_\alpha$ʃi$^\mu$ʕ$^\mu$]r][$_\sigma$ha$^\mu$]]		!*		*	*	
c.[$_\omega$[$_\alpha$ʃi$^\mu$][$_\sigma$ʕ*a*$^\mu$r$^\mu$][$_\sigma$ha$^\mu$]] ☹						*

Tableau word-level 5.16

/$\int i^\mu \Upsilon^\mu r^{\mathbf{r}} + a^\mu k$/	*CVCC	No [eV]	DEP^{vowel}	PARSE^{Seg}	WEAKC
a.[$_\omega$[$_\sigma \int i^\mu \Upsilon$][$_\sigma ra^\mu k^{\mathbf{r}}$] ☞					*
b.[$_\omega$[$_\sigma \int i^\mu$][$_\sigma \Upsilon i^{\mathbf{r}}$][$_\sigma ra^\mu k^\mu$]]		*	*		*
c.[$_\omega$[$_\sigma \int i^\mu \Upsilon^\mu$][$_\sigma r i^{\mathbf{r}} k^\mu$]] ☹					*

Tableau word-level 5.17

Because in ECA the position of vowel insertion is different from that is exhibited in IBA and KħA a problem faces the proposed ranking in tableaux 5.16 and 5.17. The blocking of the vowel insertion cannot be claimed to be due to surfacing the inserted vowel in a light syllable. This is because in contrast to IBA and KħA, in ECA the inserted vowel in the grammatical candidate always surfaces in light syllables. The reason behind this is the direction of insertion as can be seen from contrasting with the grammatical candidate (a.) in tableau 5.17 with the ungrammatical candidate (c.). In IBA and KħA the inserted vowel surfaces between the final -CC of the root whereas in ECA it surfaces after the final C of the root, (i.e., the exact position of the lost case). The candidate (c.) in tableau 5.17 escapes a penalty even though ECA does not surfaces epenthetic vowels in heavy syllables whereas the grammatical candidate (a) loses because a fatal penalty from No [eV] which prohibits the realization of epenthetic vowels in light syllables.

Observe that the issue of the vowel insertion direction in the modern Arabic dialects has been already discussed in phonological theoretical works. For example, Itô, J. (1989: 241-251) proposes 'Directional Parameter Settings' for 'Cairene and Iraqi Arabic'. I propose to account for the directionality of vowel insertion in the modern Arabic dialects through two constraints that impose different prohibition for vowel insertion in term of the position of insertion. In the hierarchy of ECA, instead of No [eV], which demands that inserted vowels do not surface in light syllable, I propose No [Ev] which demands that the inserted vowels do not surface in heavy syllables. The constraint No [eV] is assumed to be invisible in ECA whereas in IBA and KħA I assume No [Ev] is invisible. The ranking in the tableaux 5.16 and 5.17 is amended as can be seen in tableaux 5.18 and 5.19 below.

/$\int i^\mu \Upsilon^\mu r^{\mathbf{r}} + a^\mu k$/	*CVCC	MAX^{vowel}	No [Ev]	DEP^{vowel}	PARSE^{Seg}	WEAKC
a.[$_\omega$[$_\sigma \int i^\mu \Upsilon$][$_\sigma ra^\mu k^{\mathbf{r}}$] ☞						*
b.[$_\omega$[$_\sigma \int i^\mu$][$_\sigma \Upsilon i^{\mathbf{r}}$][$_\sigma ra^\mu k^\mu$]]				!*		*
c.[$_\omega$[$_\sigma \int i^\mu \Upsilon^\mu$][$_\sigma r i^{\mathbf{r}} k^\mu$]]		!*	*	*		*

Tableau word-level 5.18

/ʃiˤᵘʕᵘrˣ+haᵘ/	σμμ=2 μ	*CVCC	MAXᵛᵒʷᵉˡ	No [Ev]	DEPᵛᵒʷᵉˡ	PARSEˢᵉᵍ	WEAKC
a. [ω[σʃiˤᵘʕᵘ][σraᵘ][σhaᵘ]] ☞					*		*
b. [ω[σʃiˤᵘʕᵘ]r][σhaᵘ]]		!*			*	*	
c. [ω[σʃiᵘ][σʕaᵘrᵘ][σhaᵘ]]				!*			*

Tableau word-level 5.19

After amending the ranking, the grammatical candidate (a.), which is in tie with the ungrammatical (c.) in tableau 5.16, wins because it has the fewest and the lowest penalties as can be seen in tableau 5.18. To explain, the ranking is amended by the anti-deletion constraint MAXᵛᵒʷᵉˡ which assigns a fatal penalty to the ungrammatical candidate (c.) because of deleting the input vowel of the suffix. In addition, (c.) receives penalty from No [Ev] because the inserted vowel is surfacing in a heavy syllable. The constraint No [Ev] is the significance for the dialect ECA as it does not surface inserted vowels in heavy syllables. Therefore, substituting the visibility of No [eV] with the visibility No [Ev] gives the accurate result. Another penalty that is assigned to (c.) is from DEPᵛᵒʷᵉˡ which prohibits vowel insertion. As for the candidate (b.), even though it is exhibiting the epenthetic vowel in a light syllable but it is the insertion that gives the grammatical candidate the opportunity to win. This is because DEPᵛᵒʷᵉˡ is higher than WEAKC which is the only constraint that assigns a penalty to the grammatical candidate. Therefore, the amended ranking gives the grammatical candidate superiority to win. In addition, the amended ranking improved the analysis in a way that one can see the least optimal candidate more correctly. Whereas in tableau 5.16 the least optimal candidate incorrectly is the candidate (b.), in tableau 5.18 the least optimal candidate is (c.). The selection of (c.) as the least optimal candidate is more compatible to the grammar of ECA.

The effects of amending the ranking can be also seen by contrasting the tableau 5.17 with the tableau 5.19. The grammatical candidate (a.) is not assigned anymore with a fatal penalty because No [eV] is invisible in 5.19. In addition, the ungrammatical candidate (c.) loses because of a fatal penalty from No [Ev] which is among the undominated constraints in the amended ranking in tableau 5.19. As for the penalty from DEPᵛᵒʷᵉˡ, which the grammatical candidate (a) receives in tableau 5.19, it is of no importance because it does not prevent it from winning. The undominated constraint *CVCC is the reason behind the unimportance of a penalty from DEPᵛᵒʷᵉˡ when a consonant-initial suffix is the supplied. To

explain, in word-level, the syllable CVCC has to be resolved whether the inflecting is with a vowel-initial suffix or with a consonant-initial suffix. The vowel-initial suffixes resolve the complex CVCC base by syllabifying the final C as onset. In contrast, the consonant-initial suffixes do not resolve the CVCC base which requires operating vowel insertion. Because of the different way of resolving CVCC it is noticed that irritating *CVCC is more possible when morphology is supplying a consonant-initial suffix. As can be seen from tableau 5.19, the cost of a penalty from DEP^{vowel} is the satisfaction of the undominated *CVCC. However, because vowel-initial suffixes resolve the CVCC base in tableau 5.18 the penalty from DEP^{vowel} is of importance. Since the grammatical candidate does not display epenthetic vowel as CVCC is resolved morphologically it does not violate DEP^{vowel}. In order that the analysis captures the importance of a penalty from DEP^{vowel} this constraint has to penalize those candidates that display vowel insertion which is achieved in the amended ranking. In tableau 5.18 the winning of the grammatical (a.) over the ungrammatical (b.) is because the latter is displaying vowel insertion which even though it satisfies undominated constraints like *CVCC, MAX$^{\mu}$ and Lex μ but it inserts unneeded vowel.

A point that is worth to be re-emphasized, because the mora of the lost case in the word-level is still preserved the ungrammatical light rhyme /a$^{\mu}$k/ is resolved in tableau 5.18. The weightless coda in the input becomes a weight-contributing coda due to associating it with the stranded mora. The final proposed hierarchy for the word-level is:

{σ≤ 2μ; σ$_{\mu\mu}$ =2μ; *[$_{\sigma}$CC; *CVCC; Lex μ; MAX$^{\mu}$; MAX^{vowel}}>> NO [Ev]>> DEP^{vowel} >> PARSE^{Seg} >> WEAKC

Nonetheless, observe that this proposed hierarchy does not account for an important finding in ECA. The quantity and quality of the epenthetic vowels in this dialect is very systematic. For instance, it is /a/ if the pronominal inflection was [-ha] "3Pers.Sing.Fem" whereas it is the round [u] if the pronominal inflection was [hum] "3Pers.Plur".

Lastly, an import finding is that ECA restricts the vowel insertion to mainly the phrase-level and word-level. The higher level, (i.e., the stem-level) does not show any evidence for the vowel insertion process. The implication of this on the notion of the life cycle of phonological processes is discussed in chapter six.

5.6.3.4 MMA dialect

This is the most difficult Arabic dialect I have ever faced in my life even though, being an Arab myself and due to media, I have experienced different Arabic dialects. I needed a translator to understand what my informants are saying, not always of course but the need existed[33]. The issue is beyond phonology with this dialect which is known for the considerable amount of borrowed vocabularies from other languages in contrast to other Arabic dialects. The stage of change morpho-syntactically in this dialect exceeds my expectations for an Arabic dialect that is practiced today. For instance, even though the 2Pers.Sing morpheme is still preserved but contrary to the other Arabic dialects it does not express gender distinction. Moreover, as far as two of my informants they do not use the 2Pers.Sing suffix that much. Based on them, many words of my list are used with the word [djaalik] which, as said before, appears to be a function word that is substituting the bound morpheme, (for more about this issue see footnote 17 in this chapter).

Therefore, this dialect in particular needs to be reinvestigated by implementing different criteria that consider more thoroughly the amount of change that is exhibited in this dialect in different aspects of the grammar, (i.e., phonology, morphology, syntax and semantic). Moreover, as said in chapter four, the collected data of MMA exhibit high degree of inconsistency which I think justifies the need for collecting more data before agreeing on the main generalization about this dialect. Accordingly, the proposed ranking in this section for this dialect is in need for caution because of the extent of overgeneralization.

Nonetheless, based on the phonological findings, MMA has to have SONSEQ in its constraint hierarchy in both stem-level and word-level. The constraint SONSEQ insures penalizing those candidates that do not obey SSP. However, contrary to KħA, the Arabic dialect which also was found restraining to SSP, in MMA it is not just epenthesis that is used as a repair strategy to satisfy SONSEQ. The shift CVCC→CCVC and the morphological substitution of stems with other related word-family or borrowed words function as processes that motivate avoiding the violation of SSP. Hence, even though CVCC is allowed to surface in MMA but I presume that the constraint *CVCC will be outranked by SONSEQ in both the stem-level and the word-level.

In addition, because there are three processes are invoked to insure the satisfaction of SONSEQ I assume the following three constraints in the hierarchy of both the stem-level and

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[33] I owe my friend Ender Taher for introducing me to two of my informants. I owe her as well for translating when the understanding was not accomplished during the communications.

the word-level. The anti-epenthesis constraint DEP^{vowel} is the first as an insertion for a vowel is operated to prevent final CC that violates SSP from surfacing. The second is LINEARITY^{root} which requires that the sequential ordering segments in the root of the input must be reflected in the root of the output. This constraint is proposed because of the root-metathesis/the shift CVCC→CCVC which MMA is found practicing to prevent violating SSP. Finally, the constraint *MorphSub is proposed in the hierarchy. I introduce this constraint as a faithfulness constraint that has this prohibition: Morphological substitutions are prohibited. This constraint is needed because the noticed practicing for morphological substitution as a way to escape violating SSP. As mentioned in chapter four, the collected MMA shows that the singular form might be substituted with (i) another form of the same stem, (ii) different word that might be borrowed from other language. The proposed ranking in the stem-level and the word-level that is assumed between these 4 constraints is: SONSEQ>> DEP^{vowel}; LINEARITY^{root}; *MorphSub.

Moreover, since there is an implementation for the epenthesis process then the constraint Lex μ has to appear in the hierarchy of both the stem-level and the word-level, which means that MMA still has the stranded mora of the lost case vowel.

Furthermore, I assume that *[$_\sigma$CC which prohibits complex onset is invisible in MMA contrasting in this with the other investigated modern Arabic dialect. This is because MMA accommodate CCVC syllable type.

In the stem-level I propose the following hierarchy:

{σ≤ 2μ; σ$_{μμ}$ =2μ; SONSEQ; DEP^μ}>>WEAKC>> PARSE^{Seg} >> MAX^μ ; Lex μ >> DEP^{vowel}; LINEARITY^{root}; *MorphSub >> *CVCC

In the word-level, the inflected-forms of MMA show that the 3 resolution processes that are meant to satisfy SONSEQ may be blocked. However, due to the inconsistences I cannot rank the constraints in the hierarchy. Moreover, the blocking is not always because morphology is supplying vowel-initial suffix. However, I know from the direction of the vowel insertion that in the hierarchy of the word-level the constraint No [eV] not No [Ev] is the visible. No [eV] prohibits the realization of epenthetic vowels in light syllables whereas No [Ev] prohibits the realization of epenthetic vowels in heavy syllables. Hence, MMA inserts the vowel in heavy syllables just like IBA and KħA. The blocking of root-metathesis and morphological substitution might be accounted for through ranking LINEARITY^{root} and *MorphSub higher. Nonetheless, principally I assume this ranking in word-level:

$\{\sigma \leq 2\mu; \sigma_{\mu\mu} =2\mu; \text{SONSEQ}; \text{DEP}^{\mu}\} >> \text{WEAKC} >> \text{PARSE}^{\text{Seg}} >> \text{MAX}^{\mu}; \text{ Lex } \mu >> \text{DEP}^{\text{vowel}}$

I leave for future research the decision regarding ranking the constraints No [eV], LINEARITY$^{\text{root}}$, *MorphSub and *CVCC.

5.6.3.5 Overall

The proposed analysis is not an end; rather, it is a beginning as there are several non-accounted for data and there are analytical problems that can be noted by an observant. For instance, I have not *talked* about the glottal stop in the modern dialects because its status needs a systematic investigation. The only exclusion is IBA as I overgeneralized the power of *GLOTTAL$^{?}$ which is specialized with the prohibition of mainly the glottal stop. In addition, the root-vowel substitution and the gemination were not approached in both eras. I also did not discuss evolution of CVVC and CCVC nor approached the issue of shorting the CVVC type of syllable in ECA. Several reasons made me decide to do so. For instance, the data that is collected do not contain many investigated words with underlying glottal stop and geminate. As for overlooking the evolution of CVVC and CCVC, it was done because I wanted to keep the focus centred on the thesis of this study which essentially is about the evolution of CVCC in Arabic.

5.7 Conclusion

In this chapter a claim was argued that is there is a conflict between syllable well-formedness and moraic conservatism. By utilizing the tools of Stratal OT and adopting Bermúdez-Otero's (1999) implementation of moraic approach in OT, an analysis was built to account for this conflict. The developed analysis in this chapter is a primary and is in need to be extended with more investigations and amendments.

Chapter 6
The Conclusion
A last word

6.1 Introduction

Several related topics are addressed in this chapter. The first is related to the issue of what can be considered an innovation in the Arabic language, a language that has a strong reputation of stability against change. This is addressed in the next section. The third section focuses on connecting the findings to the life cycle of phonological processes. The fourth section is concerned with some theoretical observations I have noted when consulting some Western research papers which I feel that I need to bring the attention to. The fifth section is concerned with cultural concerns I have due to specific mistakes that are made by some phonologists. The sixth section is devoted for those who are working in the field of ALT tradition. The core of the discussion is the extent to which we can adopt the theories and ideas of Western linguistics. The last section is focused on the limitations of this study.

6.2 Innovation in Arabic language

Owens (2006: 268) admits that he 'purposely downplayed' the finding of 'significant changes […] among Arabic dialects'. I have tried in this thesis to show that significant changes in Arabic are there but there is a need for efforts to understand them within the concept of language-specific property. It is interesting that even though this language is highly documented but we still have views that claim that 'there are far too many open questions to expect a comprehensive account now or any time soon' (Owens, 2006: 267) for the history of Arabic. I argue against such views and send calls for ambitious researchers. The fact that there are documentations that are so early and detailed means that the theories about language change can be significantly informed from studying the diachronic and synchronic of this language.

As for the type of innovations in Arabic, I do think that the problem is not that there is no recognition for innovations in Arabic. Rather, the problem is that the process of collecting data and the process of approaching the data methodologically requires more scientific standards in their application. In this study, I aimed for a systematic application from the beginning by focusing on only one feature that is known to have been lost, (i.e., the case vocalic markers). The main focus was also on certain innovations, (i.e., the innovation of CVCC syllable type and the application of epenthesis process). To insure that the investigation is systematic methodologically, I tried to trace the structures through implementing specific steps. For instance, the words that are investigated in the classical era

and the modern era are the same words. The criteria that were behind selecting the searched words were explained as explicit as I can. The sources were specific and limited. As for the investigated modern dialects, I was guided by Western phonology literature in selecting them. For the classical era, I took the action of recognizing variations instead of dialects because of the sources that I am aware of. The use of ALT establishments in this study considered a low degree of knowledge about these establishments because the thesis is articulated within WL establishments and those who may read it most probably are specialized in WL not ALT. I think that a systematic application may help the development of research on the Arabic language change.

6.3 The life cycle of phonological processes in the light of the results

This section is devoted to bring the attention to similarities and differences of the results that have been discovered in this study with the findings that are related to the life cycle of phonological processes. The life cycle of phonological processes is a notion which Bermúdez-Otero (1999: 99-104) is attributing its proposal to Kiparsky 1998. According to Bermúdez-Otero (1999: 99), Kiparsky's proposals, which paraphrase Givón 1971, 'entail that today's lexical phonology is yesterday's postlexical phonology'. I argue that this statement summarizes the whole phenomenon of phonological change in Arabic. In particular that it has been demonstrated that the innovation of CVCC occurred in the pausal position in the phrase-level, (i.e., the postlexical phonology). In this section, utilizing Bermúdez-Otero's excerpt (ND) of his 2012 paper, I aim to show that the results of this study assert the life cycle of phonological processes in some respects but not all.

The life cycle of phonological processes is supposed to be a diachronic pathway of phonological change that is concerned with 'long-term historical evolution' 'of sound patterns'. These refer to '"rules" or "processes"' (Bermúdez-Otero, 2011: 1). I like here to cite this long quotation of Bermúdez-Otero's because in brief words it explains this pathway change which is, to a great extent, recognized by the Western researchers to be 'unidirectional':

> Most linguistic sound patterns first arise through events of "phonologization" (Hyman 1976), whereby an articulatory, acoustic, or auditory phenomenon beyond human cognitive control gives birth to a new language-specific pattern of gradient phonetic implementation. As they evolve, however, these new phonetic patterns tend to become increasingly detached from their grounding in the physics and physiology of speech. First, sensitivity to continuous phonetic dimensions is replaced by reference to discrete phonological features ("stabilization"; Bermúdez-Otero 2007: 504-06, after Hayes and Steriade 2004: §5.6). Later, categorical phonological rules, which initially apply across the board, acquire morphosyntactic conditions, notably through the narrowing of their "cyclic

260

domains" (Bermúdez-Otero: 2006: 504, 2011: 2024-25), and may go on to develop lexical exceptions. Eventually, phonological rules may become altogether "morphologized" (Anderson 1988: 329ff) or "lexicalized".

(Bermúdez-Otero, ND: 2)

As far as I have understood Bermúdez-Otero, there is an understanding that the stage of phonologization has a 'structural-preserving bias'. The epenthesis of the round vowel in the classical era, which is the main finding of this study, evidently expresses such bias for keeping/preserving the structures of words simple without complexity in final margins. Hence, the 'structural-preserving bias' is to preserve the simplex type of syllabic inventories in Arabic and to keep the word realizing within similar structures. However, in the previous chapter it has been shown that neither the epenthesis nor the other processes remained in the phrase-level, (i.e., the postlexical phonology level). Instead, transition of the processes from phrase-level to the other higher levels is evident. For instance, whereas IBA applies epenthesis in stem-level, ECA does not have such application in the stem-level, but it has it in the word-level and phrase-level. This asserts the description that 'the life cycle of processes works like an escalator' which is given in Bermúdez-Otero's (ND: 10). We saw that the processes, which were implemented only in the phrase-level in the classical era, are lifted in the modern era to higher levels. It is interesting to note that the modern Arabic dialects manifest variations in terms of this transition. Bermúdez-Otero (ND: 11) states that 'In general, older processes will tend to apply at higher levels than younger ones'. Thus, the variation that is witnessed might inform how old is a process is operated in a dialect.

On the other hand, Bermúdez-Otero (ND: 11) states that 'if a phonological rule applies variably at more than one level, then higher strata should exhibit equal or smaller application rates than lower strata, for it is in the lower strata that the process will have been active the longest'(Bermúdez-Otero's ND: 11). By considering both the stem-level (the higher stratum) and the word-level (the lower stratum) of the investigated modern Arabic dialects, we can see that the application of the vowel insertion does not match Bermúdez-Otero's statement. For instance, in IBA and KħA, even though there is in the stem-level a phonological environment in which the vowel insertion does not operate in, (e.g., when the root has underlyingly final glottal stop and glides) but this environment is very small considering the size of blocking the vowel insertion in the word-level. Therefore, I think that the lower stratum, (i.e., the word-level) in these two dialects exhibit smaller application rates than the higher stratum, (i.e., stem-level). However, I admit I did not make a calculation it is just my impression. It was also found that the epenthesis is operated in the word-level and phrase-level but not the stem-level in ECA. The finding in ECA matches Bermúdez-Otero's statement because in the

higher stratum/stem-level the insertion is operated less than in the word-level as the rate of operating it in the stem-level is zero. Yet, I do not know the rate of operating the process in the phrase-level in contrast to the word-level.

Overall, I have tried in this section to show that Arabic presents an interesting case for those who are interested in the life cycle of phonological processes. The pausal position of a word in the phrase-level is distinctive as it was a window for a specific type of sound change. Moreover, it was found that phonology reacted by implementing processes to close this window to prevent innovation. IBA is an example that shows how efficient phonology was with a high rate of preservation of the moraic weight and strong prohibition for CVCC contrasting with the other investigated Arabic dialects.

There is evidence in the literature that the pausal position is still unique in the modern era in terms of introducing new sound patterns in Arabic. For example, Kiparsky (2002: 4) informs that there is a desonorisation of word-final –VCR and –VVR in the modern era in some Arabic dialect. The region that he gives as an example is Yemen. Watson (2007: 339, 345-347) gives a little more detail about this process as she specifies that it is a 'pausal glottalization' since it occurs 'in utterance-final position'. According to Watson (2007) it is a feature restricted to specific areas of Arabic world, including Central Yemeni dialects, dialects of the south-Western Saudi Asir and several dialects in Egypt. The example that has taken my attention to in Watson (2007) is the word /samn/→ [samʔn] "ghee" from Sanʿani, contrasting with the pronunciation [sam*i*n]. Kiparsky (2002) assumes complementary distribution between epenthesis and desonorisation, but Watson counters with more details that show that this phenomenon is more complex and is not restricted to word-final position. Watson (2007) refers within examples to related phenomena such as glottaling the pharyngeal /ʕ/ in pause. Either way, this pausal glottalization in Arabic is a worth of investigation phenomenon in terms of discovering its historical origin. My 7th century data of the classical era does not provide evidence for the existences of this process. However, Sibawaih informs of a similar phenomenon, which was observed in both verbal and nominal data (see the pages 176-177, vol. 4, in Haaruun's edition of Sibawaih's book). Hence, we can trace it to the 8th century but as far as my data not to 7th century.

Nonetheless, I provide some of Sibawaih's data below. The italic pausal nominal data in (1) and (2) are pausal realizations. The boldfaced segments are those of concern.

(1a) raʔajtu *raʒul-a**ʔ*   instead of   (1b) raʔajtu *raʒul-a**a*   "I saw a *man.Acc.paused*"

(2a) haaðihi *ħubla**ʔ* instead of (2b) haaðihi *ħubla**a* "This.Fem.Sing is *pregnant.paused*"

The understanding that I have gained from Sibawaih's words is that his source for his data structures in (1a) and (2a) is his tutor Alxaliil. His style gave me the impression that the glottalization phenomenon in that era was not that common. This is because Sibawaih used the verb زعم which means "he claimed" instead of قال which means "he said" when attributing the data to his tutor. Thus, I considered Sibawaih's action as a way to inform that he is not familiar with Arab speakers who produce such structures. Those in (1b) and (2b) are from the common standardized dialect of the classical era.

Sibawaih's examples are distinct from the modern data that Watson (2007) provides but investigating the relation between the two phenomena may reveal of some connection. Notably, the glottalization, which Sibawaih's examples show, is controlled with specific conditions. To explain, the example (1a) indicates that if an accusative indefinite nominal word is paused the accusative marker does not lengthen as in (1b), which is the standardized pattern. Rather, there were Arabs who would substitute the nasal marker /n/ that marks the indefiniteness with a glottal stop. Hence, in the 8th century we have the following two realizations for the indefinite accusative pausal suffix [-aa] and [-aʔ]. The example 2 shows that the glottalization phenomenon in that era occurs only when the nominal words end with /a/, whether this vowel is a marker or is part of the underlying stem.

Nonetheless, I do not think that the pausal position is the only window in a phrase for innovation in Arabic. I think the initial position and the contextual position are other windows. The issue is that each window has its own processes. These processes, however, interact leading to the spread of some features into the forms that are surfaced in the other positions. I take the transition of u-insertion and ʔ-deletion and its compensatory lengthening to the contextual forms as evidence.

6.4 Theoretical concerns

Through consulting Western papers I have noted that many of our generalizations, conclusions and deductions in ALT field of study have been introduced to Western phonology. The more I understand Western phonology the more I have specific theoretical concerns about this practice by researchers. The reason is that even though there are agreements in many aspects between the two fields of study, (i.e., ALT and Western phonology), there are clear significant differences. For instance, the clearest difference, as far as I perceive the theories of both fields, is that Western phonology views the consonants and vowels as *segments* whereas in ALT we, respectively, view the consonants as a component of *letters* and the vowels as *movement processes* that *move* the state of a consonant.

263

Consequently, for us in ALT we recognize theoretically two main phonological units, these are, حرف ساكن *Saakin letter* and حرف متحرك *Mutaħarrik letter*.

According to Al-Nassir (1993: 21), suggested English translations for these two terms include "quiescent" by Saaran 1951 for حرف ساكن *Saakin letter*, which is also translated as "asyllabic" and "unvowelled" by Bakalla 1970. The term حرف متحرك *Mutaħarrik letter* is translated by Bakalla 1970 as "syllabic" and "vowelled". As one can envisage from the translations, the component of these two phonological units is not a singleton the way it is in Western phonology. This distinction affects the measurements that are concluded by the researchers of the two fields. To explain this, a binary-surface in the representation of sounds is assumed by both fields. The term phonemic analysis presents the conceptualization of Western phonology for this understanding of a binary-surface of representation. In ALT we do not have a specific term but we *practice* theoretically a binary-surface of representation for the sounds. Because both fields have its own distinctive measurement units, as mentioned above, distinct relationships between the sounds are recognized descriptively in the two fields. I try to explain the significance of this distinct in the next paragraphs.

In Western phonology, phonemic analysis distinguishes between the relationships between a phoneme and allophones in the following manner: A sound like /p/ in English is terminologically referred to as a phoneme that has allophones [p], [pʰ] and [p˺] as one finds in handbooks that introduce Western phonology. The substitution of any of the three allophones in each other's position does not lead to a change for the semantic meaning of a word. On the other hand, the change of a phoneme, (e.g., /k/ instead of /p/) would lead to a change in the semantic meaning. Hence, there are two levels for a segment, that is the abstract level and the surface level.

In ALT we also distinguish between حرف " letter" such as باء /b/ as a concrete unit that has subunits: بَ [ba], بُ [bu], بِ [bi], با [baa], بو [buu], بي [bii], بِّ [bbi], بُّ [bbu], بَّ [bba], بّا [bbaa], بّو [bbuu], بّي [bbii] and بْ [b] [34]. Thus, the concrete unit in ALT is a singleton but its subunits are not. Even بْ [b] is not a singleton since it is conceptually viewed as a status in which a letter is not processed by a vowel and not just a consonant or a segment. Contrary to Western phonology, the substitution between subunits leads to change the meaning of a

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[34] How ALT views the glides is more complex. To explain, Al-waaw الواو is a concrete unit that expresses the following subunits: [wa], [wu], [wi], [waa], [wuu], [wii], [wwa], [wwi], [wwu], [wwuu], [wwii], [wwaa] and the long vowel [uu]. Hence, in contrast to western phonology, it has a doubled identity in our theories. It is *a letter* but it is also a *process* that processes a consonant realization of a letter.

word[35]. This distinction between Western phonology and ALT in terms of how the main phonological units are conceptualized, if one does not make caution, would make serious mistakes when adopting any generalization or conclusion of the other field. For instance, the root in Arabic is introduced in Western phonology as a consonantal root, (i.e., it lacks any vowel). I have the impression that such idea is incorrect translation for how ALT filed views the components of root, (i.e., letters). Nonetheless, this consonantal definition for the Arabic is wrong based on the establishments of Western linguistics. Moreover, since *letters* in ALT are not just consonants then claiming that the root in Arabic is consonantal is wrong even based on ALT establishments.

What I consider a mistake that is resulted from misunderstanding the significant differences between the natures of phonological units of the two fields appears in McCarthy (1979/1985: 243). He claims that 'Forms with initial clusters, if not preceded by a vowel in the phrase, receive epenthetic ʔV.' This I consider a clear translation for the term *letter* of ALT as a *consonant* of Western phonology because McCarthy within this statement is translating the core of what *can be termed* as نظرية الساكن "the theory of Alsaakin". This theory is well known in the morphology field of study in ALT tradition. It is beyond the scope here to delve in its detail. However, it basically assumes that *two Saakin letters are prohibited in Arabic,* hence, an insertion of the epenthetic letter, (i.e., *Hamzat Alwasil*) is implemented to satisfy this requirement. This *Hamzat Alwasil* is the critical issue in terms of how McCarthy has introduced this letter to Western phonology. Next, I illustrate the mistake.

In ALT we treat this letter as an epenthetic glottal stop processed by a vowel. I assume that this theoretical treatment is because a vowel is not recognized as **unit**. The underlying representation of this letter that is recognized is a complex issue. Some assume that this letter, underlyingly, is ساكن *Saakin* others assume that it مكسور *Maksuur*. However, both of groups agree that in the surface it is a *voweld letter* and that it is epenthetic. The early grammarians give another note regarding this claimed epenthetic letter. They confine its occurrences to the verbs but other types of words are mentioned (see more detail of this claimed epenthetic letter as viewed by the early grammarians in Alkhatiib, 2011: 33- 110).

McCarthy (1979/1985: 243) introduces the component of *Hamzat Alwasil letter* as the epenthetic syllable ʔV, hence, he adopts the grammarians' establishment. I argue that this adopt is a mistake considering the establishments of Western phonology and the essence of the claimed epenthetic syllable ʔV.

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[35] In the field of Tajwiid which is concerned of the Qur'anic readings you would find that they are interested of the differences that do not lead to different meaning.

To explain, the V is a variable segment that varies in words but the glottal stop is constant in all the realizations that surface this letter. Thus, considering that the grammarians do not recognize a vowel as a unit there is a good possibility that they interpreted an initial variable vowel as part of a letter. Since they continually perceived a preceding glottal stop that precedes this variable vowel, then the possibility increases. I argue that the initial variable vowel is part of the underlying input of a stem; hence it is not epenthetic. I also argue that the preceding glottal stop that is not epenthetic either; rather, it is a glottal stop that is losing its phonemic state word-initially. Two substantiations support these arguments. The first is that when transcribing a word that has *Hamzat Alwasil* utilizing the IPA, the absence of the glottal stop will not affect the ability to realize the word if the vowel is transcribed, but if the vowel is not transcribed this will put those who understand Arabic in difficulty to recognize the word. As an example of what I am saying, consider the formation of the Arabic imperative verb which generally manifests an initial *Hamzat Alwasil.* The need to transcribe the vowel is essential since it varies /i/ or /u/ as can be seen from *iqraʔ* "read.MASC.Sing", *ilʕab* "play.MASC.Sing" and *uktub* "write.MASC.Sing". Recall that this is a variation of forming the imperative verb in the classical era, and that this variation is standardized. Other classical variation of the imperative is that these vowels appear between the consonantal clusters, (examples provided in chapter four when discussing the analogy in section 4.4.1.2). On the other hand, the reason that made the grammarians introduce *Hamzat Alwasil* as an epenthetic letter in contrast to همزة القطع *Hamzat Alqatˤʕ*, which is initial non-epenthetic glottal stop *letter* appears in many words in the classical era, is the detectable difference between the two. Those who know SA and MSA perceive the distinct phonological behaviour of the two letters. This difference is that the first gets deleted when being preceded whereas the latter does not.

The second substantiation is that همزة القطع *Hamzat Alqatˤʕ* is indeed behaving in the dialectal modern era exactly like the claimed epenthetic *Hamzat Alwasil*, (i.e., it gets deleted when being preceded). Thus, I argue that *Hamzat Alwasil*, should not be treated as a process of *prosthesis* in Western phonology, instead it should be treated as a process of sound change as in my view such treatment would be compatible with the Western theoretical establishments.

Therefore, the issue in my opinion is related to the state of the glottal stop which was in the classical era starting to lose its legitimacy as a phoneme. Personally, I think that *Hamzat Alwasil* is not epenthetic in its both segmental components, (i.e., the consonantal and the vocalic). Rather, I think that *the constraint ONSET is losing in a **very slow motion** its*

position in the hierarchy as an undominated constraint in Arabic. I also think that *the glottal stop is becoming something less than a phoneme in Arabic*. These premises are worth of investigation. Nonetheless, the main point is that more consideration for theoretical differences between the two fields should be made.

6.5 Cultural issues

I *feel* that I am obliged to highlight that there is a need to show more considerations for *cultural issues* that may be missed when writing a paper. A researcher may offend people because of mistakes that could have been avoided. I will not talk about all what I found, rather I mention here only the most offended one for any true Muslim believer, and hence cannot be ignored. McCarthy (1981: 378) translates two words that have religious meaning wrong translations. The verb 'kabbar' is introduced as the 'Derived Form' of what has been termed as the 'Derivational Source', (i.e., 'ʔalaahu ʔakbar'). The translation that was offered for the verb is 'say battle-cry', whereas the claimed derivational source is translated as 'Allah is great'. Obviously for any native Arabic, neither the transcriptions nor the translations are correct. To explain, the derivational source should have been transcribed as [ʔalˤlˤaahu ʔakbar] which means "Allah is the greatest"[36]. As for the verb, if imperative, as the translation seems to indicate, then it is supposed to be transcribed as [kabbir]. The verbal transcription is for masculine singular as I assume its McCarthy's intention. Nonetheless, it means for the imperative "say Allah is the greatest" as the word *ʔakbar* is a superlative form. As mentioned the mistake is highly offensive. The sentence [ʔalˤlˤaahu ʔakbar] is the first sentence in the call for the praying which is termed as أذان *ʔaðaan* in the Islamic faith. This call for pray is daily and in five distinct periods of time. However, THE GOD ﷻ says in verse 12 in Chapter ʔal-ħuʒuraat (49):

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا اجْتَنِبُوا كَثِيرًا مِّنَ الظَّنِّ إِنَّ بَعْضَ الظَّنِّ إِثْمٌ﴾

Pickthall's (2006: chapter 49, verse: 12, p. 568) suggested English translation of the Qur'an is "O ye who believe! Shun much suspicion; for lo! some suspicion is a crime".

Thus, since THE GOD ﷻ commands that in similar situations we should be fair warning us that HE ﷻ is aware of what we do, I looked at McCarthy's works about Arabic. Thus, upon checking the references list of McCarthy's (1979/1985; 1979; 1980; 1981; 1983; 1988; 1994; 2004; 2005; 2011), which are all papers that have approached the Arabic language within different breadth, I found that he never used a source written in Arabic

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[36] If the phrase occurs in a context of a comparison the translation can be "Allah is greater than…".

language. This makes me assume that he is not a second learner of Arabic language even though he theoretically knows a lot about this language. Finding other mistakes in his works supported this impression. Accordingly, I assume that his mistake that is mentioned above is made unintentionally. However, since the mistake is really serious and causes offence to Muslims all over the world, I demand that he takes an action so that we do not feel that we are offended.

6.6 ALT and Western phonology

In this section, I bring the attention to specific issues for those who work in the field of ALT tradition. Students of ALT have been sent to study Western linguistics since the 19th century as far as I know. We really need to be critical towards what we really need and want from sending the students to Western universities to learn the Western theories. The differences between these theories and our own understanding for language in general and the Arabic language in particular need to be taken with high caution. I call for a systematic process of assessing what these students have established after finishing their studies so that we can make studied plans for the future of research. The progress in our own research has to have a priority. Thus, the Western theories and ideas of approaching language should be critically evaluated in terms of what they really have contributed towards understanding the Arabic language in contrast to our own establishments.

In addition, studying the Arabic language change has to be a goal among ALT grammarians whether we adopt the Western theories or not. I argue that this is an issue that should be taken with more brave steps to grant the progress of research. The main problems that are going to face us is developing theoretical framework that can express the generalizations that are established. This step needs to be solved in a systematic way by shovelling first our own theories. The process of translating the Western theories to Arabic to introduce it to the field needs to be studied in terms of the consequences. The architecture of stratal OT, for instance which has been used as an expressive framework in this study, is highly straightforward in terms of its ability to account for the different phenomena. However, the constraints are needed to be thought of with high caution since as has been explained in 6.4 they are based on different measurable units and even though we know these units but the cost of adopting different measurable units is high in terms of time and efforts. In addition, the privileges of building a framework based on our own measurable unites are highly tempting. These include (i) enhancing our own understanding for our theories and others theories, (ii) sifting our sources and (iii) increasing the cooperative work between ALT grammarians/researchers.

Care also should be taken regarding the effects of adopting the Western theories on supporting hypotheses and ideas that *may* contradict the Islamic faith. Personally, I faced this problem. To explain, too much of readings are needed to comprehend the definitions that are behind a theory but I do not have adequate time to examine them in terms the Islamic position of these ideas and hypothesis.

Finally, it is observed that a non-literate native Arabic speaker is capable to understand the Qur'an, a holy text of the seventh century, even though he/she has not undergone study to learn the standardized language. This study has argued that the change in the Arabic language is fixed so that new words remain similar to the old words. The advantage of keeping the change within the domain of phonological similarities is that the semantic components of words are not hard to be recognized. Thus, I conclude that the selection of the Arabic language as the language of the last revealed message from THE GOD ﷻ to humans is linguistically motivated. In fact, I argue that it is not accidental that all the holy texts of the Ibrahimian religions that we know are revealed in a language that belongs to the Semitic family. Linguistically the members of this family are argued to activate the proto-inherited property of generating highly similar words. The contrast between Hebrew and Arabic in chapter five displays that even though the two sisters separated centuries ago but they still hold high similarity for two distinct languages.

Therefore, based on this recognition for this property within these languages I introduce this argument. That the holy texts are revealed within a Semitic language is because the message in the text will be understood for a long period of time due to how the internal system of these languages are monitoring language change. That the holy texts were always intended to remain unchanged by THE GOD ﷻ make ones think of the meanings of HIS two holy names, (i.e., The Entirely Merciful and the Especially Merciful) in a different sense. These holy names generally thought of in terms of the amount of mercies that are possessed by THE GOD ﷻ and given by HIM to creatures. However, *how* mercies are given by THE GOD ﷻ to HIS creatures should be reasoned and thought of. That HE knows that HIS message will remain understandable if the message was revealed in Arabic and chooses, thus, the Arabic language for HIS last message is a mercy. That HE has maintained revealing HIS messages within a human language that shapes similarities to signal lexical relations is a mercy. Creating such language within the diversity and multitude of languages is a mercy. Humans' ability to communicate within the created diversity and multitude of languages is a mercy. Creating humans with abilities and needs so that they communicate is a mercy. Thus,

if ones watch observantly how mercies are surrounding us a more accurate understanding for the holy names The Entirely Merciful and the Especially Merciful can be reached.

On the other hand, such findings about how fixed our world and the life we live cannot make us stop glorifying THE GOD ﷻ who prepared everything for us. Being thankful to THE GOD ﷻ through worshiping HIM the way HE commands should be a human goal in his/her life.

6.7 The limitations of this study

There are several limitations that need to be taken in consideration. Firstly, I am not a phonetician nor I can claim that I underwent a focus programme in studying phonetics. Thus, the transcription of the collected data should be viewed with some care. Yet, I am confident that the consonants are transcribed with good accuracy. I also have confidence in terms of the segmental structure. My concern is mainly centred on the quality of the vowels to some extent. Thus, even though the appendixes offer valuable corpora of Arabic data that are collected on systematic criteria, for those who are interested with the quality of vowels I advise them to check the modern data in particular MMA.

Secondly, I have discovered, by coincidence, when consulting Reynolds (2008) that there is another Qur'anic dictionary. This dictionary can be, respectively, considered modern as its volumes were published in the 1980s. It is collected by Makram and Aumar (1982; 1983; 1984; 1985). Thus, it would have been better if the investigation included the Qur'anic readings that appear in this dictionary as well. Unfortunately, the time in which I have discovered the dictionary was too late.

I cannot claim that I am the best analyst but chapter five offers an attempt that I hope that it is worth of being considered by others.

The modern Arabic dialect	Country	Stem-forms	Inflected-forms	Comments about the raw data	References
Upper Egypt south of Asyut	Egypt	[kalb] "dog" [baħ*a*r] "sea"		Watson[2] provided these data as examples that sustain the generalization: 'Depending on the dialect, VC dialects[1] either permit no –CC clusters, or permit them only with falling sonority'.	Watson[2] (2007: 339).
Cairene Arabic	Egypt		[binˈt*i*na] "our daughter"	This example is used as an evidence that 'In CV dialects[3], epenthetic vowels are always visible to lexical processes, and are stressed under the same conditions as regular vowels'.	Watson (2007: 340).
Sˤanʕani	Yemen		[bint*a*naa] "our daughter" [ahl*a*haa] "her family"	The examples are provided as an evidence that this is 'a dialect in which derived CCC clusters are typically epenthesised as CCVC'	Watson (2007: 341).
Central Urban Sudanese	Sudan		[dʒambana] "beside us"[4] [bank*a*na] "our bank" [ˈkalb*a*na] ~[kaˈlibna] "our dog" [iˈsmna] ~[ˈism*a*na] "our name"	The following examples are provided with the claim that this dialect 'allows limited number of final –CC clusters optionally'.	Watson 2007: 341, 342 citing Dickins, in preparation).
Shukriyya	Sudan		[kalb*a*na], and less common	Even though Watson alluded that	Watson (2007: 342),

[1] Watson (2007) appeared to be utilizing Kiparsky's terminology for the syllabification patterns. 'VC dialects split CCC by epenthesis to the left of the unsyllabified consonant' (Watson; 2007: 337).

[2] The *italic* and **boldfaced** of the epenthetic vowel is my own addition to Watson's (2007) transcriptions in all her data that appear in this Appendix.

[3] These type of dialects 'split CCC to the right of the unsyllabified consonant' (Watson; 2007: 337).

[4] I have considered this word as a nominal word even though that it does behave as a functional element based on my experience as an ALT grammarian.

			[kaˈlibna] "our dog" [milħakum] "your.Pl salt" [ɣulbahin] "their misery"	there are some differences, she declared that this dialect 'is similar to Central Urban Sudanese'. Briefly she mentioned the following differences: -'VC-epenthesis patterns in noun and verb suffixation are less common than CV-patterns' -She noted that her source provides 'other example of epenthesis in suffixed nouns are all of the CV-type'. -'the dialect displays exceptionalness 'metathesis' of medial –CCiC- to –CiCC- in verb forms with vowel-initial suffixes".	citing Reichmuth 1983.
Yaafiʻi	Yemen		[raashaa] 'her head'	This is one of Watson's examples in which she was claiming that "Non-final CVVC syllables are far more common in CV dialects, however, than Kiparsky's analysis would suggest". By Kiparsky's analysis she was referring to Kiparsky (2003).	Watson (2004: 343), Citing Vanhove 2004.
Al-Hudida	Yemen	[l-ħabs] "the prison"		Watson provided this example as an evidence that this dialect is placed within the CV dialect set. In that, even though it has unrestricted final –CC, epenthesis is witnessed in this dialect. I only documented the example that concern this study, because the	Watson (2007: 344), citing Rossi 1938.

				other examples which Watson provides were not considered nominal . In that, [ʕindahaa] 'with her', [ʕindamaa] 'when' & [taħt] 'beneath' are considered functional words, whereas the word [dʒibtalak] 'I gave you (MASC SG) is considered a verb.	
Mecca	Saudi Arabia	[ħilm] "dream"	[dʒambana] "beside us" [ʔibin] "son" [ʔibnu] "his son" [tamur] "date" [tamru] "date"	These examples were provided to sustain that this dialect ' is a CV dialect from its epenthesis patterns'. She declared that surfacing consonantal sequence – CC with raising sonority is not allowed. She pointed that the sequence would be avoided by a vowel insertion when the final consonant in the sequence is /m n r l ɣ/. Citing Ingham 1971:282, she pointed out that the only exception is the sequence /lm/.	Watson (2007: 347), citing Ingham 1971.
Tripoli	Libya	[xubznz] "our bread" [bintna] "our daughter" [təldʒ] "snow" [kəlb] "dog" [xubz] "bread" [batˤn] "belly" [kelbkem] "your.Pl dog"	[xubəz] "bread" [wudən] "ear"	-Watson informs that based in her information, this dialect appears to belong to the group of VC dialects. She justifies this classification for the dialect on the bases that 'it has restrictions on medial and final consonant clusters...; however, concatenation of a CVCC noun with a consonant-initial suffix does not result in epenthesis, but in surfacing of non-final CVCC	Watson (2007: 345), citing the sources -Christophe Pereira (Personal communication) - Yoda, 2005: 124, 120.

| | | | | syllables and hence medial CCC clusters". Watson continues her discussion in section 3.2.3 in her paper by explaining that in which she elaborates upon the role of sonority on surfacing –CC clusters in this dialect. Exemplifying with data she explained that this type of consonantal sequence appear whether the sonority was falling, equal, or rising. Furthermore, she informs that both epenthesised and non-epenthesised may be used by the same speaker. Citing Christophe Pereira (P.C.), Watson does not attribute the use to be geographical variants, rather a possibility for it to be stylistic variants is suggested. | |
| Palestinian Arabic | Palestine | Example for group1: ?ákil "food" fúrun "oven"

Example for group 2: dárs/dáris "lesson"

Example for group 3: ?úxt/*?úxut "sister" | Example for group 1[5]: ?ákl-i "my food" ?ákil-ha "her food" ?ákil-kum "your.Plr food" fúrn-i "my oven" fúrun-ha "her oven" Example for group 2: dárs-i "my lesson" dárs-ha/dáris-ha "her lesson" | Abu Salim(1980:2) informs that his data has revealed that there are 3 groups in terms of the vowel insertion in monosyllabic stems: -The –CC cluster would be broken in the majority of his data by a vowel insertion. He noted that the epenthetic vowel is usually /i/ but it may be /u/ if the stem underlyingly has this back round vowel. | Abu Salim (1980: 2). |

[5] The translations for the inflected-forms are my own suggestion since Abu Salim (1980) did not provide them.

			Example for group 3: ?úxt-i "my sister" ?úxt-ha/*?úx<u>ut</u>-ha "her sister"	-The –CC cluster is specific nouns appeared to have two realizations. In that it either surfaces or avoided by a vowel insertion /i/. This resembled 10% of his data. - The –CC cluster would surface in this dialect in a relatively small number of adjectives and nouns.	
Moroccan Arabic	Morocco	This CA[6] stem *šakl* "form", is either realized as *škel* or [ʃkl]. -Most dialects have the forms: š*ə*mš "sun" x*ŭ*bz "bread" -Tafilalt and oasis dialects šm*ə*š "sun" xb*ə*z "bread"		Heath (2002: 205, 206) states that 'CA strong trilateral stems of the shape *CvCC*- (with short V) are normally reflected as MA *CəCC*. However, when C_3 is a sonorant and is not lower than C_2 on the sonority hierarchy…, we get *CəCC*[7]. Furthermore, he points out that the schwa *ə* is not often realized in many dialects of Jewish and Muslims in such types of monosyllabic stems. Furthermore, he informed that as far as he knows there are no dialects that 'has merged all instances of *CəCC* to *CCəC* when the last two C's are	Heath (2002)[8].

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[6] I am not sure of how exactly Heath (2002) defines this term. However, it may be that he thinks of CA and Koiné are equivalent in particular that in page 8 the terms 'modern Koiné' and the term 'Moroccan Koiné' appear. Even though he does not define any of these terminologies, I think that he probably views the term Koiné as a form of a standardized language form. His transcription for what he attributes to CA sustained this. However, in p. 205 the term Koiné and the term CA appear in the same context in a way that confused me. That said, I am not trained to use the transcription system which heath (2002) utilizes to transcript the data, nor do I claim that my reading for the book was deep.

[7] The term strong 'trilateral stems' is another terminology for what this study is concerned with.

[8] I do not provide the pages in which I extracted the data because I scanned the whole book.

				obstruent's'.	
Iraqi Arabic (Baghdadi Muslim)	Iraq	[ʔibni] "my son" beet "house"	[ʔibin] "son" [ʔibinna] "our son" beetna "our house"	These examples were provided by Broselow (1992:12) to illustrate the generalization that there are modern Arabic dialects that employ epenthesis to resolve only in CVCC+C sequences but not when 'a long vowel followed by two consonants'[9].	Broselow (1992: 12), citing Erwin (1963).

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[9] The example which Broselow (1992:12) has provided for the 'long vowel followed by two consonants' is incompatible. Broselow's example is: *daftar* 'notebook', *dafterna* 'our notebook'.

This appendix presents the classical data. It contains three tables. Each one of these tables presents the results of searching twenty nominal stems from the Qur'anic readings in Alkhatiib's (2002) dictionary. Table1 presents the structures of CaCC underlying sequence, table 2 presents the structures of CuCC underlying sequence, and table 3 presents the structures of CiCC underlying sequence. Each table of them consists of four main columns, and 21 rows. Each row consists of one of the twenty investigated stems with the exclusion for the first row which introduces the columns. The first column specifies the stem and its gloss, whereas the second specifies the number of occurrences in the text of the holy Qur'an. The third column specifies the positions in which the stem appears in the holy text. Accordingly, it is split into two cells. The Chapters number is in the first cell and the verse(s) number is in the second cell. Note that if the investigated stem appears in the same verse more than once I do not repeat the verse's number. The fourth column presents the phonological structure(s) that were obtained from Alkhatiib's (2002) dictionary and their gloss. Note that I transcribe a structure/realization only once even if it was repeated.

Table 1:

word	N	Chapters and verses		Structures
نَفْس "Self"	136	2	(48,123,233,281,72,130,207, 231,268)	[nafs-u-n] "a self.Nom"
		3	(25,30,161,185,28,30,93,145	[nafs-i-n] "a self.Gen"
		4	(1,4,79,84,110,111)	[nafs-a-n] "a self.Acc"
		5	(32,30,45,116)	[nafs-a-hu] "his self.Acc"
		6	(70,98,164,12,54,104, 151,152,158)	[nafs-i-hi] "his self.Gen"
				[li-nafs-i-n] "to a self.Gen"
		7	(42,188,189,205)	[nafs-i-k-a] "your.Sing.Masc self.Gen"
		9	(120)	[nafs-a-k-a] "your.Sing.Masc self.Acc"
		10	(30,15,49,54,100,108)	[nafs-u-hu] "his self.Nom"
		11	(105)	[ʔan-nafs-a] "The slef.Acc"
		12	(68,23,26,30,32,51,53, 54,77)	[bi-n-nafs-i] "in the self.Gen"
				[nafs-ii] "myself"
		13	(33,42)	[ʔa-nnafs-u] "The self.Nom"
		14	(51)	[fa-li-nafs-i-hi] "Then for himself.Gen"
		16	(111)	[li-nafs-ii] "to myself"
		17	(14,15,33)	[li-nafs-i-hi] "to himself.Gen"
		18	(6,28,35,274)	[nafs-i] "self.Gen"
		20	(15,40,41,67,96)	[bi-nafs-i-ka] "with your.Sing.Masc self.Gen"
		21	(35,47)	[ka-nafs-i-n] "as a self"
		29	(6,57)	[nafs-a-haa] "herself.Acc"
		23	(62)	[nafs-u-ka] "your.Sing.Masc self.Nom"
		25	(68)	
		26	(3)	
		27	(40,44,92)	
		28	(16,19,33)	
		31	(34,28)	
		32	(13,17)	
		36	(54)	
		33	(37,50)	
		34	(50)	
		35	(8,18,32)	
		37	(113)	
		39	(6,41,56,70)	

Word	Count	No.	References	Forms
		40	(17)	
		45	(22,15)	
		50	(16,21)	
		47	(38)	
		48	(10)	
		59	(9,18)	
		63	(11)	
		64	(16)	
		65	(1,7)	
		75	(2,14)	
		79	(40)	
		74	(38)	
		81	(14)	
		82	(5,19)	
		86	(4)	
		89	(27)	
		91	(7)	
		41	(46)	
وعد "promise"	45	3	(152)	[waʕd-a-hu] "his promise.Acc"
		4	(122)	[waʕd-a] "promise.Acc"
		9	(111)	[waʕd-a-n] "a promise.Acc"
		10	(4, 48, 55)	[ʔal-waʕd-u] "The promise.Nom"
		11	(45, 65)	[waʕd-a-k-a] "your.Sing.Masc promise.Acc"
		13	(31)	[waʕd-u-n] "a promise.Nom"
		14	(22,47)	[waʕd-u] "promise.Nom"
		16	(38)	[waʕd-i-hi] "his promise.Gen"
		17	(5,7,104,108)	[waʕd-u-hu] "his promise.Nom"
		18	(21,98)	[ʔal-waʕd-i] "The promise.Gen"
		19	(54,61)	[ʔal-waʕd-a] "The promise.Acc"
		20	(86)	
		21	(9,38,97,104)	
		22	(47)	
		25	(16)	
		27	(71)	
		28	(13,61)	
		30	(6,60)	
		31	(9,33)	
		34	(29)	
		35	(5)	
		36	(48)	
		39	(20,74)	
		40	(55,77)	
		45	(32)	
		46	(16,17)	
		67	(25)	
		73	(18)	
شَهْر "month"	12	2	(185,194,217)	[ʃahr-u] "month.Nom"
		5	(2,97)	[ʔaʃ-ʃahr-a] "The month.Acc"
		9	(36)	[ʔaʃ-ʃahr-u] "The month.Nom"
		34	(12)	[bi-ʃ-ʃahr-i] "in the month.Gen"
		46	(15)	[ʔaʃ-ʃahr-i] "The month.Gen"
		97	(3)	[ʃahr-a-n] "a month.Acc"
				[ʃahr-u-n] "a month.Nom"
				[ʃahr-i-n] "a month.Gen"
سَبْت "Saturday"	6	2	(65)	[ʔa-ssabt-i] "The saturday.Gen"
		4	(47,154)	[sabt-i-him] "Their saterday.Gen"
		7	(163)	[ʔas-sabt-u] "The saturday.Nom"
		27	(124)	[ʔas-sabt-a] "The saturday.Acc"
بَرْق "Lightning"	5	2	(19,20)	[barq-un] "a lightning"
		13	(12)	[ʔal-barq-u] "The lightning.Nom"
		24	(43)	[ʔal-barq-a] "The lightning.Acc"
		30	(24)	[barq-i-hi] "his lightning"
بَحْر "Sea"	33	2	(50,164)	[ʔal-baħr-a] "The sea.Acc"
		24	(40)	[ʔal-baħr-i] "The sea.Gen"
		5	(96)	[baħr-i-n] "a sea.Gen"
		6	(59,63,97)	[ʔal-baħr-u] "The sea.Nom"
		7	(138,163)	
		10	(22,90)	
		14	(32)	
		16	(14)	
		17	(66,67,70)	
		18	(61,63,79,109)	
		20	(77)	
		22	(65)	

		26	(63)	
		27	(63)	
		30	(41)	
		31	(31,27)	
		42	(32)	
		44	(24)	
		45	(12)	
		52	(6)	
		55	(24)	
زَوْج "Spouse"	17	4	(20,1)	[zawʒ-i-n] "a spouse.Gen"
		22	(5)	[zawʒ-a-haa] "her spouse.Acc"
		26	(7)	[zawʒ-u-k-a] "your.Sing.Masc spouse.Nom"
		31	(10)	[zawʒ-i-hi] "his spouse.Gen"
		50	(7)	[zawʒ-a-n] "a spouse.Acc"
		2	(35,102,230)	[li-zawʒ-i-k-a] "your.Sing.Masc spouse.Gen"
		7	(19,189)	[zawʒ-a-hu] "his spouse.Acc"
		20	(117)	[zawʒ-a-k-a] "your.Sing.Masc spouse.Acc"
		21	(90)	[zawʒ-i-haa] "her spouse.Gen"
		33	(37)	
		39	(6)	
		58	(1)	
وَجْه "Face"	36	2	(115,272,112,144,149,150)	[waʒh-u] "Face.Nom"
		3	(20,72)	[waʒh-a-hu] "his face.Acc"
		4	(125)	[waʒh-i] "Face.Gen"
		5	(108)	[waʒh-a-k-a] "your.Sing.Masc face.Acc"
		6	(52,79)	[waʒh-i-k-a] "your.Sing.Masc face.Gen"
		10	(105)	[waʒh-a] "Face.Acc"
		12	(9,93,96)	[waʒh-ii]≈[waʒh-i-ja] "my face"
		13	(22)	[waʒh-i-haa] "her face.Gen"
		16	(58)	[waʒh-i-hi] "his face.Gen"
		18	(28)	[waʒh-u-hu] "his face.Nom"
		22	(11)	[bi-waʒh-i-hi] "in his face.Gen"
		28	(88)	[waʒh-a-haa] "her face.Acc"
		30	(38,39,30,43)	[li-waʒh-i] "for face.Gen"
		31	(22)	
		39	(24)	
		43	(17)	
		51	(29)	
		67	(22)	
		55	(27)	
		76	(9)	
		92	(20)	
غَلَي "Boiling"	1	44	(46)	[ka-ɣalj-i] "as boiling.Gen"
زَرْع "Crop"	8	6	(141)	[ʔaz-zarʕ-a] "The crop.Acc"
		14	(37)	[zarʕ-u-n] "a crop.Nom"
		13	(4)	
		16	(11)	
		18	(32)	
		32	(27)	
		39	(21)	
		48	(29)	
حَرْف "Edge"	1	22	(11)	[ħarf-i-n] "an edge.Gen"
رَعْد "Thunder"	2	2	(19)	[raʕd-u-n] "a thunder.Nom"
		13	(13)	[ʔa-rraʕd-u] "The thunder.Nom"
كَلْب "Dog"	5	7	(176)	[ʔal-kalb-i] "The dog.Gen"
		18	(18,22)	[kalb-u-hum] "their.Masc dog.Nom"
لَحْم "Meat"	11	2	(173,259)	[laħm-a] "meat.Acc"
		6	(145)	[laħm-a-n] "a meat.Acc"
		5	(3)	[laħm-u] "meat.Nom"
		16	(14,115)	[laħm-i-n] "a meat.Gen"
		23	(14)	[laħm-i] "meat.Gen"
		49	(12)	
		35	(12)	
		52	(22)	
		59	(21)	

فَضْل "Bounty"	73	2 3 4 5: 7 8 9 10 11 12 16 17 24 27 28 30 35 40 42 45 57 62 73	(64,90,105,237,243,251) (73,74,152,170,171,174,174,180) (32,37,54,70,73,83,113,173,175) (54) (39) (29) (28,59,74,75,76) (58,60,107) (3) (38) (14) (66,87) (10,14,20,21,22,32,33,38) (16,22,73) 28:73:11) (23,45,46) (30,32,35) (61) (42:22:23) (42:26:8) (12) (21,29) (4,10) (20)	[fadˤl-u] "bounty.Nom" [fadˤl-i] "bounty.Gen" [fadˤl-i-hi] "his bounty.Gen" [fadˤl-a-hu] "his bounty.Acc" [fadˤl-u-n] "a bounty.Nom" [fadˤl-i-n] "a bounty.Gen" [bi-fadˤl-i-n] "in bounty.Gen" [ʔal-fadˤl-u] "The bounty.Nom" [ʔal-fadˤl-i] "The bounty.Gen" [ʔal-fadˤl-a] "The bounty.Acc" [li-fadˤl-i-hi] "to his bounty.Gen"
رَأس "Head"	7	2 7 12 19 20 44	(196) (150) (36,41) (4) (94) (48)	[ʔar-raʔs-u]≈[ʔar-raas-u] "The head.Nom" [raʔs-i-hi]≈[raas-i-hi] "his head.Gen" [bi-raʔs-i]≈[bi-raas-i] "by head.Gen" [raʔs-ii]≈[raas-ii] "my head" [bi-raʔs-ii]≈[bi-raas-ii] "by my head" The pausal forms: [ʔar-raʔs-u]→[ʔar-raʔs],[ʔar-raas] [raʔs-i-hi]→[raʔs-i-h], [raas-i-h] [bi-raʔs-i]→[bi-raʔs], [bi-raas] [raʔs-ii]→[raʔs-ii], [raas-ii] [bi-raʔs-ii]→[bi-raʔs-ii], [bi-raas-ii] [ʔar-raas-u]→[ʔar-raas] [raas-i-hi]→[raas-i-h] [bi-raas-i]→[bi-raas] [raas-ii]→[raas-ii] [bi-raas-ii]→[bi-raas-ii]
قَلْب "Heart"	19	2 3 8 16 18 26 28 33 37 42 45 40 50 64	(97,204,260,283) (159) (24) (106) (28) (89,194) (10) (32) (84) (24) (23) (35) (33,37) (11)	[qalb-i-k-a] "your.Sing.Masc heart.Gen" [qalb-i-hi] "his heart.Gen" [qalb-ii] "my heart" [qalb-u-hu] "his heart.Nom" [qalb-a-hu] "his heart.Acc" [ʔal-qalb-i] "The heart.Gen" [qalb-i] "heart.Gen" [qalb-un] "a heart.Nom" [bi-qalb-in] "in a heart.Gen" [qalb-i-haa] "her heart.Gen"
شَر "evil"	26	2 3 5 8 10 12 17 19 21 22 25 38 41 70 72 76 98 113 114	(216) (180) (60) (22,55) (11) (77) (11,83) (75) (35) (72) (34) (55) (49,51) (20) (10) (7,11) (98:6:15) (2,3,4,5) (4)	[ʃarr-un] " an evil.Nom" [bi-ʃarr-i-n] " of an evil.Gen" [ʃarr-a] "evil.Acc" [ʔaʃ-ʃarr-a] "The evil.Acc" [bi-ʃ-ʃarr-i] "of the evil.Gen" [la-ʃarr-a] "surly evil.Acc" [ʔaʃ-ʃarr-u] "The evil.Nom" [ʃarr-u-hu] "his evil.Nom" [ʃarr-i] "evil.Gen"

شيء "Thing"	278	2	(20,29,106,109,113,148,178,231,259,264,282,284,48,12,155,170,216,229,255)	Observations and notifications:
		3	(5,10,26,28,29,64,92,116,12,128,144,154,165,176,177,189)	-Alkhatiib documents that readers vary in terms of the length of the root vowel. Some pronounce it as المد المشبع "complete long vowel" whereas others pronounce it with توسط "half long". Note that these two descriptions are for the root vowel which is underlyingly short.
		4	(4,19,20,32,36,33,59,85,86,113,126,176)	
		5	(17,19,40,41,42,68,94,97,104,117,120)	-I found a mistake made by Alkatiib in one position. This is in verse (20) in Chapter (2). He is found providing 'شائ' [ʃaajʔ] as an articulation and attributing it to ابن مسعود Ibn Masʕuud ﷺ. However, when checking his cited source, I found that the spelling is not for an articulation rather it is for how this word appears transcribed in the *Musʕhaf* that belongs to ابن مسعود Ibn Masʕuud ﷺ. Ibn Masʕuud ﷺ is a well-known companion of the Prophet ﷺ. As for the Arabic transcription 'شائ' I have noticed that this transcription also appears in the Uthmaanic outline, which is the first official outline that is used to transcribe the holy text, in verse (23) in Chapter (18) ʔal-kahf. Upon a brief search around this issue, I found that this transcription in the Uthmaanic outline is observed by some. The opinion that I agree with is that it is a trace for old practice in transcribing this word which the Uthmaanic preserves in only the one specified verse. What asserts this opinion is that the transcription 'شائ' in contrast to 'شيء' is found in other *Musʕhafs* that belong to other companions. Nonetheless, as far as Hafsˤ ʕan ʕaasˤim Qur'anic reading form, the articulation for both transcriptions do not display any significance.
		6	(17,19,38,44,52,69,80,91,93,99,101,102,111,148,151,154,159,164)	
		7	(89,145,156,185,191)	
		8	(19,41,60,72,75)	
		9	(4,25,39,115)	
		10	(63,44)	
		11	(4,12,57,72,101)	
		13	(14,13,8)	
		12	(38,67,68,111)	
		14	(18,21,16)	
		15	(19,21)	
		16	(20,35,40,48,70,73,75,76,77,78,89)	
		17	(12,44,74)	-I found that Alkhatiib (2002) documents the following contextual form *[ʃajaʔ-a-n]*. This output is of interest because it shows an epenthetic vowel /a/ that is a copy of the lexical underlying vowel and the morpho-syntactical accusative marker. However, the problem is that Alkhatiib has mentioned this output attributing it to ابن عطية Ibn ʕatˤijjah only in one occurrence position from 278 occurrence positions of this stem. Therefore, I tried to access his cited source, (i.e., Ibn ʕatˤijjah's book) but I could not. I offer the name of the source mainly in Arabic because offering it within an IPA transcription is not helpful as far as my m experience:
		18	(23,33,45,54,70,71,74,76,84)	
		19	(9,27,42,60,67,89)	
		20	(50,98)	
		21	(30,47,66,81)	
		22	(1,6,5,17,26,73)	
		23	(88)	
		24	(35,39,45,55,64)	
		25	(2,3)	
		27	(23,88,91)	ابن عطية الأندلسي، المحرر الوجيز في تفسير الكتاب العزيز
		26	(30)	
		28	(57,60,88)	-The articulations which are transcribed in this cell are based on more than one source. Firstly, Alkhatiib's (2002) dictionary. Secondly, the consultation of the expert reader Anas Alkandari. Thirdly, listening to the articulations produced by different current readers.
		29	(12,20,62,42)	
		30	(40,50)	
		32	(7)	
		33	(27,40,52,54,55)	
		31	(33)	-As will be seen below, I boldfaced specific data. These are the contextual forms that display the phenomenon that is known in Arabic as السكت ʔal-sakt. I did not know the appropriate symbol that expresses this phenomenon within IPA. I express it by leaving two spaces between the glottal stop and the palatal /j/. Descriptively, this phenomenon is a brief pausing in the articulation of a word that has a glottal stop. Hence, a hearer hears a word that is split in its articulation. The reading form that is attributed to Ħamzah.
		34	(16,21,39,47)	
		35	(1,18,44)	
		36	(12,15,83,23,54,82)	
		38	(5,6)	
		39	(43,62)	
		40	(7,16,20,62,74)	
		41	(21,39,53,54)	
		42	(9,10,11,12,36)	The contextual forms:
		44	(41)	
		45	(9,10,19)	[ʃajʔ-u-n]≈**[ʃaj ʔ-u-n]**≈[ʃajj-u-n] "a thing.Nom"
		46	(8,25,26,33)	
		47	(32)	[la-ʃajʔ-u-n]≈**[la-ʃaj ʔ-u-n]**≈[la-ʃajj-u-n]
		48	(11,21,26)	"surly a thing.Nom"
		49	(16,14)	
		50	(2)	
		51	(42,49)	
		52	(21,35,46)	[ʃajʔ-i-n]≈**[ʃaj ʔ-i-n]**≈[ʃajj-i-n] "a thing.Gen"
		53	(26,28)	
		54	(6,52,49)	[bi-ʃajʔ-i-n]≈**[bi-ʃaj ʔ-i-n]**≈[bi-ʃajj-i-n] "is a thing.Gen"
		57	(2,3,29)	
		58	(6,7,18,10,17)	[li-ʃajʔ-i-n]≈**[li-ʃaj ʔ-i-n]**≈[li-ʃajj-i-n] "for a thing.Gen"
		59	(6)	
		60	(4,11,12)	
		64	(1,11)	
		65	(3,12)	[ʃajʔ-a-n]≈**[ʃaj ʔ-a-n]**≈[ʃajj-a-n]≈[ʃaj-a-n]≈[ʃaja ʔ-a-n]
		66	(8,10)	"a thing.Acc".
		67	(1,9,19)	
		72	(28)	
		78	(29)	
		80	(18)	
		85	(9)	
		76	(64)	
		82	(19)	

				The pausal forms: Acc: [ʃajʔ-a-n]→[ʃajʔ-aa] Nom: [ʃajj-u-n]→[ʃajj] ≈[ʃajj-uᴿ]≈[ʃajj-uˋ] Gen: [ʃajj-i-n]→[ʃajj]≈[ʃajj-iᴿ] Acc: [ʃajj-a-n]→[ʃajj-aa] Nom: **[ʃaj ʔ-u-n]**→[ʃaj]≈[ʃaj-uᴿ]≈[ʃaj-uˋ]≈ [ʃajj-uˋ]≈[ʃajj]≈[ʃajᴿ]. Gen: **[ʃaj ʔ-i-n]**→[ʃaj]≈[ʃaj-iᴿ]≈ [ʃajj-iᴿ]≈[ʃajj] Acc: **[ʃaj ʔ-a-n]**→[ʃaj-aa]≈[ʃajj-aa]
أرْض "Earth"	459	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	(11,22,27,29,30,36,60,61,71, 107,116,117,164,168,205, 251,255,267,273,284) (5,29,83,91,109,129,133,137, 156,180,189,190,191) (42,97,100,101,126,131,132, 170,171) (17,18,21,26,31,32,33,36,40, 64,97,106,120) (1,3,6,11,12,14,35,38,59,71,7 3,75,79,101,116,165) (10,24,54,56,73,74,85,96,100 ,110,127,128,129,137,146,15 8, 168,176,185,187) (26,63,67,73) (2,25,36,38,74,116,118) (3,6,14,18,23,24,31,54,55,61, 66,68,78,83,99,101) (6,7,20,44,61,64,85,107,108, 116,123) (9,21,55,56,73,80,101,105, 109) (3,4,15,16,17,18,25,31,33,41) (2,8,10,13,14,19,26,32,38,48) (19,39,85) (3,13,15,36,45,49,52,65,73, 77) (4,37,44,55,76,90,95,99,102, 103.104) (7,14,26,45,47,51,84,94) (40,65,90,93) (4,6,53,57,63) (4,16,19,21,30,31,4,56,71,81, 105) (5,18,41,46,63,64,65,70) (18,71,79,84,112) (35,41,42,55,57,64) (2,6,59,63) (7,24,35,152,183) (25,48,60,61,62,64,65,69,75, 82,87) (4,5,6,19,39,57,77,81,83) (20,22,36,39,40,44,52,56,61 ,63) (3,8,9,18,19,22,24,25,26,27,4 2,50) (10,16,18,20,25,26,27,34) (4,5,10,27) (27,72) (1,2,3,9,14,22,24) (1,3,9,38,39,40,41,43,44) (33,36,81) (5) (10,26,27,28,66) (5,10,21,38,44,46,47,63,67,6 8,69,74) (21,26,29,57,64,75,82) (9,11,15,39) (4,5,11,27,29,31,42,49,53) (9,10,60,82,84,85)	[ʔal-ʔardˤ-i]　　　　"The earth.Gen" [ʔal-ʔardˤ-u]　　　　"The earth.Nom" [ʔal-ʔardˤ-a]　　　　"The earth.Acc" [ʔardˤ-u]　　　　"earth.Nom" [ʔardˤ-i]　　　　"earth.Gen" [ʔardˤ-i-kum]　　　"your.plur earth.Gen" [ʔardˤ-i-naa]　　　"our earth.Gen" [ʔardˤ-ii]≈ [ʔardˤ-ija]　"my earth" [ʔardˤ-i-n]　　　　"an earth.Gen" [ʔardˤ-a-hum]　"their earth.Acc" [ʔardˤ-a-n]　　"an earth.Acc" Observe that even though the initial-glottal stop is transcribed in the realizations above but in Alkhatiib's dictionary it was found that surfacing it differs in the Qur'anic readings. The glottal stop realization in this stem seems to be depending on the context of realization. The number of occurrence of the stem in holy text does not attempt to investigate the realization of the glottal stop in particle that it is an initial-glottal stop. Thus, since the glottal is not part of the final consonant cluster in the stem, how it surfaces is not real significance for this study. However, I document mainly the following example for an interested researcher: /ʔal-ʔardˤ-i/→ [l-ardˤ-i]　　"the earth.Gen". Alkhatiib also mentions in only one position (2002: vol.1. p. 174) that Hamzah has two pausal forms for this word. The first exhibits السكت ʔal-sakt phenomenon whereas the second exhibits deletion for the glottal stop.

		44	(7, 29,38)	
		45	(3,5,13,22,27,36,37)	
		46	(3,4,20,32,33)	
		47	(10,22)	
		48	(4,7,14)	
		49	(16,18)	
		50	(4,7,38,44)	
		51	(20,23,48)	
		52	(36)	
		53	(31,32)	
		54	(12)	
		56	(4)	
		55	(10,29,33)	
		57	(1,2,4,5,10,17,21,22)	
		58	(7)	
		59	(1,24)	
		61	(1)	
		62	(1,10)	
		63	(7)	
		64	(1,3,4)	
		65	(12)	
		67	(15,16,24)	
		69	(14)	
		70	(14)	
		71	(17,19,26)	
		72	(10,12)	
		73	(14,20)	
		77	(25)	
		78	(6,37)	
		79	(30)	
		80	(26)	
		84	(3)	
		85	(9)	
		86	(12)	
		88	(20)	
		89	(21)	
		91	(6)	
		99	(1,2)	

Table1: The results of searching the 20 CaCC nominal stems and their paradigms

Table 2:

word	N	Chapters and verses		Structures	
أُخْت "Sister"	8	4	(12,23,176)	[ʔuxt-u-n]	"a sister.Nom"
		19	(28)	[ʔuxt-a]	"sister.Acc"
		7	(38)	[ʔal-ʔuxt-i]	"The sister.Gen"
		20	(40)	[ʔuxt-a-haa]	"her sister.Acc"
		28	(11)	[ʔuxt-u-k-a]	"your.Sing.Masc sister.Nom"
		43	(48)	[li-ʔuxt-i-hi]	"to his sister.Gen"
				[ʔuxt-i-haa]	"her sister.Gen"
جُزْء "Part"	3	2	(260)	[ʒuzʔ-u-n]≈[ʒuz*u*ʔ-u-n]≈[ʒuzz-u-n] "a part.Nom"	
		15	(44)		
		43	(15)	[ʒuzʔ-a-n]≈[ʒuz*u*ʔ-a-n]≈[ʒuzz-a-n]≈[ʒuz**u**w-a-n]≈ *[ʒuzV^G-a-n]* "a part.Acc".	
				The articulation [ʒuz**u**w-a-n] is classified as an articulation of a ʃawaað reading whereas *[ʒuzV^G-a-n]* is classified as dˤaʕiif "weak reading". The classification ʃawaað reading reduces the authenticity of the articulations in terms of the attribution to the seventh century. However, the classification dˤaʕiif "weak reading" means that the possibility is highly week for the articulation to belong to the seventh century. The pausal forms: NOM: [ʒuzʔ-u-n]→[ʒuzz]≈[ʒuzz-uˋ]≈[ʒuzz-u^R] ACC: [ʒuzʔ-a-n]→[ʒuzz-aa]	
مُلْك "dominion"	23	2	(102,107)	[mulk-i] "dominion.Gen"	
		3	(26,189)	[mulk-u] "dominion.Nom"	
		5	(17,18,40,120)		
		7	(158)		

		9	(116)	
		24	(42)	
		25	(2)	
		38	(10)	
		39	(44)	
		42	(49)	
		43	(51,85)	
		45	(27)	
		48	(14)	
		57	(2,5)	
		85	(9)	
بُخْل "Stinginess"	2	4 57	(37) (24)	[bi-l-buxl-i]≈[bi-l-bux**u**l-i]≈[bi-l-baxl-i]≈[bi-l-baxal-i]≈[bi-l-baxl-i]≈[bi-l-baxil-i]≈[bi-l-bixl-i]≈[bi-l-bixil-i] "in the stinginess.Gen"
رُكْن "Nook"	2	11 51	(80) (39)	[rukn-i-n]≈[ruk**u**n-i-n] "a nook.Gen" [bi-rukn-i-hi]≈ [bi-ruk**u**n-i-hi] "to his nook.Gen"
كُفْر "Disbelief"	37	2 33 31 35	(88,93,108) (44) (23) (39)	[kufr-u-hu] "his disbelief.Nom" [bi-kufr-i-him] "because of their disbelief.Gen" [ʔal-kufr-a] "The disbelief.Acc" [bi-l-kufr-i] "with the disbelief.Gen" [kufr-a-n] "a disbelief.Acc" [li-l-kufr-i] "to the disbelief.Gen" [ʔal-kufr-i] "The disbelief.Gen" [kufr-u-n] "a disbelief.Nom" [kufr-i-him] "their.Masc disbelieve" [bi-kufr-i-k-a] "for your.Sing.Masc disbelief"
ظَلْم "Injustice"	20	40 3 4 5 6 11 13 61 20 22 11 27 31 42	(17,31) (108) (10,30,153,160) (39) (82,131) (117) (6) (61) (111,112) (25) (4) (14) (13) (41)	[ðˤulm-a] "injustice.Acc" [ðˤulm-a-n]≈[ðˤul**u**m-a-n] "an injustice.Acc" [bi-ðˤulm-i-him] "because of their injustice.Gen" [fa-bi-ðˤulm-i-n] "for an injustice.Gen" [ðˤulm-i-hi] "his injustice.Gen" [bi-ðˤulm-i-n] "because of injustice.Gen" [ðˤulm-i-him] "their injustice.Gen" [la-ðˤulm-u-n] "surly an injustice.Nom"
شُكْر "Gratitude"	1	34	(13)	[ʃukr-a-n] "a gratitude.Acc"
كُرْه "Hate"	8	2 3 4 9 13 41 46	(216) (83) (19) (53) (15) (11) (15)	[kurh-u-n] "a hate.Nom" [kurh-a-n] "a hate.Acc"
عُرْف "Custom"	2	7 77	(199) (1)	[bi-l-ʕurf-i]≈[bi-l-ʕur**u**f-i] "by the custom.Gen" [ʕurf-a-n]≈[ʕur**u**f-a-n] "a custom.Acc"
رُعْب "Fright"	5	3 8 33 59 18	(151) (12) (26) (2) (18)	[ʔar-ruʕb-a]≈[ʔar-ruʕ**u**b-a] "The fright.Acc" [ruʕb-a-n]≈[ruʕ**u**b-a-n] "a fright.Acc"
دُهْن "Fat"	1	23	(20)	[bi-d-duh-n-i] "with the fat.Gen"
صُبْح "Morning"	6	11 74 81 100	(81) (34) (18) (3)	[ʔasˤ-sˤubħ-u]≈[ʔasˤ-sˤub**u**ħ-u] "The morning.Nom" [ʔasˤ-sˤubħ-i] "The morning.Gen" [sˤubħ-a-n] "a morning.Acc"
حُكْم "Judgment"	29	5 60 3 6 12 13 18 19 21	(43,50) (10) (79) (57,62,89) (22,40,67) (37,41) (26) (12) (74,78,79)	[ħukm-u] "judgment.Nom" [ʔal-ħukm-a] "The judgment.Acc" [ħukm-a-n]≈[ħuk**u**m-a-n] "a judgment.Acc" [ʔal-ħukm-u] "The judgment.Nom" [li-ħukm-i-hi] "for his judgment.Gen" [ħukm-i-hi] "his judgment.Gen" [li-ħukm-i-him] "for their judgment.Gen" [bi-ħukm-i-hi] "in his judgment.Gen" [li-ħukm-i-himaa] "for their.Masc.Dual

		26	(21,83)	judgment.Gen"	
		27	(78)	[fa-l-ħukm-u]	"then the judgment.Nom"
		28	(14,70,88)	[fa-ħukm-u-hu]	"then his judgment.Nom"
		40	(12)	[li-ħukm-i]	"for judgment.Gen"
		42	(10)		
		45	(16)		
		52	(48)		
		68	(48)		
		76	(24)		
عُذْر "Excuse"	2	18 77	(76) (6)	[ʕuðr-a-n]≈[ʕuður-a-n]	"an excuse.Acc"
صُلْح "Reconciliation"	2	4	(128)	[sˤulħ-a-n] [ʔasˤ-sˤulħ-u]	"a reconciliation.Acc" "The reconciliation.Nom"
وُسْع "Capability"	5	2 6 7 23	(233,286) (152) (42) (62)	[wusʕ-a-haa]	"her capability.Acc"
حُزْن "Grief"	5	9 12 28 35	(92) (84,86) (8) (34)	[ʔal-ħuzn-a]≈[ʔal-ħuzun-a]≈[ʔal-ħazan-a] "The grief.ACC" [ħuzn-ii]≈[ħuzun-ii]≈[ħazan-ii] "my grief" [ħazan-a-n]≈[ħuzn-a-n] "a grief.ACC" [ʔal-ħuzn-i]≈[ʔal-ħuzun-i]≈[ʔal-ħazan-i] "The grief.ACC"	

Alkhatiib documents two views about the structures [ʔal-ħuz*u*n-V] and [ʔal-ħazan-V]. The first view categorizes this difference to be لغة *lugah* "language". Hence, it views this difference as a dialectal difference. The second view categorizes it as قراءة *Qiraaʔah* "reading". Hence, it views this difference as a non-dialectal difference. The second view means that there is a possibility that the two distinct structures are different words that belong to the same word-family. By checking the Arabic dictionary, (i.e., Lisaan Al-Arab of Ibn Manðˤuur 630-711 AH /1232-1311 C.E.) it was found that the first view is the most probable. However, Ibn Manðˤuur documents that 'أبو عمرو ʔabuu ʕamruu says that the Arabs surface /a/ instead of /u/ when /ħuzn-V/ is marked with the accusative marker /a/ and that they Surface /u/ when / ħuzn-V/ is marked with the nominative /u/ and the genitive /i/ (see: Ibn Manðˤuur, 2003: vol.2. p. 429-430). I do not know who is ʔabuu ʕamruu. However, the information that he is giving is inconsistent with what appears in Alkhatiib's dictionary as can be seen from the data above. However, if ʔab**uu** ʕamruu is ʔab**ii** ʕamruu Ibn Alʕalaaʔ, then he might be explaining his reading form. The boldfaced in the two names is case marker. In Ibn Manðˤuur's dictionary the name was nominative, thus, I transcribed it as it appears in. However, I introduced the name of this Qur'anic reader in this thesis marked with the genitive (see chapter 2).

صُنْع "Work"	2	18 27	(104) (88)	[sˤunʕ-a-n] [sˤunʕ-a]	"a work.Acc" "work.Acc"
حُسْن "good"	13	2 3 13 18 27 29 33 38 42	(83) (14,148,195) (19) (86) (11) (8) (52) (40,25,49) (23)	[ħusn-a-n]≈[ħusun-a-n]≈[ħusn-ee] "a good.Acc" [ħusn-u] "good.Nom" [ħusn-a] "good.Acc" [la-ħusn-a] "surly good.Acc" [ħusn-u-hunna] "their.Plur.Fem good.Nom" Alkhatiib provided a pausal form that display h-insertion. [ħusn-u-hunna]→[ħusn-u-hunna*h*]	

Table2: The results of searching the 20 CuCC nominal stems and their paradigms

Table 3:

word	N	Chapters and verses	Structures
ضِعْف "Double"	6	7 (38) 17 (75) 34 (37) 38 (61)	[dˤiʕf-u-n] "a double.Nom" [dˤiʕf-a] "double.Acc" [dˤiʕf-a-n] "a double.Acc" [ʔadˤ-dˤiʕf-i] "The double.Gen" [ʔadˤ-dˤiʕf-u] "The double.Nom" [ʔadˤ-dˤiʕf-a] "The double.Acc"
صِدْق "Truth"	14	10 (2,93) 17 (80) 19 (50) 5 (119) 26 (84) 6 (115) 33 (8,24) 54 (55) 39 (32,33) 46 (16)	[sˤidq-i-n] "a truth" [sˤidq-u-hum] "their.Masc truth.Nom" [sˤidq-a-hum] "their.Masc truth.Acc" [sˤidq-a-n] "a truth.Acc" [sˤidq-i-him] "their.Masc truth.Gen" [bi-sˤidq-i-him] "for their.Masc truth.Gen" [bi-sˤ-sˤidq-i] "for the truth.Gen" [ʔasˤ-sˤidq-i] "the truth.Gen"
جِذْع "trunk"	2	19 (23,25)	[ʒiðʕ-i] "trunk.Gen" [bi-ʒiðʕ-i] "with trunk.Gen"
حِزْب "party"	8	5 (56,53) 30 (32) 58 (19,22) 35 (6)	[ħizb-a] "party.Acc" [ħizb-i-n] "a party.Gen" [ħizb-u] "party.Nom" [ħizb-a-hu] "his party.Nom"
مِسْك "Musk"	1	83 (26)	[misk-u-n] "a musk.Nom"
بِئْر "Well"	1	22 (45)	[biʔr-i-n]≈[biir-i-n] "a well.Gen" When pausing: [biʔr-i-n]→[biʔr],[biir] [biir-i-n]→[biir]
ذِئْب "Wolf"	3	12 (13,14,17)	[ʔað-ðiʔb-u]≈[ʔað-ðiib-u] "The wolf.Nom" When pausing: [ʔað-ðiʔb-u]→ [ʔað-ðiʔb]≈[ʔað-ðiib] [ʔað-ðiib-u]→ [ʔað-ðiib]
إِذْن "Permission"	39	10 (3,100) 2 (97,102,213,221,249,251,255) 3 (49,145,152,166) 4 (25,64) 5 (16,110) 7 (58) 8 (66) 11 (105) 13 (38)_ 14 (1,11,23,25) 22 (65) 33 (46) 34 (12) 35 (32) 40 (78) 42 (51) 58 (10) 59 (5) 64 (11) 97 (4)	[bi-ʔiðn-i-hi] "by his permission.Gen" [bi-ʔiðn-i] "by permition.Gen [bi-ʔiðn-ii] "by my permission" [fa-bi-ʔiðn-i] "then by permission.Gen" [ʔiðn-i-hi] "his permission.Gen" When pausing, the glottal stop either surfaces as [ʔ] or as an intermediate glottal stop (see chapter one for more details about this segment).
قِسْط "Justice"	15	21 (47) 3 (18,21) 4 (127,35,135) 5 (8,42) 6 (152) 7 (29) 10 (4,47,54) 11 (85) 55 (9) 57 (25)	[ʔal-qistˤ-a]≈[ʔal-qisˤtˤ-a] "The justice.Acc" [bi-ʔal-qistˤ-i]≈[bi-ʔal-qisˤtˤ-i] "with the justice.Gen"
عِجْل "Calf"	10	2 (51,54,92,93) 4 (153) 7 (148,152)	[ʔal-ʕiʒl-a] "The calf.Acc" [ʕiʒl-a-n] "a calf.Acc" [ʕiʒl-i-n] "a calf.Gen"

		11	(69)	
		20	(88)	
		51	(26)	
عِلْم "Knowledge"	105	2	(32,120,145,247,255)	[ʔal-ʕilm-i] "The knowledge.Gen"
		3	(7,18,19,61,66)	[ʔal-ʕilm-u] "The knowledge.Nom"
		4	(162,157,166)	[ʔal-ʕilm-a] "The knowledge.Acc"
		10	(39,93)	[ʕilm-a] "knowledge.Acc"
		13	(37,43)	[ʕilm-i-hi] "his knowledge.Gen"
		16	(25,27,70)	[ʕilm-u-n] "a knowledge.Nom"
		17	(85,107,36)	[ʕilm-i-n] "a knowledge.Gen"
		20	(43)	[bi-ʕilm-i] "with knowledge.Gen"
		22	(54,3,5,8,71)	[ʔal-ʕilm-i] "The knowledge.Gen"
		27	(42,15,40,66,84)	[ʕilm-a-n] "a knowledge.Acc"
		28	(80,14,78)	[bi-ʕilm-i-n] "with a knowledge.Gen"
		29	(8,49)	[ʕilm-u-humaa] "their.dual knowledge.Nom"
		30	(29,56)	[ʕilm-ii] "my knowledge"
		34	(6)	[ʕilm-u-hum] "their.Masc knowledge.Nom"
		40	(7,42,83)	[la-ʕilm-u-n] "surly knowledge.Nom"
		42	(14)	
		45	(17,23,24)	
		46	(4,23)	
		47	(16)	
		53	(30,28,35)	
		58	(11)	
		67	(26)	
		5	(109)	
		6	(80,100,108,119,140,143,144,148)	
		7	(7,52,89,187)	
		11	(14,46,47)	
		12	(22,68,76)	
		18	(5,65)	
		20	(52,98,110,114)	
		21	(74,79)	
		24	(15)	
		26	(112)	
		31	(6,15,20,34)	
		33	(63)	
		35	(11)	
		38	(69)	
		39	(49)	
		41	(47)	
		43	(20,61,85)	
		44	(32)	
		47	(25)	
		65	(12)	
فِعْل "Action"	1	21	(73)	[fiʕl-a]≈[faʕl-a] "action.Acc"
مِلْح "Salt"	2	25	(53)	[milħ-u-n]≈[malħ-u-n] "salt.Nom"
		35	(12)	
رِزْق "Provision"	55	2	(22,25,60,233)	[rizq-i] "provision.Gen"
		10	(59)	[rizq-i-n] "a provision.Gen"
		34	(4,15,36,39)	[rizq-u-n] "a provision.Nom"
		37	(41)	[rizq-a-n] "a provision.Acc"
		45	(5)	[rizq-u-hunna] "their.Fem provision.Nom"
		51	(22,57)	[ʔar-rizq-i] "The provision.Gen"
		3	(37)	[rizq-u-haa] "her provision.Nom"
		7	(32)	[ʔar-rizq-a] "The provision.Acc"
		8	(4,74)	[rizq-i-him] "their.Masc provision.Gern"
		11	(6,88)	[bi-rizq-i-n] "with a provision.Gen"
		13	(26)	[rizq-u-hum] "their.Masc provision.Nom"
		14	(32)	[rizq-u] "provision.Nom"
		16	(67,71,73,75,112)	[rizq-a-haa] "her provision.Acc"
		17	(30)	[la-rizq-u-naa] "surly our provision.Nom"
		18	(19)	[rizq-u-kum] "your.Plur.Masc provision.Nom"
		19	(62)	[rizq-u-hu] "his provision.Nom"
		20	(131,132)	[rizq-i-hi] "his provision.Gen"
		22	(50,58)	[rizq-a-hu] "his provision.Acc"
		24	(26)	
		28	(57,82)	Alkhatiib (2002) provided the pausal form of:
		29	(17,62)	[rizq-u-hunna]→ [rizq-u-hunnah]
		30	(37)	
		33	(31)	
		38	(54)	

		39	(52)		
		40	(13)		
		42	(12,27)		
		50	(11)		
		56	(82)		
		65	(7,11)		
		67	(15,21)		
		89	(16)		
سِحْر "Magic"	27	5	(110)	[siħr-u-n]	"a magic.Nom"
		6	(7)	[ʔas-siħr-a]	"The magic.Acc"
		11	(7)	[bi-siħr-i-n]	"with a magic.Gen"
		27	(13)	[la-siħr-u-n]	"surly a magic.Nom"
		28	(36)	[ʔas-siħr-u]	"The magic.Nom"
		34	(43)	[bi-siħr-i-k-a]	"with your.Sing.Masc magic"
		37	(15)	[bi-siħr-i-himaa]	"with their.dual magic.Gen"
		43	(30)	[siħr-i-him]	"their.Plur.Masc magic.Gen"
		46	(7)	[ʔas-siħr-i]	"The magic.Gen"
		54	(2)	[bi-siħr-i-hi]	"with his magic.Gen"
		61	(6)		
		74	(24)		
رِجْل "Leg"	1	38	(42)	[bi-riʒl-i-k-a]	"your.Sing.Masc.leg.Gen"
كِبْر "Greatness"	2	40	(56)	[kibr-u-n]	"a vanity"
		24	(11)	[kibr-a-hu]	"his vanity.Acc"
سِجْن "Prison"	6	12	(33,36,39,41,42,100)	[ʔas-siʒn-u]	"The prison.Nom"
				[ʔas-siʒn-a]	"The prison.Acc"
				[ʔas-siʒn-i]	"The prison.Gen"
شِعْر "Poetry"	1	36	(69)	[ʔaʃ-ʃiʕr-a]	"The poetry.Acc"
دِفْء "Warmth"	1	16	(5)	[difʔ-u-n]≈[diff-u-n]≈[dif-u-n] "a warmth.NOM" When pausing: [difʔ-u-n]→[diff]≈[dif]≈[dif-uʾ]≈[dif-uR] [diff-u-n]→[diff]	

Table3: The results of searching the 20 CiCC nominal stems and their paradigms

IBA

N	Word	CaCC	CaCC+1Pers		CaCC+2Pers				CaCC+3Pers			
			Sing [-i]	Plur [-na]	Sing+Masc [-ak]	Sing+Fem [-itʃ]	Plur.MASC [-kum]	Plur.Fem [-tʃan]	Sing+Masc [-a]	Sing+Fem [-ha]	Plur+MASC [-hum]	Plur+Fem [-hin]
1	نفس"Self"/nafs/	[nafis]	[nafs-i]	[nafisna]	[nafsak]	[nafsitʃ]	[nafiskum]	[nafistʃan]	[nafs-a]	[nafisha]	[nafishum]	[nafishin]
2	وعد"Promise"/waʕd/	[waʕad]	[waʕd-i]	[waʕadna]	[waʕdak]	[waʕditʃ]	[waʕadkum]	[waʕadtʃan]	[waʕd-a]	[waʕadha]	[waʕadhum]	[waʕadhin]
3	**شهر"Month"/ʃahr/**	**[ʃahar]**	**[ʃahr-i]**	**[ʃaharna]**	**[ʃahrak]**	**[ʃahritʃ]**	**[ʃaharkum]**	**[ʃahartʃan]**	**[ʃahr-a]**	**[ʃaharha]**	**[ʃaharhum]**	**[ʃaharhin]**
4	سبت"Saturday"/sabt/	[sabit]	[sabt-i]	[sabitna]	[sabtak]	[sabtitʃ]	[sabitkum]	[sabitʃan]	[sabt-a]	[sabitha]	[sabithum]	[sabithin]
5	برق"Lightning"/barq/	[bariq]	[barq-i]	[bariqna]	[barqak]	[barqitʃ]	[bariqkum]	[bariqtʃan]	[barq-a]	[bariqha]	[bariqhum]	[bariqhin]
6	**بحر"Sea"/baħr/**	**[baħar]**	**[baħr-i]**	**[baħarna]**	**[baħrak]**	**[baħritʃ]**	**[baħarkum]**	**[baħartʃan]**	**[baħr-a]**	**[baħarha]**	**[baħarhum]**	**[baħarhin]**
7	زوج"Spouse"/zawʒ/	[zooʒ] [zawiʒ]	[zooʒ-i] [zawʒ-i]	[zooʒna] [zawiʒna]	[zooʒak]	[zooʒitʃ] [zawiʒitʃ]	[zooʒkum]	[zooʒtʃan] [zawiʒtʃan]	[zooʒ-a] [zawʒ-a]	[zooʒha] [zawiʒha]	[zooʒhum] [zawiʒhum]	[zooʒhin] [zawiʒhin]
8	وجه"Face"/waʒh/	[wiʒih]	[wiʒh-i]	[wiʒihna]	[wiʒhak]	[wiʒhitʃ]	[wiʒihkum]	[wiʒihtʃan]	[wiʒh-a]	[wiʒihha]	[wiʒihhum]	[wiʒihhin]
9	**غلي"Boil"/ɣalj/**	**[ɣali]**	**[ɣalj-i]**		**[ɣaljak]**	**[ɣaljitʃ]**	**[ɣaliikum]**	**[ɣaliitʃan]**	**[ɣalj-a]**	**[ɣaliiha]**	**[ɣaliihum]**	**[ɣaliihin]**
10	زرع"Crop"/zarʕ/	[zariʕ]	[zarʕ-i]	[zariʕna]	[zarʕak]	[zarʕitʃtʃ]	[zariʕkum]	[zariʕtʃan]	[zarʕ-a]	[zariʕha]	[zariʕhum]	[zariʕhin]
11	حرف"Edge"/ħarf/	[ħarif]	[ħarf-i]	[ħarifna]	[ħarfak]	[ħarfitʃ]	[ħarifkum]	[ħariftʃan]	[ħarf-a]	[ħarifha]	[ħarifhum]	[ħarifhin]
12	رعد"Thunder"/raʕd/	[raʕid]	[raʕd-i]	[raʕidna]	[raʕdak]	[raʕditʃ]	[raʕadkum]	[raʕidtʃan]	[raʕd-a]	[raʕidha]	[raʕidhum]	[raʕidhin]
13	كلب"Dog"/kalb/	[tʃalib]	[tʃalb-i]	[tʃalibna]	[tʃalbak]	[tʃalbitʃ]	[tʃalibkum]	[tʃalibtʃan]	[tʃalb-a]	[tʃalibha]	[tʃalibhum]	[tʃalibhin]
14	**لحم"Meat"/laħm/**	**[laħam]**	**[laħm-i]**	**[laħamna]**	**[laħmak]**	**[laħmitʃ]**	**[laħamkum]**	**[laħamtʃan]**	**[laħm-a]**	**[laħamha]**	**[laħamhum]**	**[laħamhin]**
15	**فضل "Bounty"/faðˤl/**	**[faðˤil]**	**[faðˤl-i]**	**[faðˤilna]**	**[faðˤlak]**	**[faðˤlitʃ]**	**[faðˤilkum]**	**[faðˤiltʃan]**	**[faðˤl-a]**	**[faðˤilha]**	**[faðˤilhum]**	**[faðˤilhin]**
16	**رأس"Head"/raʔs/**	**[raas]**	**[raas-i]**	**[raasna]**	**[raasak]**	**[raasitʃ]**	**[raaskum]**	**[raastʃan]**	**[raas-a]**	**[raasha]**	**[raashum]**	**[raashin]**
17	قلب"Heart"/qalb/	[galʕib]	[galʕb-i]	[galʕibna]	[galʕbak]	[galʕbitʃ]	[galʕibkum]	[galʕibtʃan]	[galʕb-a]	[galʕibha]	[galʕibhum]	[galʕibhin]
18	شر "evil"/ʃarr/	[ʃar]	[ʃarr-i]	[ʃarna]	[ʃarrak]	[ʃarritʃ]	[ʃarrak]	[ʃartʃan]	[ʃarr-a]	[ʃarha]	[ʃarhum]	[ʃarhin]
19	شيء"Thing"/ʃajʔ/[64]	[ʃii]	[ʃijj-i]	[ʃiijna]	[ʃijjak]	[ʃijjitʃ]	[ʃiiʔkum]		[ʃijj-a]	[ʃiiha]	[ʃiihum]	[ʃiihin]
20	أرض"Earth"/ʔardˤ/	[ʔariðˤ]	[ʔarðˤ-i]	[ʔariðˤna]	[ʔarðˤak]	[ʔarðˤitʃ]	[ʔariðˤkum]	[ʔariðˤtʃan]	[ʔarðˤ-a]	[ʔariðˤha]	[ʔariðˤhum]	[ʔariðˤhin]

Table: 3.1 IBA-CaCC stems.

[64] I was informed that even though that this word is part of IBA vocabluraies but to express the meaning "thing" the more common word is [ħaaʒa].

N	word	CuCC	CuCC+1Pers		CuCC+2Pers				CuCC+3Pers			
			Sing [-i]	Plur [-na]	Sing+Masc [-ak]	Sing+Fem [-tʃ]	Plur+Masc [-kum]	Plur+Masc [-tʃan]	Sing+Masc [-a]	Sing+Fem [-ha]	Plur+Masc [hum]	Plur+Fem [-hin]
1	أخت "Sister"/ʔuxt/	[ʔix*i*t]	[ʔixti]	[ʔix*i*tna]	[ʔuxtak]	[ʔixtitʃ]	[ʔix*i*tkum]	[ʔix*i*tʃan]	[ʔuxta]	[ʔix*i*tha]	[ʔux*u*thum]	[ʔux*u*thin]
2	جزء "Part"/ʒuzʔ/	[ʒuzʔ] [ʒuz*u*w]	[ʒizʔi]	[ʒuz*u*na]	[ʒuzʔak]	[ʒuzʔitʃ]	[ʒiz*i*ʔkum]	[ʒiz*i*ʔtʃan]	[ʒuzʔ-a]	[ʒuz*u*ʔha]	[ʒuz*u*ʔhum]	[ʒuz*u*ʔhin]
3	ملك "Clouts"/mulk/	[mul*u*k]	[mulki]	[mul*i*kna]	[mulkak]	[mulkitʃ]	[mul*u*kkum]	[mil*i*ktʃan]	[mulka]	[mul*u*kha]	[mul*u*khum]	[mul*u*khin]
4	**بخل "Avarice"/buxl/**	**[bux*u*l]**	**[buxli]**	**[buxu*l*na]**	**[buxlak]**	**[buxlitʃ]**	**[bux*u*lkum]**	**[bux*u*ltʃan]**	**[buxla]**	**[bux*u*lha]**	**[bux*u*lhum]**	**[bux*u*lhin]**
5	**ركن "Backlog"/rukn/**	**[ruk*u*n]**	**[rukni]**	**[ruk*i*nna]**	**[ruknak]**	**[ruknitʃ]**	**[rik*i*nkum]**	**[rik*i*ntʃan]**	**[rukna]**	**[ruk*u*nha]**	**[ruk*u*nhum]**	**[ruk*u*nhin]**
6	**كفر "Disbelief"/kufr/**	**[kuf*u*r]**	**[kufri]**	**[kuf*u*rna]**	**[kufrak]**	**[kufritʃ]**	**[kuf*u*rkum]**	**[kuf*u*rtʃan]**	**[kufra]**	**[kuf*u*rha]**	**[kuf*u*rhum]**	**[kuf*u*rhin]**
7	ظلم "Injustice"/ðˤulm/	[ðˤul*u*m]	[ðˤulˤmi]	[ðˤul*u*mna]	[ðˤulˤmak]	[ðˤulˤmitʃ]	[ðˤul*u*mkum]	[ðˤulumtʃan]	[ðˤulˤma]	[ðˤul*u*mha]	[ðˤul*u*mhum]	[ðˤul*u*mhin]
8	**شكر "Gratitude"/ʃukr/**	**[ʃuk*u*r]**	**[ʃukri]**	**[ʃuk*u*rna]**	**[ʃukrak]**	**[ʃukritʃ]**	**[ʃuk*u*rkum]**	**[ʃuk*u*rtʃan]**	**[ʃukra]**	**[ʃuk*u*rha]**	**[ʃuk*u*rhum]**	**[ʃuk*u*rhin]**
9	كره "Hate"/kurh/	[kur*u*h]	[kurhi]	[kur*u*hna]	[kurhak]	[kurhitʃ]	[kur*u*hkum]	[kur*u*htʃan]	[kurha]	[kur*u*hha]	[kur*u*hhum]	[kur*u*hhin]
10	عرف "Custom"/ʕurf/	[ʕur*u*f]	[ʕurfi]	[ʕur*u*fna]	[ʕurfak]	[ʕurfitʃ]	[ʕur*u*fkum]	[ʕur*u*ftʃan]	[ʕurfa]	[ʕur*u*fha]	[ʕur*u*fhum]	[ʕur*u*fhin]
11	رعب "Fright"/ruʕb/	[ruʕ*u*b]	[ruʕbi]	[ruʕ*u*bna]	[ruʕbak]	[ruʕbitʃ]	[ruʕubkum]	[ruʕubtʃan]	[ruʕba]	[ruʕubha]	[ruʕubhum]	[ruʕubhin]
12	**دهن "Fat"/duhn/**	**[dih*i*n]**	**[dihni]**	**[dih*i*nna]**	**[dihnak]**	**[dihnitʃ]**	**[dih*i*nkum]**	**[dih*i*ntʃan]**	**[dihna]**	**[dih*i*nha]**	**[dih*i*nhum]**	**[dih*i*nhin]**
13	**صبح "Morning"/sˤubh/**	**[sˤub*i*ħ]**	**[sˤubħi]**	**[sˤub*i*ħna]**	**[sˤubħak]**	**[sˤubħitʃ]**	**[sˤib*u*ħkum]**	**[sˤub*i*ħtʃan]**	**[sˤubħa]**	**[sˤub*i*ħha]**	**[sˤub*i*ħhum]**	**[sˤub*i*ħhin]**
14	**حكم "Ruling"/ħukm/**	**[ħuk*u*m]**	**[ħukmi]**	**[ħuk*u*mna]**	**[ħukmak]**	**[ħukmitʃ]**	**[ħuk*u*mkum]**	**[ħukmtʃan]**	**[ħukma]**	**[ħuk*u*mha]**	**[ħuk*u*mhum]**	**[ħuk*u*mhin]**
15	**عذر "Excuse"/ʕuðr/**	**[ʕuð*i*r]**	**[ʕuðri]**	**[ʕuð*u*rna]**	**[ʕuðrak]**	**[ʕuðritʃ]**	**[ʕuð*u*rkum]**	**[ʕuð*u*rtʃan]**	**[ʕuðra]**	**[ʕuð*u*rha]**	**[ʕuð*u*rhum]**	**[ʕuð*u*rhin]**
16	صلح "Conciliation"/sˤulħ/	[sˤul*u*ħ]	[sˤilħi]	[sˤul*i*ħna]	[sˤilħak]	[sˤilħitʃ]	[sˤul*u*ħkum]	[sˤul*u*ħtʃan]	[sˤulħa]	[sˤul*u*ħha]	[sˤul*u*ħhum]	[sˤul*u*ħhin]
17	**وسع "Capability"/wusʕ/**	**[wis*i*ʕ]**	**[wisʕi]**	**[wisʕna]**	**[wisʕak]**	**[wisʕitʃ]**	**[wis*i*ʕkum]**	**[wis*i*ʕtʃan]**	**[wisʕa]**	**[wis*i*ʕha]**	**[wis*i*ʕhum]**	**[wis*i*ʕhin]**
18	**حزن "Grief"/huzn/**	**[ħiz*i*n]**	**[ħizni]**	**[ħiz*i*nna]**	**[ħiznak]**	**[ħiznitʃ]**	**[ħiz*i*nkum]**	**[ħiz*i*ntʃan]**	**[ħizna]**	**[ħiz*i*nha]**	**[ħiz*i*nhum]**	**[ħiz*i*nhin]**
19	صنع "Manufacture"/sˤunʕ/	[sˤin*i*ʕ]	[sˤinʕi]	[sˤin*i*ʕna]	[sˤinʕak]	[sˤinʕitʃ]	[sˤun*u*ʕkum]	[sˤun*u*ʕtʃan]	[sˤunʕa]	[sˤun*u*ʕha]	[sˤun*u*ʕhum]	[sˤun*u*ʕhin]
20	**حسن "Beauty"/ħusn/**	**[ħis*i*n]**	**[ħisni]**	**[ħis*i*nna]**	**[ħisnak]**	**[ħisnitʃ]**	**[ħis*i*nkum]**	**[ħis*i*ntʃan]**	**[ħisna]**	**[ħis*i*nha]**	**[ħis*i*nhum]**	**[ħis*i*nhin]**

Table: 3.2 IBA-CuCC stems.

N	Word	CiCC	CiCC+1		CiCC+2				CiCC+3			
			Sing [-i]	Plur [-na]	Sing+Masc [-ak]	Sing+Fem [-iʧ]	Plur.Masc [-kum]	Plur.Fem [-ʧan]	Sing+Masc [-a]	Sing+Fem [-ha]	Plur.Masc [-hum]	Plur.Fem [-hin]
1	ضعف "Double"/dˤiʕf/	[ðˤiʕif]	[ðˤiʕfi]	[ðˤiʕifna]	[ðˤiʕfak]	[ðˤiʕfiʧ]	[ðˤiʕifkum]	[ðˤiʕifʧan]	[ðˤiʕfa]	[ðˤiʕifha]	[ðˤiʕifhum]	[ðˤiʕifhin]
2	صدق "truth"/sˤidq/	[sˤidig]	[sˤidgi]	[sˤidigna]	[sˤidgak]	[sˤidgiʧ]	[sˤidigkum]	[sˤidigʧan]	[sˤidga]	[sˤidigha]	[sˤidighum]	[sˤidighin]
3	جذع "Bole"/ʒiðʕ/	[ʒiðiʕ]	[ʒiðʕi]	[ʒiðiʕna]	[ʒiðʕak]	[ʒiðʕiʧ]	[ʒiðiʕkum]	[ʒiðiʕʧan]	[ʒiðʕa]	[ʒiðiʕha]	[ʒiðiʕhum]	[ʒiðiʕhin]
4	حزب "Cabal"/ħizb/	[ħizib]	[ħizbi]	[ħizibna]	[ħizbak]	[ħizbiʧ]	[ħizibkum]	[ħizibʧan]	[ħizba]	[ħizibha]	[ħizibhum]	[ħizibhin]
5	مسك "Muskiness"/misk/	[misik]	[miski]	[misikna]	[miskak]	[miskiʧ]	[misikkum]	[misikʧan]	[miska]	[misikha]	[misikhum]	[misikhin]
6	**بئر "Well"/biʔr/**	**[biir]**	**[biiri]**	**[biirna]**	**[biirak]**	**[biiriʧ]**	**[biirkum]**	**[biirʧan]**	**[biira]**	**[biirha]**	**[biirhum]**	**[biirhin]**
7	**ذنب "Wolf"/ðiʔb/**	**[ðiib]**	**[ðiibi]**	**[ðiibna]**	**[ðiibak]**	**[ðiibiʧ]**	**[ðiibkum]**	**[ðiibʧan]**	**[ðiiba]**	**[ðiibha]**	**[ðiibhum]**	**[ðiibhin]**
8	**إذن "Permission"/ʔiðn/**	**[ʔiðin]**	**[ʔiðni]**	**[ʔiðinna]**	**[ʔiðnak]**	**[ʔiðniʧ]**	**[ʔiðinkum]**	**[ʔiðinʧan]**	**[ʔiðna]**	**[ʔiðnha]**	**[ʔiðinhum]**	**[ʔiðinhin]**
9	قسط "Justice"/qistˤ/	[qisitˤ]	[qistˤi]	[qisitˤna]	[qistˤak]	[qistˤiʧ]	[qisitˤkum]	[qisitˤʧan]	[qistˤa]	[qasitˤha]	[qisitˤhum]	[qisitˤhin]
10	**عجل "Calf"/ʕiʒl/**	**[ʕiʒil]**	**[ʕiʒli]**	**[ʕiʒilna]**	**[ʕiʒlak]**	**[ʕiʒliʧ]**	**[ʕiʒilkum]**	**[ʕiʒilʧan]**	**[ʕiʒla]**	**[ʕiʒilha]**	**[ʕiʒilhum]**	**[ʕiʒilhin]**
11	علم "Science/knowledge"/ʕilm/	[ʕilim]	[ʕilmi]	[ʕilimna]	[ʕilmak]	[ʕilmiʧ]	[ʕilimkum]	[ʕilimʧan]	[ʕilma]	[ʕilimha]	[ʕilimhum]	[ʕilimhin]
12	**فعل "Action"/fiʕl/**	**[fiʕil]**	**[fiʕli]**	**[fiʕilna]**	**[fiʕlak]**	**[fiʕliʧ]**	**[fiʕilkum]**	**[fiʕilʧan]**	**[fiʕla]**	**[fiʕilha]**	**[fiʕilhum]**	**[fiʕilhin]**
13	ملح "Salt"/milħ/	[miliħ]	[milħi]	[miliħna]	[milħak]	[milħiʧ]	[miliħkum]	[miliħʧan]	[milħa]	[miliħħa]	[miliħhum]	[miliħhin]
14	رزق "Livelihood"/rizq/	[riziq]	[rizqi]	[riziqna]	[rizqak]	[rizqiʧ]	[riziqkum]	[riziqʧan]	[rizqa]	[riziqha]	[riziqhum]	[riziqhin]
15	**سحر "Magic"/sihr/**	**[sihir]**	**[sihri]**	**[sihirna]**	**[sihrak]**	**[sihriʧ]**	**[sihirkum]**	**[sihirʧan]**	**[sihra]**	**[sihirha]**	**[sihirhum]**	**[sihirhin]**
16	**رجل "Leg"/riʒl/**	**[riʒil]**	**[riʒli]**	**[riʒilna]**	**[riʒlak]**	**[riʒliʧ]**	**[riʒilkum]**	**[riʒilʧan]**	**[riʒla]**	**[riʒilha]**	**[riʒilhum]**	**[riʒilhin]**
17	**كبر "Vanity"/kibr/**	**[kibir]**	**[kibri]**	**[kibirna]**	**[kibrak]**	**[kibriʧ]**	**[kibarkum]**	**[kibarʧan]**	**[kibra]**	**[kibarha]**	**[kibarhum]**	**[kibarhin]**
18	**سجن "Prison"/siʒn/**	**[siʒin]**	**[siʒni]**	**[siʒinna]**	**[siʒnak]**	**[siʒniʧ]**	**[siʒinkum]**	**[siʒinʧan]**	**[siʒna]**	**[siʒnha]**	**[siʒinhum]**	**[siʒinhin]**
19	**شعر "Poetry"/ʃiʕr/**	**[ʃiʕir]**	**[ʃiʕri]**	**[ʃiʕirna]**	**[ʃiʕrak]**	**[ʃiʕriʧ]**	**[ʃiʕirkum]**	**[ʃiʕirʧan]**	**[ʃiʕra]**	**[ʃiʕirha]**	**[ʃiʕirhum]**	**[ʃiʕirhin]**
20	دفء "Warmth"/difʔ/	[difu] [difuw]	[dafwi] [dufwi]	[dafuuna]	[dafwak]	[difwiʧ]	[difuukum]	[difuuʧan]	[difwa]	[difuuha]	[difuuhum]	[difuuhin]

Table: 3.3 IBA-CiCC stems.

ECA

N	Word	CaCC	CaCC+1		CaCC+2			CaCC+3		
			Sing+1Pers [-i]	Plur+1Pers [-na]	Sing+Masc [-ak]	Sing+Fem [-ik]	Plur [kum]≈[kuu]	Sing+Masc [-u]	Sing+Fem [ha]	Plur [-hum]
1	نفس "Self"/nafs/	[nafs]	[nafsi]	[nafsina]	[nafsak]	[nafsik]	[nafsukum] [nafsukuu]	[nafsu]	[nafsaha]	[nafsuhum]
2	وعد "promise"/waʕd/	[waʕd]	[waʕdi]	[waʕdina]	[waʕdak]	[waʕdik]	[waʕdukum] [waʕdukuu]	[waʕdu]	[waʕdaha]	[waʕduhum]
3	**شهر "Month"/ʃahr/**	**[ʃahr]**	**[ʃahri]**	**[ʃahrina]**	**[ʃahrak]**	**[ʃahrik]**	**[ʃahrukuu]**	**[ʃahru]**	**[ʃahraha]**	**[ʃahruhum]**
4	سبت "Saturday"/sabt/	[sabt]	[sabti]	[sabtina]	[sabtak]	[sabtik]	[sabtukuu]	[sabtu]	[sabtaha]	[sabtuhum]
5	برق "Lightning"/barq/	[barʔ]	[barʔi]	[barʔina]	[barʔak]	[barʔik]	[barʔukuu]	[barʔu]	[barʔaha]	[barʔuhum]
6	**بحر "Sea"/baħr/**	**[baħr]**	**[baħri]**	**[baħrina]**	**[baħrak]**	**[baħrik]**	**[baħrukuu]**	**[baħru]**	**[baħraha]**	**[baħruhum]**
7	زوج "Spouse"/zawʒ/	[zuug] [guuz]	[guuzi]	[guzna]	[guuzak]	[guuzik]	[guzkuu]	[guuzu]	[guzha]	[guzhum]
8	وجه "Face"/waʒh/	[wiʃ]	[wiʃʃi]	[wiʃʃina]	[wiʃʃak]	[wiʃʃik]	[wiʃʃukuu]	[wiʃʃu]	[wiʃʃaha]	[wiʃʃuhum]
9	**غلي "Boil"/ɣalj/**	**[ɣalj]**	**[ɣalji]**	**[ɣaljina]**	**[ɣaljak]**	**[ɣaljik]**	**[ɣaljukuu]**	**[ɣalju]**	**[ɣaljaha]**	**[ɣaljuhum]**
10	زرع "Crop"/zarʕ/	[zarʕ]	[zarʕi]	[zarʕina]	[zarʕak]	[zarʕik]	[zarʕukuu]	[zarʕu]	[zarʕaha]	[zarʕuhum]
11	حرف "Edge"/ħarf/	[ħarf]	[ħarfi]	[ħarfina]	[ħarfak]	[ħarfik]	[ħarfukuu]	[ħarfu]	[ħarfaha]	[ħarfuhum]
12	رعد "Thunder"/raʕd/	[raʕd]	[raʕdi]	[raʕdina]	[raʕdak]	[raʕdik]	[raʕdukuu]	[raʕdu]	[raʕdaha]	[raʕduhum]
13	كلب "Dog"/kalb/	[kalb]	[kalbi]	[kalbina]	[kalbak]	[kalbik]	[kalbukuu]	[kalbu]	[kalbaha]	[kalbuhum]
14	**لحم "Meat"/laħm/**	**[laħm]**	**[laħmi]**	**[laħmina]**	**[laħmak]**	**[laħmik]**	**[laħmukuu]**	**[laħmu]**	**[laħmaha]**	**[laħmuhum]**
15	**فضل "Bounty"/fadˤl/**	**[fadˤl]**	**[fadˤli]**	**[fadˤlina]**	**[fadˤlak]**	**[fadˤlik]**	**[fadˤlukum]**	**[fadˤlu]**	**[fadˤlaha]**	**[fadˤluhum]**
16	**رأس "Head"/raʔs/**	**[raas]**	**[raasi]**	**[rasna]**	**[raasak]**	**[raasik]**	**[raskuu] [raskum]**	**[raasu]**	**[rasha]**	**[rashum]**
17	قلب "Heart"/qalb/	[ʔalb]	[ʔalbi]	[ʔalbina]	[ʔalbak]	[ʔalbik]	[ʔalbukuu]	[ʔalbu]	[ʔalbaha]	[ʔalbuhum]
18	شر "evil"/ʃar/	[ʃar]	[ʃarri]	[ʃarrina]	[ʃarrak]	[ʃarrik]	[ʃarrukum]	[ʃarru]	[ʃarraha]	[ʃarruhum]
19	شيء "Thing" /ʃajʔ/[65]	[ʃiiʔ]								
20	أرض "Earth"/ʔardˤ/	[ʔardˤ]	[ʔardˤi]	[ʔardˤina]	[ʔardˤak]	[ʔardˤik]	[ʔardˤukuu]	[ʔardˤu]	[ʔardˤaha]	[ʔardˤuhum]

[65] I was informed that even though that this word is not part of ECA vocabluraies. The meaning "thing" is expressed through [ħaaga].

Table: 4.1 ECA-CaCC stems.

N	Word	CuCC	CuCC+1		CuCC+2			CuCC+3		
			Sing [-i]	Plur [-na]	Sing+Masc [-ak]	Sing+Fem [-ik]	Plur [-kuu]≈[kum]	Sing+Masc [-u]	Sing+Fem [-ha]	Plur [-hum]
1	أخت "Sister"/ʔuxt/	[ʔuxt]	[ʔuxti]	[ʔuxt*i*na]	[ʔuxtak]	[ʔuxtik]	[ʔuxt*u*kuu]	[ʔuxtu]	[ʔuxt*a*ha]	[ʔuxt*u*hum]
2	جزء "Part"/ʒuzʔ/[1]	[ʒuzʔ]	[ʒuzʔi]	[ʒuzʔ*i*na]	[guzʔak]	[guzʔik]	[guzʔ*u*kuu]	[guzʔu]	[guzʔ*a*ha]	[guzʔ*u*hum]
3	ملك "Clouts"/mulk/	[mulk]	[milki]	[milk*i*na]	[milkak]	[milkik]	[milk*u*kuu]	[milku]	[milk*a*ha]	[milk*u*hum]
4	**بخل "Avarice"/buxl/**	**[buxl]**	**[buxli]**	**[buxl*i*na]**	**[buxlak]**	**[buxlik]**	**[buxl*u*kuu]**	**[buxlu]**	**[buxl*a*ha]**	**[buxl*u*hum]**
5	**ركن "Backlog"/rukn/**	**[rukn]**	**[rukni]**	**[rukn*i*na]**	**[ruknak]**	**[ruknik]**	**[rukn*u*kuu]**	**[ruknu]**	**[rukn*a*ha]**	**[rukn*u*hum]**
6	**كفر "Disbelief"/kufr/**	**[kufr]**	**[kufri]**	**[kufr*i*na]**	**[kufrak]**	**[kufrik]**	**[kufr*u*kuu]**	**[kufru]**	**[kufr*a*ha]**	**[kufr*u*hum]**
7	ظلم "Injustice"/zˤulm/	[zˤulm]	[zˤulmi]	[zˤulm*i*na]	[zˤulmak]	[zˤulmik]	[zˤulm*u*kuu]	[zˤulmu]	[zˤulm*a*ha]	[zˤulm*u*hum]
8	**شكر "Gratitude"/ʃukr/**	**[ʃukr]**	**[ʃukri]**	**[ʃukr*i*na]**	**[ʃukrak]**	**[ʃukrik]**	**[ʃukr*u*kuu]**	**[ʃukru]**	**[ʃukr*a*ha]**	**[ʃukr*u*hum]**
9	كره "Hate"/kurh/	[kurh]	[kurhi]	[kurh*i*na]	[kurhak]	[kurhik]	[kurh*u*kuu]	[kurhu]	[kurh*a*ha]	[kurh*u*hum]
10	عرف "Custom"/ʕurf/	[ʕurf]	[ʕurfi]	[ʕurf*i*na]	[ʕurfak]	[ʕurfik]	[ʕurf*u*kuu]	[ʕurfu]	[ʕurf*a*ha]	[ʕurf*u*hum]
11	رعب "Fright"/ruʕb/	[ruʕb]	[ruʕbi]	[ruʕb*i*na]	[ruʕbak]	[ruʕbik]	[ruʕb*u*kuu]	[ruʕbu]	[ruʕb*a*ha]	[ruʕb*u*hum]
12	**دهن "Fat"/duhn/**	**[dihn]**	**[dihni]**	**[dihn*i*na]**	**[dihnak]**	**[dihnik]**	**[dihn*u*kuu]**	**[dihnu]**	**[dihn*a*ha]**	**[dihn*u*hum]**
13	**صبح "Morning"/sˤubħ/**	**[sˤubh]**	**[sˤubhi]**	**[sˤubh*i*na]**	**[sˤubhak]**	**[sˤubhik]**	**[sˤubh*u*kuu]**	**[sˤubhu]**	**[sˤubħ*a*ha]**	**[sˤubh*u*hum]**
14	**حكم "Ruling"/ħukm/**	**[hukm]**	**[hukmi]**	**[hukm*i*na]**	**[hukmak]**	**[hukmik]**	**[hukm*u*kuu]**	**[hukmu]**	**[hukm*a*ha]**	**[hukm*u*hum]**
15	**عذر "Excuse"/ʕuðr/**	**[ʕuzr]**	**[ʕuzri]**	**[ʕuzr*i*na]**	**[ʕuzrak]**	**[ʕuzrik]**	**[ʕuzr*u*kuu]**	**[ʕuzru]**	**[ʕuzr*a*ha]**	**[ʕuzr*u*hum]**
16	صلح "Conciliation"/sˤulħ/	[sˤulħ]	[sˤulħi]	[sˤulħ*i*na]	[sˤulħak]	[sˤulħik]	[sˤulħ*u*kuu]	[sˤulħu]	[sˤulħ*a*ha]	[sˤulħ*u*hum]
17	**وسع "Capability"/wusʕ/**	**[wisʕ]**	**[wisʕi]**	**[wisʕ*i*na]**	**[wisʕak]**	**[wisʕik]**	**[wisʕ*u*kuu]**	**[wisʕu]**	**[wisʕ*a*ha]**	**[wisʕ*u*hum]**
18	**حزن "Grief"/ħuzn/**	**[huzn]**	**[huzni]**	**[huzn*i*na]**	**[huznak]**	**[huznik]**	**[huzn*u*kuu]**	**[huznu]**	**[huzn*a*ha]**	**[huzn*u*hum]**
19	صنع "Manufacture"/sˤunʕ/	[sˤunʕ]	[sˤunʕi]	[sˤunʕ*i*na]	[sˤunʕak]	[sˤunʕik]	[sˤunʕ*u*kuu]	[sˤunʕu]	[sˤunʕ*a*ha]	[sˤunʕ*u*hum]
20	**حسن "Beauty"/husn/**	**[husn]**	**[husni]**	**[husn*i*na]**	**[husnak]**	**[husnik]**	**[husn*u*kuu]**	**[husnu]**	**[husn*a*ha]**	**[husn*u*hum]**

Table: 4.2 ECA-CuCC stems.

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[1] I was informed that the meaning "part" is expressed through [tˤarf] not /ʒuzʔ/.

N	Word	CiCC	CiCC+1		CiCC+2			CiCC+3		
			Sing [-i]	Plur [-na]	Sing+Masc [-ak]	Sing+Fem [-ik]	Plur [-kuu]≈[kum]	Sing+Masc [-u]	Sing+Fem [-ha]	Plur [-hum]
1	ضعف "Double"/dˤiʕf/	[dˤiʕf]	[dˤiʕfi]	[dˤiʕfina]	[dˤiʕfak]	[dˤiʕfik]	[dˤiʕfukuu]	[dˤiʕfu]	[dˤiʕfaha]	[dˤiʕfuhum]
2	صدق "Authenticity"/sˤidq/	[sidʔ]	[sidʔi]	[sidʔina]	[sidʔak]	[sidʔik]	[sidʔukuu]	[sidʔu]	[sidʔaha]	[sidʔuhum]
3	جذع "Bole"/ʒiðʕ/	[gizʕ] [gidʕ]	[gizʕi] [gidʕi]	[gizʕina] [gidʕina]	[gizʕak] [gidʕak]	[gizʕik] [gidʕik]	[gizʕukuu] [gidʕukuu]	[gizʕu] [gidʕu]	[gizʕaha] [gidʕaha]	[gizʕuhum] [gidʕuhum]
4	حزب "Cabal"/ħizb/	[ħizb]	[ħizbi]	[ħizbina]	[ħizbak]	[ħizbik]	[ħizbukuu]	[ħizbu]	[ħizbaha]	[ħizbuhum]
5	مسك "Muskiness"/misk/	[misk]	[miski]	[miskina]	[miskak]	[miskik]	[miskukuu]	[misku]	[miskaha]	[miskuhum]
6	**بئر "Well"/biʔr/**	**[biir]**	**[biiri]**	**[birna]**	**[biirak]**	**[biirik]**	**[birkuu]**	**[biiru]**	**[birha]**	**[birhum]**
7	**ذئب "Wolf"/ðiʔb/**	**[diib]**	**[diibi]**	**[dibna]**	**[diibak]**	**[diibik]**	**[dibkuu]**	**[diibu]**	**[dibha]**	**[dibhum]**
8	**إذن "Permission"/ʔiðn/**	**[ʔizn]**	**[ʔizni]**	**[ʔiznina]**	**[ʔiznak]**	**[ʔiznik]**	**[ʔiznukuu]**	**[ʔiznu]**	**[ʔiznaha]**	**[ʔiznuhum]**
9	قسط "Justice"/qistˤ/	[ʔisˤtˤ]	[ʔisˤtˤi]	[ʔisˤtˤina]	[ʔisˤtˤak]	[ʔisˤtˤik]	[ʔisˤtˤukuu]	[ʔisˤtˤu]	[ʔisˤtˤaha]	[ʔisˤtˤuhum]
10	**عجل "Calf"/ʕiʒl/**	**[ʕigl]**	**[ʕigli]**	**[ʕiglina]**	**[ʕiglak]**	**[ʕiglik]**	**[ʕiglukuu]**	**[ʕiglu]**	**[ʕiglaha]**	**[ʕigluhum]**
11	علم "Science/knowledge"/ʕilm/	[ʕilm]	[ʕilmi]	[ʕilmina]	[ʕilmak]	[ʕilmik]	[ʕilmukuu]	[ʕilmu]	[ʕilmaha]	[ʕilmuhum]
12	**فعل "Action"/fiʕl/**	**[fiʕl]**	**[fiʕli]**	**[fiʕlina]**	**[fiʕlak]**	**[fiʕlik]**	**[fiʕlukuu]**	**[fiʕlu]**	**[fiʕlaha]**	**[fiʕluhum]**
13	ملح "Salt"/milħ/	[malħ]	[malħi]	[malħina]	[malħak]	[malħik]	[malħukuu] [malħukum]	[malħu]	[malħaha]	[malħuhum]
14	رزق "Livelihood"/rizq/	[rizʔ]	[rizʔi]	[rizʔina]	[rizʔak]	[rizʔik]	[rizʔukuu]	[rizʔu]	[rizʔaha]	[rizʔuhum]
15	**سحر "Magic"/sihr/**	**[sihr]**	**[sihri]**	**[sihrina]**	**[sihrak]**	**[sihrik]**	**[sihrukuu]**	**[sihru]**	**[sihraha]**	**[sihruhum]**
16	**رجل "Leg"/riʒl/**	**[rigl]**	**[rigli]**	**[riglina]**	**[riglak]**	**[riglik]**	**[riglukuu]**	**[riglu]**	**[riglaha]**	**[rigluhum]**
17	**كبر "Vanity"/kibr/**	**[kibr]**	**[kibri]**	**[kibrina]**	**[kibrak]**	**[kibrik]**	**[kibrukuu]**	**[kibru]**	**[kibraha]**	**[kibruhum]**
18	**سجن "Prison"/siʒn/**	**[sign]**	**[signi]**	**[signina]**	**[signak]**	**[signik]**	**[signukuu]**	**[signu]**	**[signaha]**	**[signuhum]**
19	**شعر "Poetry"/ʃiʕr/**	**[ʃiʕr]**	**[ʃiʕri]**	**[ʃiʕrina]**	**[ʃiʕrak]**	**[ʃiʕrik]**	**[ʃiʕrukuu]**	**[ʃiʕru]**	**[ʃiʕraha]**	**[ʃiʕruhum]**
20	دفء "Warmth"/difʔ/	*[dafaa]*	*[dafaaj]*	*[dafaana]*	*[dafaak]*	*[dafaaki]*	*[dafaakuu]* *[dafaakum]*	*[dafaah]*	*[dafaaha]*	*[dafaahum]*

Table: 4.3 ECA-CiCC stems.

Appendix 5

KħA

N	Word	CaCC	CaCC+1Pers		CaCC+2Pers			CaCC+3Pers		
			Sing [-i]	Plur [-na]	Sing+Masc [-ik]	Sing+Fem [-itʃ]	Plur [-kum]	Sing+Masc [-a]	Sing+Fem [-ha]	Plur [-hum]
1	نفس "Self"/nafs/	[nafs]	[nafsi]	[nafsna]	[nafsik]	[nafsitʃ]	[nafskum]	[nafsa]	[nafsha]	[nafshum]
2	وعد "Promise"/waʕd/	[waʕad]	[waʕdi]	[waʕadna]	[waʕdik]	[waʕditʃ]	[waʕadkum]	[waʕda]	[waʕadha]	[waʕadhum]
3	**شهر "Month"/ʃahr/**	**[ʃahar]**	**[ʃahri]**	**[ʃaharna]**	**[ʃahrik]**	**[ʃahritʃ]**	**[ʃaharkum]**	**[ʃahra]**	**[ʃaharha]**	**[ʃaharhum]**
4	سبت "Saturday"/sabr/	[sabt]	[sabti]	[sabtna]	[sabtik]	[sabtitʃ]	[sabtkum]	[sabta]	[sabtha]	[sabthum]
5	برق "Lightning"/barq/	[barg]	[bargi]	[bargna]	[bargik]	[bargitʃ]	[bargkum]	[barga]	[bargha]	[barghum]
6	**بحر "Sea"/baħr/**	**[bahar]**	**[bahri]**	**[baharna]**	**[bahrik]**	**[bahritʃ]**	**[baharkum]**	**[bahra]**	**[baharha]**	**[barharum]**
7	زوج "Spouse"/zawʒ/	[zooʒ]	[zooʒi]	[zooʒna]	[zooʒik]	[zooʒitʃ]	[zooʒkum]	[zooʒa]	[zooʒha]	[zooʒhum]
8	وجه "Face"/waʒh/	[wajh]	[wajhi]	[wajihna] [wajhna]	[wajhik]	[wajhitʃ]	[wajihkum] [wajhkum]	[wajha]	[wajihha]	[wajhhum]
9	**غلي "Boil"/ɣalj/**	**[ɣali]**	**[ɣalji]**		**[ɣaljik]**	**[ɣaljitʃ]**	**[ɣaliikum]**	**[ɣalja]**	**[ɣaliiha]**	**[ɣaliihum]**
10	زرع "Crop"/zarʕ/	[zarʕ]	[zarʕi]	[zarʕna]	[zarʕik]	[zarʕitʃ]	[zarʕkum]	[zarʕa]	[zarʕha]	[zarʕhum]
11	حرف "Edge"/ħarf/	[ħarf]	[ħarfi]	[ħarfna]	[ħarfik]	[ħarfitʃ]	[ħarfkum]	[ħarfa]	[ħarfha]	[ħarfhum]
12	رعد "Thunder"/raʕd/	[raʕd]	[raʕdi]	[raʕdna]	[raʕdik]	[raʕditʃ]	[raʕdkum]	[raʕda]	[raʕdha]	[raʕdhum]
13	كلب "Dog"/kalb/	[tʃalb]	[tʃalbi]	[tʃalbna]	[tʃalbik]	[tʃalbitʃ]	[tʃalbkum]	[tʃalba]	[tʃalbha]	[tʃalbhum]
14	**لحم "Meat"/laħm/**	**[laham]**	**[lahmi]**	**[lahamna]**	**[lahmik]**	**[lahmitʃ]**	**[lahamkum]**	**[lahma]**	**[lahamha]**	**[lahamhum]**
15	**فضل "Bounty"/fadˤl/**	**[faðˤil]**	**[faðˤli]**	**[faðˤilna]**	**[faðˤlik]**	**[faðˤlitʃ]**	**[faðˤilkum]**	**[faðˤla]**	**[faðˤilha]**	**[faðˤilhum]**
16	**رأس "Head"/raʔs/**	**[raas]**	**[raasi]**	**[raasna]**	**[raasik]**	**[raasitʃ]**	**[raaskum]**	**[raasa]**	**[raasha]**	**[raashum]**
17	قلب "Heart"/qalb/	[galʕb]	[galʕbi]	[galʕbna]	[galʕbik]	[galʕbitʃ]	[galʕbkum]	[galʕba]	[galʕbha]	[galʕbhum]
18	شر "evil"/ʃarr/	[ʃar]	[ʃarri]	[ʃarna]	[ʃarrik]	[ʃarritʃ]	[ʃarkum]	[ʃarra]	[ʃarha]	[ʃarhum]
19	شيء "Thing"/ʃajʔ/	[ʃaj]	[ʃajji]	[ʃajna]	[ʃajjik]	[ʃajjitʃ]	[ʃajkum]	[ʃajja]	[ʃajha]	[ʃajhum]
20	أرض "Earth"/ʔardˤ/	[ʔarðˤ]	[ʔarðˤi]	[ʔarðˤna]	[ʔarðˤik]	[ʔarðˤitʃ]	[ʔarðˤkum]	[ʔarðˤa]	[ʔarðˤha]	[ʔarðˤhum]

Table: 5.1 KħA-CaCC stems

N	Word	CuCC	CuCC+1		CuCC+2			CuCC+3		
			Sing	Plur	Sing+Masc	Sing+Fem	Plur	Sing+Masc	Sing+Fem	Plur
1	أخت "Sister"/ʔuxt/	[ʔix*i*t] [ʔixt]	[ʔixti] s	[ʔix*i*tna] [ʔixtna]	[ʔixtik]	[ʔixtiʧ]	[ʔix*i*tkum] [ʔixtkum]	[ʔixta]	[ʔix*i*tha] [ʔixtha]	[ʔix*i*thum] [ʔixthum]
2	جزء "Part"/ʒuzʔ/	[ʒuzʔ] [ʒuz*u*w̱]	[ʒizʔi]	[ʒizʔna]	[ʒizʔik]	[ʒizʔiʧ]	[ʒizʔkum]	[ʒizʔa]	[ʒizʔha]	[ʒizʔhum]
3	ملك "Clouts"/mulk/	[mulk]	[milki]	[milkna]	[milkik]	[milkiʧ]	[milkkum]	[milka]	[milkha]	[milkhum]
4	**بخل "Avarice"/buxl/**	**[bux*u*l]**	**[buxli]**	**[bux*u*lna]**	**[buxlik]**	**[buxliʧ]**	**[bux*u*lkum]**	**[buxla]**	**[bux*u*lha]**	**[bux*u*lhum]**
5	**ركن "Backlog"/rukn/**	**[rik*i*n]**	**[rikni]**	**[rik*i*nna]**	**[riknik]**	**[rikniʧ]**	**[rikinkum]**	**[rikna]**	**[rik*i*nha]**	**[rik*i*nhum]**
6	**كفر "Disbelief"/kufr/**	**[kuf*u*r]**	**[kufri]**	**[kuf*u*rna]**	**[kufrik]**	**[kufriʧ]**	**[kufurkum]**	**[kufra]**	**[kuf*u*rha]**	**[kuf*u*rhum]**
7	ظلم "Injustice"/ðˤulm/	[ðˤulˤm]	[ðˤulˤmi]	[ðˤulˤmna]	[ðˤulˤmik]	[ðˤulˤmiʧ]	[ðˤulˤmkum]	[ðˤulˤma]	[ðˤulˤmha]	[ðˤulˤmhum]
8	**شكر "Gratitude"/ʃukr/**	**[ʃuk*u*r]**	**[ʃukri]**	**[ʃuk*u*rna]**	**[ʃukrik]**	**[ʃukriʧ]**	**[ʃukurkum]**	**[ʃukra]**	**[ʃuk*u*rha]**	**[ʃuk*u*rhum]**
9	كره "Hate"/kurh/	[kirh]	[kirhi]	[kirhna]	[kirhik]	[kirhiʧ]	[kirhkum]	[kirha]	[kirhha]	[kirhhum] [kirhum]
10	عرف "Custom"/ʕurf/	[ʕurf]	[ʕurfi]	[ʕurfna]	[ʕurfik]	[ʕurfiʧ]	[ʕurfkum]	[ʕurfa]	[ʕurfha]	[ʕurfhum]
11	رعب "Fright"/ruʕb/	[ruʕb]	[ruʕbi]	[ruʕbna]	[ruʕbik]	[ruʕbiʧ]	[ruʕbkum]	[ruʕba]	[ruʕbha]	[ruʕbhum]
12	**دهن "Fat"/duhn/**	**[dih*i*n]**	**[dihni]**	**[dih*i*nna]**	**[dihnik]**	**[dihniʧ]**	**[dihinkum]**	**[dihna]**	**[dih*i*nha]**	**[dih*i*nhum]**
13	**صبح "Morning"/sˤubh/**	**[sˤubh]**	**[sˤubhi]**	**[sˤubhna]**	**[sˤubhik]**	**[sˤubhiʧ]**	**[sˤubhkum]**	**[sˤubha]**	**[sˤubhha]**	**[sˤubhhum]**
14	**حكم "Ruling"/ħukm/**	**[ħuk*u*m]**	**[ħukmi]**	**[ħukumna]**	**[ħukmik]**	**[ħukmiʧ]**	**[ħukumkum]**	**[ħukma]**	**[ħuk*u*mha]**	**[ħuk*u*mhum]**
15	**عذر "Excuse"/ʕuðr/**	**[ʕið*i*r]**	**[ʕiðri]**	**[ʕiðirna]**	**[ʕiðrik]**	**[ʕiðriʧ]**	**[ʕiðirkum]**	**[ʕiðra]**	**[ʕið*i*rha]**	**[ʕið*i*rhum]**
16	صلح "Conciliation"/sˤulħ/	[sˤilħ]	[sˤilħi]	[sˤilħna]	[sˤilħik]	[sˤilħiʧ]	[sˤilħkum]	[sˤilħa]	[sˤilħha]	[sˤilħhum]
17	**وسع "Capability"/wusʕ/**	**[wisʕ]**	**[wisʕi]**	**[wisʕna]**	**[wisʕik]**	**[wisʕiʧ]**	**[wisʕkum]**	**[wisʕa]**	**[wisʕha]**	**[wisʕhum]**
18	**حزن "Grief"/ħuzn/**	**[hiz*i*n]**	**[hizni]**	**[hiz*i*nna]**	**[hiznik]**	**[hizniʧ]**	**[hizinkum]**	**[hizna]**	**[hiz*i*nha]**	**[hiz*i*nhum]**
19	صنع "Manufacture"/sˤunʕ/	[sˤinʕ]	[sˤinʕi]	[sˤinʕna]	[sˤinʕik]	[sˤinʕiʧ]	[sˤinʕkum]	[sˤinʕa]	[sˤinʕha]	[sˤinʕhum]
20	**حسن "Beauty"/ħusn/**	**[his*i*n]**	**[hisni]**	**[his*i*nna]**	**[hisnik]**	**[his*i*niʧ]**	**[his*i*nkum]**	**[hisna]**	**[his*i*nha]**	**[his*i*nhum]**

Table: 5.2 KħA-CuCC stems

N	Word	CiCC	CiCC+1		CiCC+2			CiCC+3		
			Sing [-i]	Plur [-na]	Sing+Masc [-ik]	Sing+Fem [-itʃ]	Plur [-kum]	Sing+Masc [-a]	Sing+Fem [-ha]	Plur [-hum]
1	ضعف "Double"/dˤiʕf/	[ðˤiʕf]	[ðˤiʕfi]	[ðˤiʕfna]	[ðˤiʕfik]	[ðˤiʕfitʃ]	[ðˤiʕfkum]	[ðˤiʕfa]	[ðˤiʕfha]	[ðˤiʕfhum]
2	صدق "truth"/sˤidq/	[sˤiʒ]	[sˤiʒʒi]	[sˤiʒna]	[sˤiʒʒik]	[sˤiʒʒitʃ]	[sˤiʒkum]	[sˤiʒʒa]	[sˤiʒha]	[sˤiʒhum]
3	جذع "Bole"/ʒiðʕ/	[ʒiðʕ]	[ʒiðʕi]	[ʒiðʕna]	[ʒiðʕik]	[ʒiðʕitʃ]	[ʒiðʕkum]	[ʒiðʕa]	[Ʒiðʕha]	[ʒiðʕhum]
4	حزب "Cabal"/ħizb/	[ħizb]	[ħizbi]	[ħizbna]	[ħizbik]	[ħizbitʃ]	[ħizbkum]	[ħizba]	[ħizbha]	[ħizbhum]
5	مسك "Muskiness"/misk/	[misk]	[miski]	[miskna]	[miskik]	[miskitʃ]	[miskkum]	[miska]	[miskha]	[miskhum]
6	**بئر "Well"/biʔr/**	**[biir]**	**[biiri]**	**[biirna]**	**[biirik]**	**[biiritʃ]**	**[biirkum]**	**[biira]**	**[biirha]**	**[biirhum]**
7	**ذنب "Wolf"/ðiʔb/**	**[ðiib]**	**[ðiibi]**	**[ðiibna]**	**[ðiibik]**	**[ðiibitʃ]**	**[ðiibkum]**	**[ðiiba]**	**[ðiibha]**	**[ðiibhum]**
8	**إذن "Permission"/ʔiðin/**	**[ʔiðin]**	**[ʔiðni]**	**[ʔiðinna]**	**[ʔiðnik]**	**[ʔiðnitʃ]**	**[ʔiðinkum]**	**[ʔiðna]**	**[ʔiðinha]**	**[ʔiðinhum]**
9	قسط "Justice"/qistˤ/	[qasˤtˤ]	[qasˤtˤi]	[qasˤtˤna]	[qasˤtˤik]	[qasˤtˤitʃ]	[qasˤtˤkum]	[qasˤtˤa]	[qasˤtˤha]	[qasˤtˤhum]
10	**عجل "Calf"/ʕiʒl/**	**[ʕiʒl]** **[ʕiʒil]**	**[ʕiʒli]**	**[ʕiʒilna]**	**[ʕiʒlik]**	**[ʕiʒlitʃ]**	**[ʕiʒilkum]**	**[ʕiʒla]**	**[ʕiʒilha]**	**[ʕiʒilhum]**
11	علم "Science/knowledge"/ʕilm/	[ʕilm]	[ʕilmi]	[ʕilmna]	[ʕilmik]	[ʕilmitʃ]	[ʕilmkum]	[ʕilma]	[ʕilmha]	[ʕilmhum]
12	**فعل "Action"/fiʕl/**	**[fiʕil]**	**[fiʕli]**	**[fiʕilna]**	**[fiʕlik]**	**[fiʕlitʃ]**	**[fiʕilkum]**	**[fiʕla]**	**[fiʕilha]**	**[fiʕilhum]**
13	ملح "Salt"/milħ/	[milħ]	[milħi]	[milħna]	[milħik]	[milħitʃ]	[milħkum]	[milħa]	[milħha]	[milħhum]
14	رزق "Livelihood"/rizq/	[rizg]	[rizgi]	[rizgna]	[rizgik]	[rizgitʃ]	[rizgkum]	[rizga]	[rizgha]	[rizghum]
15	**سحر "Magic"/sihr/**	**[sihir]**	**[sihri]**	**[sihirna]**	**[sihrik]**	**[sihritʃ]**	**[sihirkum]**	**[sihra]**	**[sihirha]**	**[sihirhum]**
16	**رجل "Leg"/riʒl/**	**[riil]**	**[riili]**	**[riilna]**	**[riilik]**	**[riilitʃ]**	**[riilkum]**	**[riila]**	**[riilha]**	**[riilhum]**
17	**كبر "Vanity"/kibr/**	**[kibir]**	**[kibri]**	**[kibirna]**	**[kibrik]**	**[kibritʃ]**	**[kibirkum]**	**[kibra]**	**[kibirha]**	**[kibirhum]**
18	**سجن "Prison"/siʒn/**	**[siʒin]**	**[siʒni]**	**[siʒinna]**	**[siʒnik]**	**[siʒnitʃ]**	**[siʒinkum]**	**[siʒna]**	**[siʒinha]**	**[siʒinhum]**
19	**شعر "Poetry"/ʃiʕr/**	**[ʃiʕir]**	**[ʃiʕri]**	**[ʃiʕirna]**	**[ʃiʕrik]**	**[ʃiʕritʃ]**	**[ʃiʕirkum]**	**[ʃiʕra]**	**[ʃiʕirha]**	**[ʃiʕirhum]**
20	دفء "Warmth"/difʔ/	[difa]	*[difaaj]*	*[difaana]*	*[difaak]*	*[difaatʃ]*	*[difaakum]*	*[difaah]*	*[difaaha]*	*[difaahum]*

Table: 5.3 KħA-CiCC stems

Appendix 6

MMA

N	Word	CaCC	CaCC+1Pers		CaCC+2Pers		CaCC+3Pers		
			Sing [-i]	Plur [-na]	Sing [-ik]≈[-ak]	Plur [-kum]	Sing+Masc [-u]	Sing+Fem [-ha]	Plur [-hum]
1	نفس "Self"/nafs/	[nafs]	[nifs-i]	[nifs-na]	[nifs-ik]	[nifs-kum]	[nifs-u]	[nifs-ha]	[nifs-hum]
2	وعد "promise"/waʕd/	[waʕd]	[waʕd-i]	[waʕid-na]	[wiʕd-ik]	[waʕid-kum]	[wiʕd-u]	[waʕid-ha]	[wiʕid-hum]
3	**شهر "Month"/ʃahr/**	**[ʃhar]**	**[ʃhr-i]**	**[ʃhar-na]**	**[ʃhar-ik]**	**[ʃhar-kum]**	**[ʃhar-u]**	**[ʃhar-ha]**	**[ʃhar-hum]**
4	سبت "Saturday"/sabt/	[sibt]	[sibt-i]	[sibt-na]	[sibt-ik]	[sibt-kum]	[sibt-u]	[sibt-ha]	[sibt-hum]
5	برق "Lightning"/barq/	[braq]	[barq-i]	[barq-na]	[barq-ak]	[barq-kum]	[barq-u]	[barq-ha]	[barq-hum]
6	**بحر "Sea"/baħr/**	**[bħar]**	**[baħr-i]**	**[bħar-na]**	**[baħr-ak]**	**[bħar-kum]**	**[baħr-u]**	**[bħar-ha]**	**[bħar-hum]**
7[2]	زوج "Spouse"/zawʒ/	[zuuʒ]						[zuuʒ-ha]	
8	وجه "Face"/waʒh/	[uʒih] [wiʒih]	[wiʒh-i]	[wiʒih-na]	[wiʒh-ik]	[wiʒih-kum]	[wiʒh-u]	[wiʒih-ha]	[wiʒih-hum]
9[3]	**غلي "Boil"/ɣalj/**	**[ɣla]**							
10	زرع "Crop"/zarʕ/	[zraʕ]	[zarʕ-i]	[zarʕ-na]	[zarʕ-ak]	[zraʕ-kum]	[zarʕ-u]	[zarʕ-ha]	[zarʕ-hum]
11	حرف "Edge"/ħarf/	[ħarf]	[ħarf-i]	[ħarf-na]	[ħarf-ak]	[ħarf-kum]	[ħarf-u]	[ħarf-ha]	[ħarf-hum]
12	رعد "Thunder"/raʕd/	[raʕda]	[raʕd-i]	[raʕid-na]	[raʕd-ak]	[raʕd-kum]	[raʕd-u]	[raʕid-ha]	[raʕd-hum]
13	كلب "Dog"/kalb/	[kilb]	[kilb-i]	[kilb-na]	[kilb-ik]	[kilb-kum]	[kilb-u]	[kilb-ha]	[kilb-hum]
14	**لحم "Meat"/laħm/**	**[lħam]**	**[laħm-i]**	**[lħam-na]**	**[laħm-ik]**	**[lħam-kum]**	**[laħm-u]**	**[laħam-ha]**	**[lħam-hum]**
15	**فضل "Bounty"/fadˤl/**	**[fdˤal]**	**[fadˤl-i]**	**[fdˤil-na]**	**[fadˤl-ik]**	**[fdˤal-kum]**	**[fadˤl-u]**	**[fdˤil-ha]**	**[fdˤal-hum]**
16	**رأس "Head"/raʔs/**	**[raas]**	**[raas-i]**	**[raas-na]**	**[raas-ak]**	**[raas-kum]**	**[raas-u]**	**[raas-ha]**	**[raas-hum]**
17	قلب "Heart"/qalb/	[qalb]	[qalb-i]	[qalb-na]	[qalb-ik]	[qalb-kum]	[qalb-u]	[qalb-ha]	[qalb-hum]
18	شر "evil"/ʃarr/	[ʃar]	[ʃarr-i]	[ʃar-na]	[ʃarr-ik]	[ʃarri-kum]	[ʃarr-u]	[ʃar-ha]	[ʃar-hum]
19[4]	شيء "Thing"/ʃajʔ/	[ʃi]							
20	أرض "Earth"/ʔardˤ/	[ʔardˤ]	[ʔardˤ-i]	[ʔardˤ-na]	[ʔardˤ-ik]	[ʔardˤ-kum]	[ʔardˤ-u]	[ʔardˤ-ha]	[ʔardˤ-hum]

Table: 5.1 MMA-CaCC stems

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[2] Instead of this word they utilize the word [raaʒil] and its paradigm. This word means "man" in the classical era and it surfaces as [raʒul-V].

[3] I had the impression that this is a verb structure not a nominal. I enquired to ascertain whether I am correct in my impression but I am not sure that I was understood.

[4] Instead, they use [ħaaʒa] which in the classical era it means "a need".

N	Word	CuCC	CuCC+1 Sing [-i]	CuCC+1 Plur [-na]	CuCC+2 Sing+Masc [-ik]≈[-ak]≈[uk]	CuCC+2 Plur [-kum]	CuCC+3 Sing+Masc [-u]	CuCC+3 Sing+Fem [-ha]	CuCC+3 Plur [-hum]
1	أخت "Sister"/ʔuxt/	[xit] [xut]	[xt-i]	[xt-na]	[xt-uk]	[xt-kum]	[xt-u]	[xt-ha]	[xt-hum]
2	جزء "Part"[1]/ʒuzʔ/	[ʒuzʔ]			[ʒuzʔ-ik]	[ʒuzu ʔ-kum]			
3	ملك "Clouts"/mulk/	[milk]	[milk-i]	[milk-na]	[milk-ik]	[mil-kum]	[milk-u]	[milk-ha]	[milk-hum]
4	**بخل "Avarice"[2]/buxl/**	**[buxul]**			**[buxl-ak]**		**[buxl-u]**	**[buxul-ha]**	**[buxul-hum]**
5	**ركن "Backlog"[3]/rukn/**	**[rukun] [rukn]**	**[rukn-i]**	**[rikin-na]**	**[rukun-uk]**		**[rikn-u]**	**[rukin-ha]**	**[rikun-hum]**
6	**كفر "Disbelief"/kufr/**	**[kufur]**	**[kufr-i]**	**[kfar-na]**	**[kufr-ak]**	**[kufur-kum]**	**[kufr-u]**	**[kufur-ha]**	**[kufur-hum]**
7	ظلم "Injustice"/ðˤulm/	[dˤulm]	[dˤulm-i]	[dˤulm-na]	[dˤulm-ak]	[dˤulm-kum]	[dˤulm-u]	[dˤulm-ha]	[dˤulm-hum]
8	**شكر "Gratitude"/ʃukr/**	**[ʃukur]**	**[ʃukr-i]**	**[ʃkir-na]**	**[ʃukr-ik]**	**[ʃkur-kum]**	**[ʃukr-u]**	**[ʃikir-ha]**	**[ʃukir-hum]**
9	كره "Hate"/kurh/	[kurh]	[kirh-i]	[kirh-na]	[kirh-ak]	[kuruh-kum]	[kirh-u]	[kurh-ha]	[kirh-hum]
10	عرف "Custom"/ʕurf/	[ʕurf]	[ʕurf-i]	[ʕurf-na]	[ʕarf-ak]	[ʕurf-kum]	[ʕurf-u]	[ʕurf-ha]	[ʕurf-hum]
11	رعب "Fright"/ruʕb/	[ruʕb]	[ruʕb-i]	[ruʕb-na]	[riʕb-ak]	[ruʕb-kum]	[ruʕb-u]	[raʕb-ha]	[ruʕb-hum]
12	**دهن "Fat"[4]/duhn/**	*[dhaan]*	*[dahn-i]*	*[dhaan-na]*	[dihn-ik]		[dihn-u]	*[dhaan-ha]*	*[dhaan-hum]*
13	**صبح "Morning"[5]/sˤubh/**	*[sˤabaah]*	*[sˤbaah-i]*	*[sˤbaah-na]*	*[sˤbaah-ik]*	*[sˤbaah-kum]*	*[sˤbaah-u]*	*[sˤbaah-ha]*	*[sˤbaah-hum]*
14	**حكم "Ruling"/hukm/**	**[hukum]**	**[hikm-i]**	**[hikim-na]**		**[hukum-kum]**	**[hikm-u]**	**[hikim-ha]**	**[hikim-hum]**
15	**عذر "Excuse"/ʕuðr/**	**[ʕudir]**	**[ʕudr-i]**	**[ʕudir-na]**	**[ʕadr-ik]**	**[ʕudir-kum]**	**[ʕudr-u]**	**[ʕidira-ha]**	**[ʕudir-hum]**
16	صلح "Conciliation"/sˤulh/	[sˤulħ]	[sˤulħ-i]	[sˤulħ-na]	[sˤilħ-ak]	[sˤulħ-kum]	[sˤilħ-u]	[sˤilħ-ha]	[sˤilħ-hum]
17	**وسع "Capability"/wusʕ/**	**[wisiʕ]**	**[wisʕ-i]**	**[wisiʕ-na]**	**[wisʕ-ak]**	**[wisiʕ-kum]**	**[wisʕ-u]**	**[wisiʕ-ha]**	**[wisiʕ-hum]**
18	**حزن "Grief"/huzn/**	**[huzn]**	**[huzn-i]**	**[hizin-na]**	**[hizn-ak]**	**[huznu-kum]**	**[hizn-u]**	**[hizin-ha]**	**[hizin-hum]**
19	صنع "Manufacture"/sˤunʕ/	[sˤunʕ]	[sˤunʕ-i]	[sˤinʕ-na]	[sˤinʕ-ak]	[sˤunʕ-kum]	[sˤinʕ-u]	[sˤinʕ-ha]	[sˤinʕ-hum]
20	**حسن "Beauty"/husn/**	**[husn]**	**[hisn-i]**	**[hisin-na]**	**[husn-ak]**	**[husin-kum]**	**[hisn-u]**	**[husn-ha]**	**[hisin-hum]**

Table: 5.2 MMA-CuCC stems

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[1] The investigated word is not used in the dialect.
[2] The investigated word is substituted with [siqraam].
[3] The investigated word is substituted with [qint].
[4] The investigated word is substituted with a word that belongs to the word-family of the investigated string.
[5] The investigated word is substituted with a word that belongs to the word-family of the investigated string.

N	Word	CiCC	CiCC+1		CiCC+2			CiCC+3	
			Sing [-i]	Plur [-na]	Sing [-ak]≈[ik]	Plur [-kum]	Sing+Masc [-u]	Sing+Fem [-ha]	Plur [-hum]
1	ضعف "Double"[6]/dˤiʕf/	[dˤiʕf]	[dˤiʕf-i]	[dˤiʕf-na]	[dˤiʕf-ak]		[dˤiʕf-u]	[dˤiʕf-ha]	[dˤiʕf-hum]
2	صدق "Authenticity"/sˤidq/	[sˤidq]	[sˤidq-i]	[sˤidq-na]	[sˤidq-ak]	[sˤidq-kum]	[sˤidq-u]	[sˤidq-ha]	[sˤidq-hum]
3	جذع "Bole"/ʒidʕ/	[ʒdaʕ]	[ʒdiʕ-i]	[ʒdaʕ-na]	[ʒdaʕ-ik]	[ʒdaʕ-kum]	[ʒdaʕ-u]	[ʒdaʕ-ha]	[ʒdaʕ-hum]
4	حزب "Cabal"/ħizb/	[ħizb]	[ħizb-i]	[ħizb-na]	[ħizb-ak]	[ħizb-kum]	[ħizb-u]	[ħizb-ha]	[ħizb-hum]
5	مسك "Muskiness"/misk/	[misk]	[misk-i]	[misk-na]	[misk-ak]	[mis-kum]	[misk-u]	[misk-ha]	[misk-hum]
6	بئر "Well"/biʔr/	[biir]	[biir-i]	[biir-na]	[biir-ik]	[biir-kum]	[biir-u]	[biir-ha]	[biir-hum]
7	ذئب "Wolf"/ðiʔb/	[diib]	[diib-i]	[diib-na]	[diib-ik]	[diib-kum]	[diib-u]	[diib-ha]	[diib-hum]
8	إذن "Permission"[7]/ʔiðn/	[ʔidn]	[ʔidn-i]	[ʔidin-na]	[ʔidn-ak]	[ʔidn-kum]	[ʔidn-u]		[ʔidn-hum]
9	قسط "Justice"/qistˤ/	[qisˤtˤ]	[qisˤtˤ-i]	[qisˤtˤ-na]	[qisˤtˤ-ak]	[qisˤtˤ-kum]	[qisˤtˤ-u]		[qisˤtˤ-hum]
10	عجل "Calf"/ʕiʒl/	[ʕiʒil]	[ʕiʒl-i]	[ʕiʒil-na]	[ʕiʒl-ak]	[ʕiʒil-kum]	[ʕiʒl-u]	[ʕiʒil-ha]	[ʕiʒil-hum]
11	علم "Science/knowledge"/ʕilm/	[ʕilm]	[ʕilm-i]	[ʕilm-na]	[ʕilm-ik]	[ʕilm-kum]	[ʕilm-u]	[ʕilm-ha]	[ʕilm-hum]
12	فعل "Action"/fiʕl/	[fʕil]	[fiʕl-i]	[fʕil-na]	[fiʕl-ik]	[fiʕil-kum]	[fiʕl-u]	[fiʕila-ha]	[fiʕil-hum]
13	ملح "Salt"/milħ/[8]	[malħa] [milħ]	[milħ-i]	[milħ-na]	[milħ-ik]	[milħ-kum]	[milħ-u]	[milħ-ha]	[milħ-hum]
14	رزق "Livelihood"/rizq/	[rzaq]	[razq-i]	[rzaq-na]	[rizq-ak]	[rziq-kum]	[rizq-u]	[rziq-ha]	[rziq-hum]
15	سحر "Magic"/sihr/	[shar]	[sihr-i]	[shir-na]	[sihr-ik]	[shar-kum]	[sihr-u]	[shir-ha]	[shir-hum]
16	رجل "Leg"/riʒl/	[rʒil]	[riʒl-i]	[rʒil-na]	[riʒl-ik]	[rʒil-kum]	[riʒl-u]	[rʒil-ha]	[rʒil-hum]
17	كبر "Vanity"/kibr/	[kibir]				[kibir-kum]			
18	سجن "Prison"[9]/siʒn/	[siʒin]	[siʒn-i]	[siʒin-na]	[siʒn-ik]	[siʒin-kum]		[siʒin-ha]	
19	شعر "Poetry"/ʃiʕr/	[ʃiʕir]	[ʃiʕr-i]	[ʃiʕir-na]	[ʃiʕr-ik]	[ʃiʕir-kum]	[ʃiʕr-u]	[ʃiʕir-ha]	[ʃiʕir-hum]
20	دفء "Warmth"[10]/difʔ/	[dafa]	[difʔ-i]	[difiʔ-na]	[difʔ-ak] [dfaak]	[dfaa-kum]	[dfaah]	[dfaa-ha]	[dfaa-hum]

Table: 5.3 MMA-CiCC stems

[6] Instead the investigated word they use [ddubl].

[7] They do not use the investigated word.

[8] I was informed that the form [malħha] substitute [malħ] in the dialect.

[9] I was informed that instead of the investigated word they would use [ħabs].

[10] I was informed that the paradigm of this word is not used in this dialect.

Appendix 7

This is a page copied from the dictionary of Alkhatiib, A. 2002. *Muʕjam Alqiraaʔaat*. Damascus: Daar Saʕd Alddiin. This is the source that was used to collect the classical data. The illustrations in blue are provided by me.

Page number

Chapter name & number

Chapter name — (١) — *Chapter number*

Verses numbers — *The verses*

What is said about the verses

citations

٣ — ١ سُورَةُ الفَاتِحَةِ

سُورَةُ الفَاتِحَةِ

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ ①

الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ ②

بِسْمِ اللَّهِ قرئ في الشواذ «بِسْمَى اللَّهِ...»(١) على وزن «هُدى»، وهو لغة في الاسم.

الرَّحِيمِ، الْحَمْدُ

قرأ قوم من الكوفيين بسكون الميم «الرحيمْ ألحمدُ»(٢) يقفون عليها، ويبتدئون بهمزة مقطوعة، وروت هذا أم سلمة عن النبيّ ﷺ.
ـ والجمهور على جَرِّ الميم ووصل الألف من الحمد «الرحيم الْحمدُ»(٣).
ـ وحكى الكسائي عن بعض العرب أنه يقرأ: «الرحيمَ الحمدُ»(٤) بفتح الميم وصلة الألف، كأنك سكّنت الميم، وقطعت الألف، ثم ألقيت حركتها على الميم وحذفتَ.
وذكر ابن عطية أنها لم ترد قراءة عن أحد فيما علم.
ـ قرأ الجمهور «الحمدُ لِلَّهِ»(٥) بضم الدال.
قال الفرّاء: ـ اجتمع القراء على رفع «الحمد»، وروي عن ابن عباس أنه قال: «الرفع هو القراءة»؛ لأنه المأثور، وهو الاختيار في العربية.

الْحَمْدُ لِلَّهِ

(١) تاج العروس/ سمو، بصائر ذوي التمييز:اسم.
(٢) البحر ١/١٨، المحرر ١/٩٣، ابن كثير ١/٢١، القرطبي ١/١٠٧، إيضاح الوقف الابتداء/٤٥٣.
(٣) البحر ١/١٨، إيضاح الوقف والابتداء/٤٥٣ «بخفض الميم لسكونها وسكون اللام في الحمد» فتسقط ألف «الحمد» للوصل، المحرر ١/٩٣.
(٤) البحر ١/١٨، ونص أبي حيان في المحرر ١/٩٣، وانظر الإنصاف/٧٤٣، والقرطبي ١/١٠٧، وإيضاح الوقف والابتداء/٤٥٤، وشرح الشافية ٢/٢٣٨.
(٥) البحر ١/١٨، معاني الفراء ١/٣، التبيان ١/٣٠، الخصائص ٢/١٤٤، إعراب ثلاثين سورة/١٩، اللسان والتاج والتهذيب/ حمد، الطبري ١/٤٧، المحرر ١/٩٩، زاد المسير ١/١٠.

Appendix 8

In this appendix I provide a list of the name of constraints (boldfaced) that are assumed in the analysis that is presented in chapter five.

DEP$^\mu$ (final version)
        Let μ be a mora in the output.
        DEP$^\mu$ = (a)$\wedge$(b)
        (c) μ has a correspondent in the input.
        (d) μ is a positional μ-licenser.

DEP^{vowel}: Output vowels must have input correspondents.

IDENT$^\mu$ (final version)
        Let α be a segment in the input.
        Let β be a correspondent of α in the output.
        Let α be linked to n morae.
        IDENT$^\mu$ = (a)$\wedge$(b)
        (c) β is linked to n morae.
        (d) β is positionally μ-licensed.

*BRANCH: A mora should not dominate more than one root-node.

*μ/OBS: A mora must be headed by an obstruent.

*μ/SON: A mora must be headed by a sonorant consonant.

LEXICAL MORACONSERVATISM (Lex μ)

   Let nP be a potential novel phonological property in T word.
   Let mora μ be a stranded μ of α lexical deleted segment in T.
   If the stranded μ can prevent nP, then stranded μ is a mora that undergoes conservatism $\not{V}^\mu$.

*EMPTYV: The output representations should not contain vowels lacking oral feature.

*CVCC: All CVCC syllables are prohibited.

*CuCC: The superheavy CuCC syllabic type is prohibited.

*CaCC: The superheavy CaCC syllabic type is prohibited.

*CiCC: The superheavy CiCC syllabic type is prohibited.

WEAKC: Demands the extrasyllabicity of only one consonant.

WEAKC^{CaCC}+^{CiCC}: Demands the extrasyllabicity of only one consonant in only CaCC and CiCC syllables.

WEAKC^{CaCC}: Demands the extrasyllabicity of only one consonant in only CaCC syllable.

WEAKC$^{\text{CVVC}}$: Demands the extrasyllabicity of only one consonant in only CVVC syllable.

PARSE$^{\text{Seg}}$: Every segment must be dominated either by a mora node or by a syllable node.

*σ$_{\mu\mu\mu}$: Syllables are maximally bimoraic.

σ≤ 2μ: Syllables do not exceed two moras.

σ$_{\mu\mu}$=2μ: Heavy syllables minimally have two morae.

SONSEQ: Complex onsets rise in sonority and complex codas fall in sonority.

SONSEQ$^{\text{CuCC}}$: Complex onsets rise in sonority and complex codas fall in sonority only in CuCC syllable.

*[$_{\sigma}$CC: Onset comprises no more than one segment.

*GLOTTAL: Glottal consonants are prohibited.

*GLOTTAL$^{\text{ʔ}}$: The glottal stop consonant is prohibited

LINEARITY: The sequential ordering segments in the input must be reflected in the output.

LINEARITY$^{\text{ACC}}$: The sequential ordering segments in the input must be reflected in the output of the accusative suffix.

LINEARITY$^{\text{root}}$: The sequential ordering segments in the root of the input must be reflected in the root of the output.

MAX$^{\mu}$: Each mora in the input has a correspondent in the output.

MAX$^{\text{Seg}}$: Input segment must have output correspondents.

MAX$^{\text{vowel}}$: Input vowels must have output correspondents.

No [eV]: Realizing an epenthetic vowel in a light syllable is prohibited.

No [Ev]: Realizing an epenthetic vowel in heavy syllables is prohibited.

*MorphSub: Morphological substitutions are prohibited.

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