The Metrical Structure of the Qur'anic Verses with Reference to /ʔæl fælæq/ and /ʔæn nɑ:s/ Chapters

التركيب المتري للآيات القرانية بالاشارة الى سورتي الفلق والناس

Prof. Balqis I. G. Rashid (Ph.D.) **Ethar Nooruddeen Jameel**
Department of English
The College of Education for Human Sciences
University of Basrah

Abstract

The present study attempts to analyse the words and the verses of the last two Qur'anic chapters metrically according to Hayes's (1995) metrical theory. This theory assumes that word stress assignment in any language can be accomplished by setting the relevant parameters of that language. These parameters include quantity sensitivity, foot size, iterativity, direction of parsing, and foot dominance. Moreover, it assumes that the rhythmic structure of any language can be shown in the process of stress assignment by the use of the metrical grid model. The results of the study show that the analysis of Qur'anic word stress according to the parametric metrical theory is accomplished successfully by setting the relevant rules and parameters of the Qur'anic language. Moreover, the rhythmicity of the Qur'anic verses is shown by means of alternating stress pattern in the metrical grid representation with the aid of the relevant phrasal stress rules.

Keywords: metrical theory, metrical parameters, bracketed grid. extrametricality, Priority Clause Principle, syllable, foot, End Rule, BA rule, Move X, Eurhythmici

1-Introduction

The Holy Qur'an is the Divine Book of Muslims that was revealed gradually to the Prophet Muhammad (PBUH&HH)[1] along twenty- three years of revelation from Almighty Allah. It is composed of one hundred and fourteen chapters, each chapter is called a 'su:ræ' that has a number of verses which are referred to as 'ʔɑ:jæh(singular)'. The Qur'anic language is part of Classical Arabic (henceforth CA) which is also the language of the pre-Islamic literature. Al-Izerjawi (2003, p.146) describes Arabic as a musical language. The musicality of the Qur'anic Arabic is best embodied in the structure of verse –final words which are called /fɑ:sˁɪlæ/(singular). Albu' (2009,p.5) defines the verse-final word as the final word of each verse similar to the word final rhyme in poetry and the final word in rhymed prose.

Along its literature, metrical stress theory has been used to investigate the stress

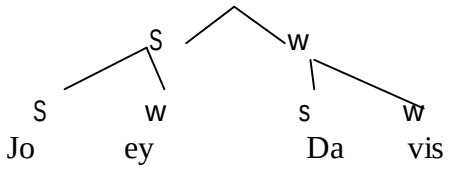
[1] (PBUH&HH): Peace be Upon him and His Household

systems of different Arabic dialects; however, this theory has not been used to investigate the stress of CA words and sentences whether Qur'anic or non- Qur'anic. As such, the present study is an attempt to analyse the stress of the Qur'anic words and verses of two short Qur'anic chapters, namely, /ʔæl fælæq/ "*the daybreak*", and /ʔæn nɑːs/ "*the mankind*". As the Qur'anic language is a rhythmic language, the present study is based on the hypothesis that the rhythmicity of /ʔæl fælæq/, and /ʔæn nɑːs/ verses is embodied in the alternating stress patterns of these verses shown in the metrical bracketed grids with the aid of phrasal stress rules.

2- Metrical Theory: Historical Background

Metrical theory came into existence in the mid 1970s, suggested by Liberman's doctoral dissertation as a part of a theory of intonation, then it was developed by other linguists such as Liberman and Prince(1977), Halle and Vergnaud (1978), Selkirk(1980), Hayes (1980), Prince (1983), Halle and Vergnaud (1987), Hayes (1995), among others. Metrical Theory is primarily a theory of stress which is considered as an improvement to the preceding studies that dealt with stress as a phonetic feature attached to individual segments (Al–Abdely, 2011, p.383)[2]. Al-Abdely (2011, p.383) asserts that metrical theory organizes segments into groups of relative prominence defined as syllables which constitute metrical feet, then the feet in turn form words and words form larger units.

The organizing principle of metrical theory, as Liberman (1975, p.45) argues, has been a metrical system which consists of two complementary parts: a theory of metrical patterns (trees), and a theory of metrical grids. Liberman (1975, p.49) defines metrical patterns as trees with a hierarchical organization, with node labels: S (strong) and W (weak) explaining that the notions 'strong' and 'weak' in metrical trees are basically relational. A position is strong not because of an inherent property of strength but by virtue of being associated with a corresponding weak position. A position is weak in relation to its corresponding strong position. In this way it is impossible to have metrical constituents such as [ww] or [ss]. In the tree below, both *Joey* and *Davis* possess [sw] structure which indicates that the first syllable of the two words is stronger than the second. These two words also function as part of a bigger structure in which *Joey* is stronger than *Davis*, hence this larger structure is represented by another [sw] relation.



Figure(1): The metrical tree of the phrase "Joey Davis" (Taken from Liberman (1975,p.49)

Inspired by musical rhythm, Liberman(1975,p.73) proposes the metrical grid model to express the alternating stress patterns between syllables defining the metrical grid

[2] The researchers have followed the APA style in in-text documentation and in the bibliography.

as "a pattern which subdivides intervals of time, in the way that is familiar from musical notation". Hayes and Puppel (1985, p.60) describe the metrical grid as "an abstract set of units arrayed in rows and columns. The height of the columns represents the stress prominence of syllables, while the rows may be viewed as series of rhythmic beats on different levels [layers]". The height of each column in the grid, McCarthy and Hayes (2003,p.55) assert, constitutes the stress layer of the syllable at its base; whereas, the phonological significance of the rows lies in their representation of sequences of rhythmic beats. In short, the vertical dimension of the grid represents prominence, while the horizontal dimension embodies rhythm (Kager, 1995, p.385).

An example of projecting a metrical grid from a metrical tree is shown below in figure (2); the tree form of "Mississippi mud" can be projected into grid by adding a row of Xs as a place marker, then adding additional Xs corresponding to the tree Ss on the next row to represent the foot layer. The process continues till reaching the highest layer which occupies the last X, i.e. the most prominent constituent in the phrase –(mud) in this phrase.

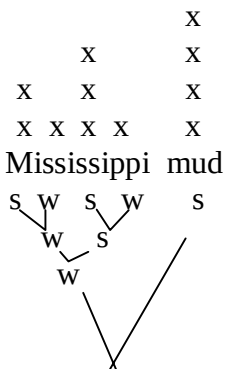


Figure (2): Projecting a Grid from the Tree of the Phrase "Mississippi mud"(Taken from Hayes and Puppel (1985, p.60)

To sum up, it has been shown that linguists either use both metrical trees and metrical grids as models for representing stress, or they prefer one of them to the other. This preference of the grid to tree or vice versa is related to the absence of a feature in one model and its presence in the other. As a result, due to the importance of both groupings and rhythm in the metrical analysis of stress, some linguists have devised ways of incorporating features of tree and grid in one representation like the bracketed grid model which is characterised by the inclusion of brackets in all layers. Hayes (1995, p.39) uses the bracketed grid model to represent stress. In this grid, every grid bracket holds only one grid mark which is the head of a constituent, while (.) is used to refer to unstressed syllables. Thus, Hayes's grid for "Mississippi mud" would be as follows:

(x)
(x) (x)
(x .) (x .) (x)
Mississippi mud

Figure (3): "Hayes's Grid of "Mississippi mud" Taken from Hayes(1995, p. 39)

3- Parametric Metrical Theory

Since the beginning of metrical theory, it has been based on the assumption that stress is the linguistic manifestation of rhythmic structure. Starting with Liberman (1975), he and all metrical phonologists who came after him tried to prove this assumption by adopting certain metrical rules and notations. Hayes(1980, 1995), as one of the pioneers in this field, develops a different version of metrical theory which he calls a parametric metrical theory. Hayes (1995, p.2) bases his parametric theory on the typology of rhythmically- based bounded stress rules. He considers the foot as the smallest metrical constituent which makes him build his theory on three foot types: moraic trochee, syllabic trochee and iamb assuming that this number of foot type is sufficient to account for a large number of asymmetries in bounded stress systems.

Graf (1999,p.26) points out that the minimal bracketed units in the parametric metrical theory are **feet** which represent the lowest metrical constituents grouped into higher layer constituents (words), which in turn, are grouped into higher units . Moreover, in a parametric theory, the stress system of any language constitutes a particular choice from a limited set of parameters. Graf (1999, p. 27) emphasizes that once the relevant parameters are set, the stress rules can be derived. She adds that Hayes (1995) develops a theory which includes a large number of attested stress systems with a restricted set of parameters. These parameters are: size, quantity sensitivity, labelling (dominance), direction of parsing, and iterativity.

4- Metrical Parameters

Metrical theory assumes a hierarchical organization of segments grouped into syllables, syllables into metrical feet, feet into words and words into phrases and sentences. According to Hayes(1995,p.2), the foot is the smallest metrical constituent; therefore, the parameters that Hayes establishes in his theory are all parameters related to metrical feet. These parameters are discussed below.

a- Size (Boundedness)

According to Hayes (1995), (Kager,1995, p. 370), metrical feet are maximally binary or unbounded. Boundedness refers to the distinction between stress systems in which stresses define a limited distance between each other and from the word edge, and stress systems that do not have such a restriction. The first system constructs feet of maximally two syllables only, while the second builds syllables of unrestricted size.

Hayes in his (1995) theory mainly deals with the bounded rhythmic stress systems, whereby the unbounded stress systems are less focused on. It is called unbounded because there is no restriction on the distance between the main stress and the word edge (Walker, 2000, pp.3-4).

According to Hayes (1995), the unbounded systems are described as systems of

"great interest because they appear to follow a universal pattern…"(p.33). This pattern is explicated by Prince's classification of the unbounded stress systems that distinguishes between default- to -opposite side systems, and default - to- same side systems. Accordingly, Prince (1985, p.474) identifies the universal stress pattern of the two types of unbounded systems as follows:

a) Default – to- Opposite Side

i) Main stress is put on the final heavy syllable, if there is no heavy syllable, it is put on the initial syllable.

ii) Main stress is put on the initial heavy syllable, if there is no heavy syllable, it is put on the final syllable.

b) *Default –to- Same Side*

i) Main stress is put on the initial heavy syllable, if there is no heavy syllable, it is put on the initial syllable.

ii) Main stress falls on the final heavy syllable, if there is no heavy syllable, it is put on the final syllable.

The main concern of the present study is the default –to- opposite side unbounded quantity sensitive stress system since the data used follows this type of stress systems, i.e. the Qur'anic language which is part of CA. To Hayes(1995),the way of building metrical structure for default –to-opposite side systems is different from that for default-to same side systems. Regarding the default- to- opposite type of unbounded systems, Hayes (1995) adopts the analysis suggested by Prince (1976). In Prince's analysis, an unbounded quantity –sensitive foot template is proposed. This foot is either right or left headed with light syllables occupying weak positions (Hayes, 1995, p.298). Figure (4) depicts this type of foot with the rightmost heavy, otherwise leftmost (the symbol ˘ refers to a light syllable and the symbol _ stands for a heavy one).

- Foot Construction — Form left –headed ,quantity –sensitive unbounded feet
- Word layer Construction — End Rule Right

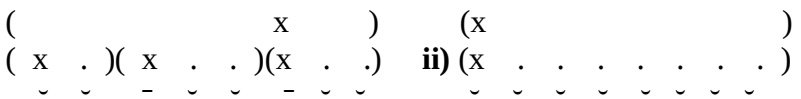


Figure (4) : " Metrical Analysis of Default –to Opposite (rightmost heavy, otherwise leftmost),"i" a word with heavy syllables , "ii" a word with only light syllables Taken from Hayes (1995,p.298)

The mirror image of the above foot is the "leftmost heavy, otherwise rightmost with right headed foot and End Rule Left" (Hayes, 1995, p.298).

b-Quantity Sensitivity

As far as stress assignment is concerned, languages are either quantity sensitive or insensitive. Quantity sensitivity is described by Kager (1995, pp.371-372) and Graf (1999,p.27) as the parameter that determines the way heavy and light syllables are distributed in terminal nodes of feet. So, when no restriction holds, and all syllables are treated as light or "equally heavy", the foot is quantity insensitive. In quantity sensitive feet, heavy syllables are stressed and may not be lodged in weak position.

c- Labelling (Dominance)

Under labelling parameter, Hayes (1995,p. 54) proposes that feet have either initial or final prominence. Graf (1999,p.28) remarks that this parameter determines the location of the head within the foot. Accordingly, left dominant feet show left – sided dominant heads while right dominant feet have right nodes as their heads

d- Direction of Parsing

This parameter determines the direction of foot parsing. According to Hayes (1985; as cited in: Al-Abdely, 2011,p.386), the process of foot construction starts from the left edge and continues rightward or from the right edge and goes on leftward. The direction of parsing becomes marked with words that have odd number of syllables. English, for example, parse syllables from left to right, CA, on the contrary, parse syllables from right to left.

e- Iterativity

Iterativity is another parameter of foot construction which determines whether feet are formed iteratively or non-iteratively. Kager(1995,p.373) and Graf(1999,p.28) state that in non- iterative systems, only one foot is created at the right or the left edge of the word. Baković (2004,p203) states that non-iterative feet can be found in unbounded stress systems in words with light syllables. Forms with heavy syllables; however, impose semi-iterative foot construction in languages with quantity sensitive stress systems. Moreover, Baković (2004, p.204) illustrates that forms which consist of only light syllables make a difference between bounded and unbounded systems: in unbounded systems a single foot is constructed at or near the word's edge, while bounded systems show an alternating stress pattern i.e. a foot is constructed at or near an edge then is assigned iteratively up to the opposite edge as exhibited by figure (5) below[3]:

a) ˈ
(σ σ σ σ σ σ)

b) ˈ ` `
(σ σ) (σ σ) (σ σ)

[3] The symbol (σ) in figure (5) above stands for a syllable, the second symbol (ˈ) indicates primary stress, and the third symbol (`) refers to secondary stresses.

Figure (5): (a) Non-iterative Unbounded Left Dominant Foot, (b) Iterative Binary Left Dominant Foot Taken from Baković (2004,p.204)

In figure (5) above, (a) refers to unbounded non- iterative left headed foot that consists of one stressed and five unstressed syllables, while (b) represents the bounded stress system in which each foot is composed of two syllables with a left syllable being the foot head. The head of the first foot represents the word's primary stress, other heads are the word's secondary stresses.

5-Metrical Rules and Principles

In the process of foot construction, in addition to setting a list of language specific parameters, there are rules that should be followed so as to be secured from having ill –formed metrical structure. Relevant to this study are five rules illustrated below, the first two are related to the grid well-formedness, whereas, the remaining three are rules of stress assignment applied during foot construction.

a- The Continuous Column Constraint

Following Prince's (1983, p.33) idea which says that "a column must have entries at every layer up to its peak", Hayes (1995, p.34)formulated a rule which he calls the Continuous Column Constraint (henceforth CoCoCo). The CoCoCo reads as follows: "*A grid containing a column with a mark on layer n+1 and no mark on layer n is ill- formed. Phonological rules are blocked when they would create such a configuration"*(Hayes,1995, p.34).

b-Faithfulness Condition

Faithfulness condition is a rule that defines the relation between grid structure and bracketing structure. Hayes (1995) follows Hammond's (1984) and Halle and Vergnaud's (1984)postulation that there is a one- to- one correspondence between grid structures and bracketing structures; that is, every domain contains a single grid mark, and every grid mark is included within a single domain (p.41). This rule is termed as the Faithfulness Condition and is formulated as follows: "*Grid Marks must be in one-to –one correspondence with the domains that contain them"*.

c-Extrametricality

Extrametricality is considered as a fundamental concept in metrical phonology since its introduction by Liberman and Prince (1977, p.297) which they refer to by treating final syllables as "underlyingly non-syllabic" or extrametrical. Hayes (1995) defines extrametricality as a rule which "designates a particular prosodic constituent as invisible for purposes of rule application: the rules analyze the form as if the extrametrical entity were not there" (p.57). Furthermore, according to Hayes (1995, p. 58), there are two domains for extrametrical elements: segmental extrametricality i.e. consonants extrametricality, and higher level extrametricality in which syllables, feet, and words can be rendered extrametrical. The extrametrical element is usually put between angle brackets < >.

d-Priority Clause Principle

Hayes(1995) puts a restriction on the construction of degenerate feet. Degenerate feet are those "single light syllables in systems that respect syllable weight, and single

syllables in the quantity insensitive systems. These are the smallest logically possible feet in these systems" (Hayes, 1995, p.86).

These kinds of feet are severely avoided in Hayes's (1995) theory. Hayes (1995) proposes that languages put a strong ban on creating such kinds of feet, but the ban is relaxed only in case the degenerate foot is needed to avoid violating the CoCoCo (p.87). As a result, Hayes formulated a rule for prohibiting degenerate feet that includes strong and weak prohibitions. This rule according to Hayes (1995, p.87), reads as follows:

Foot parsing might produce degenerate feet under the following conditions:

- ***Strong prohibition*** *absolutely disallowed.*
- ***Weak prohibition*** *allowed only in strong position, i.e. when dominated by another grid mark .*

In the case of languages that put a strong prohibition on constructing degenerate feet, Hayes (1995, p.95) proposes the Priority Clause Principle to prevent this kind of feet appearing at the beginning and in the middle of parsing. Stray syllables at the end of parsing can be dealt with by extrametricality. Priority Clause Principle is phrased by Hayes (1995, p.95) as follows: *"If at any stage in foot parsing the portion of the string being scanned would yield a degenerate foot , the parse scans further along the string to construct a proper foot where possible".*

e-End Rule

The End Rule or ER for short, is a rule that assigns prominence within the grid at word layer as well as at phrase layer and sentence layer. It was first proposed by Prince(1983, p.25) who speculates that since little information is carried over from the tree to the grid, it is better to follow a direct route to the match –up by dealing with terminals only, i.e. instead of assigning prominence to every node, it is better to assign it only to terminals.

6- Phrasal Stress Rules

Phrasal stress assignment in metrical theory shows some difference from word stress assignment. Hayes (1995, p.367) explains that after assigning stress to all syllables up to the word layer, phrasal stage of deriving metrical structure starts to work. Hayes (1995) bases his metrical theory of phrasal stress assignment on a number of rules in addition to the two principles discussed earlier, i.e. the CoCoCo and the Faithfulness Condition. The metrical phrasal rules are as follows: the ER , Move X, and Beat Addition (henceforth BA). He assumes that these rules work together to reach a particular rhythmic target. Basically, they tend to form output configurations which space stresses neither too closely nor too far apart. Then, if a grid possesses such a property, it can be said to be eurhythmic. However, being close or far from achieving eurhythmy entails that there are degrees of eurhythmy stretching along a continuum from highly eurhythmic to highly dysrhythmic (Hayes, 1995,p.372).

a) The End Rule

As discussed earlier, the ER is a word as well as a phrasal rule that has the function of assigning final prominence to the grid it is applied to. At the phrasal level, Hayes (1995, p. 368) points out, the ER takes the responsibility of maintaining relative

prominence relations between the constituents of the phrase. Moreover, other than the ER, all phrasal rules are optional, their application is based on the degree of the improvement they can provide in enhancing the eurhythmy of the string (Hayes,1995,p.373).

b) Move X

Following Prince's (1983) terminology of Move X, Hayes (1995, p.370) sets the general schema of this rule as follows: "Move one grid mark at a time along its row. Where Move X resolves a stress clash, movement must take place along the row where the clash occurs". The grid below shows how Move X works in bracketed grid theory:

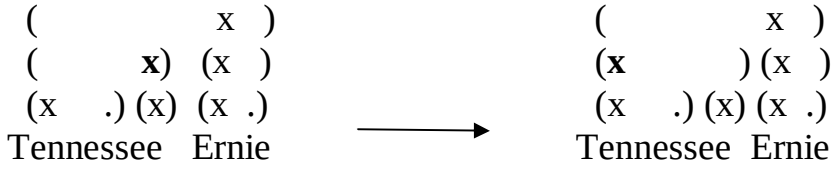


Figure (6): The Application of Move X to the English Phrase "Tennessee Ernie" Adopted from Hayes (1995,p.370)

More importantly, Move X is restricted by three constraints. First, since Move X must agree with the CoCoCo, then, the moved element should be assigned the strongest available stress, otherwise it violates the CoCoCo by creating a gap in the grid. The second constraint is a universal constraint that entails moving the weaker stresses from the stronger ones not the other way round. The last constraint on Move X is its directionality which is language specific. For example, in English, move X moves weaker stresses only leftwards, whereas German is bidirectional, i.e. stress can move in both directions (Hayes, 1995, p. 370).

C. Beat Addition (BA)

The BA rule plays a very important role in the bracketed grid theory. Hayes (1995, p.371) describes it as "a rule that has the effect of increasing the degree of rhythmic alternation in a phrase by increasing the level of stress on particular syllables". To explain, when two constituents are sisters, there exists a domain to assign them a prominence relation by applying the ER. The problem arises when the two successive constituents are not sisters, i.e. one dominates the other. This indicates the lack of a domain to apply the ER. The example in figure (7) shows that *Farrah* and *Majors* do not have equal stresses to let the ER be applied to assign them a prominence relation. This calls for using the BA rule by putting additional grid marks to get the appropriate rhythmic alternation for the phrase below (Hayes, 1995, p.373).

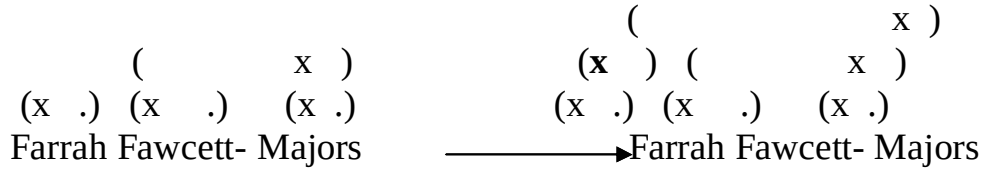


Figure (7): Beat Addition in "Farrah Fawcett- Majors"

Adopted from Hayes (1995,p.371)

7. Two Examples of Phrasal Rule Application

As stated before, the only obligatory rule at phrasal level is the ER, other rules are auxiliary in the sense that they are applied to make the text eurhythmic or more eurhythmic. Their other role is to prepare the ground for the ER to apply appropriately. Hayes (1995 ,p.376) states that when the heights of the taller grid columns in a bracketed grid are the same, it is easy to show the relative prominence between them by assigning the ER (right /left). Nevertheless, the case of difficulty appears when the highest grid column internally has more or less grid marks before the application of the ER .These two cases are called: making the shorter taller, and making the taller taller which are discussed in turn below.

(a) Making the Shorter Taller

In the figure (8a), the application of the ER to the word "fell" which is the most prominent word in the phrase faces a problem; ER violates the CoCoCo on the column above "fell" when applied, as shown in (8b). The solution to the problem, as Hayes proposes, is to adopt Halle and Vergnaud's (1987) "Stress Equalization Convention" (SEC for short) modified by Hayes (1995,p.378) as: "when two metrical constituents are concatenated, and their tallest grid columns are unequal, the grid marks are assigned to the shorter column if necessary to avoid violating the Continuous Column Constraint". Adding grid marks to the shorter columns as stated in the rule above refers to what Hayes calls Domain Generation (DG). (8c) shows how DG is applied to the grid of "Mighty oaks fell".

a

```
(          x )
(x    .)  (x )   (x)
Mighty  oaks +  fell        (inputs)
```

b

```
(          x)  (x)          (Domain Generation invoked by Stress
(x   .)  (x)   (x)                Equalization Convention )
Mighty  oaks   fell
```

c

```
(              x)          ER/ right
(          x)  (x)
(x   .)  (x)   (x)
Mighty oaks fell
```

(b)

Figure (8): Domain Generation in "making the shorter taller" Case Adopted from Hayes (1995 ,p.379)

(b) Making the Taller Taller

One of the examples that Hayes (1995) gives for this case is the sentence "John saw Mary". In this sentence, "Mary", the most prominent element in the grid, has a grid column that is higher than the other grid columns before applying the ER/right.

```
(    x   )
(x)  (x) (x  .)
```

John saw Mary

Figure (9): The Case of Making the Taller Taller
Adopted from Hayes (1995,p.379)

Hayes's suggestion is to amplify the stress on "John" by BA which he formulates as: "Apply Domain Generation [DG] pretonically within a domain (Hayes,1995,p.381). The example in figure (9) will be like the following by the application of BA:

(x)
(x) (x)
(x) (x) (x .)
John saw Mary

Figure (10): Beat Addition in "making the taller taller" Case
Adopted from Hayes (1995,p.381)

However, there are cases in which the application of BA runs into difficulties; this is when the bracketed grid has no slot available for BA to apply. Notice the example below from Hayes(1995,p.392):

(x)
(x)
(x)
(x) (x) (x) (. . x .)
John's three chunks of banana

Figure (11): The Inapplicability of BA Application to the Word "chunks" Adopted from Hayes(1995, p.392)

In this case it is not possible to add a grid mark to "chunks" without violating the Faithfulness Condition. Therefore, assuming that "absolute heights of grid columns are phonetically irrelevant", Hayes's solution to this problem is that there is no harm in adding a "vacuous" grid mark when there is no change in the relative column heights is enhanced(Hayes, 1995, p.393).This is what Hayes(Hayes, 1995, p.393) calls Grid Expansion (henceforth GE) giving it the following formulation:

Grid Expansion

a- Insert an empty grid layer .

b- Resolve any CoCoCo violation that would result by applying the DG rule.

GE, as Hayes (1995), assumes, creates new locations where BA can be applied. As with other phrasal rules, it is an optional rule that helps in achieving eurhythmy in the text. In the example given in figure (11), the new inserted layer is the second, and the DG rule is applied to "banana" to avoid the violation of the CoCoCo. Afterwards, BA is added twice to "John's" and once to "chunks" .This completes the derivation as shown in figure (12)

(x)
(x)

(x) (x)
(x) **(x)** **(x)**
(x) (x) (x) (. . x .)
John's three chunks of banana

Figure (12): The Application of the Grid Expansion Rule
Adopted from Hayes(1995,p.393)

In short, phrasal stress assignment depends mainly on morphological and syntactic groupings, i.e. whether the most prominent constituent in the phrase is the rightward element (in phrases), or the leftward constituent (in compounds).

8- The Syllable Structure of CA

It is widely accepted that the syllable plays a very important role in the placement of stress in words. As defined by Crystal (2003, p.447), a syllable is "a unit of pronunciation typically larger than a single sound and smaller than a word". Therefore, in order to study Arabic word stress, it is important to be familiar with the types and the nature of syllables in Arabic.

According to Al-Ani(1983, p.133), Bishr(2000, p.510), Omar(2006, p.307) and Anees(2007, p.150-153), Arabic has five types of syllables and they are as follows:

1- Light syllable (cv) as in /kæ tæ bæ[4]/"he wrote".
2- Heavy closed syllable (cvc) as in /qʊl/ "say (imperative)".
3- Heavy open syllable (cv:) as in /la:/ "no".
4- Superheavyclosed syllable (cv:c) as in /na:r/ "fire".
5- Superheavy closed syllable (cvcc) as in /bæħr/ "sea" .

Al-Ani(1983, p.133) and Bishr(2000, p.510) added another superheavy closed syllable of the type (cv:cc) as in the words /mæ ha:mm/ "tasks" and /ra:dd/ "returned back".

9- CA Word Stress and Phrasal Stress

At the word layer**,** stress is assigned to the most prominent syllable in a word. The present study adopts the stress rules of CA stated by McCarthy (1979, p.461). According to him, one of the properties of CA is that stress can retract an infinite number of syllables from the right boundary of a word, as opposed to some Arabic dialects in which stress can retract maximally three or four syllables. Theoretically speaking, the foot in CA can be of an infinite size (when all syllables before the last are light). Below, are the CA stress rules adopted from McCarthy(1979,p.460):

- Stress a final superheavy syllable. e.g. /kæ ˈri:m/ "generous"
- Otherwise, stress the rightmost non-final heavy syllable. e.g. /sˁɪ ˈra: tˁæn/ "a way"
- Otherwise stress the first syllable. e.g. /ˈkæ bæ ru:/ "they grew old"

For sentence stress, Al-Absi(2011,p.36) defines it as the relative pressure on a word of a sentence to make it the most prominent element of that sentence. This happens when there is an emphasis on a particular word or a focus on something extraordinary or there is a need to show surprise. Regarding the rhythmic nature of Arabic sentences, Hassan (2004, p.307) asserts that unlike words, the stress in Arabic

[4] The researchers follow Roach(2000) for transcribing Arabic vowels and the IPA system for transcribing Arabic consonants.

sentences can show rhythm clearly. This rhythmicity is created by keeping equal distances between stressed syllables within one sentence. The equal distance generates the musicality of Arabic sentences.

Concerning sentence stress assignment in Arabic, in ordinary speech without the need to focus on a certain word of a sentence, stress goes to the rightmost element of the sentence, i.e. its final lexical word, while other words take secondary stresses (Al-Khuli(1987) cited in Al-Absi(2011,p110)). On the other hand, the unmarked stress rule of the Arabic compound construction (construct state)[5] /ʔɪdˤɑ:fæ/, is to put stress on the first element.

e.g. /ˈmæʕ hæ dʊt- tæm θi:l/ *"Acting institute "*

/ˈnɑ: dɪt -tæħ ri:r/ *"liberation club"*

The compound construction stress rule is not applicable when the second element of a compound has a special importance, in this case this second element carries stress (Bishr, 2000, p.521). For example when the verse –final word in a Qur'anic verse constitutes the second element of the compound construction or the construct state, it should be the one that carries the primary stress due to its importance in retaining the rhythmicity of the Qur'anic verses.

10- Metrical Parameters of CA

According to the characteristics of CA, the metrical parameters are set and illustrated below.

a-Size(Boundedness)

As CA stress belongs to the unbounded stress systems, accordingly, the foot constructed in CA is called unbounded foot (Hayes,1980,p.111). Ali and Abd.Ghani (2014,p.41)describe an unbounded foot as a foot that is built over two or more syllables or moras, one of which is strong and the other(s) is weak.

Hayes(1995,p.296), following McCarthy(1979), and Baković(2004,p.203) classifies CA stress as belonging to the Default-to-Opposite side unbounded system; with the rightmost heavy syllable taking the primary stress, otherwise the leftmost syllable takes the stress.

Nevertheless, there is a third foot type which is called a degenerate foot, see section 5. Point d). Some languages allow constructing degenerate feet, others strongly prohibit them. CA, like Arabic dialects, strongly prohibits constructing degenerate feet.

b-Quantity Sensitivity

According to McCarthy(1979), CA is sensitive to the weight distinction between heavy and light syllables. CA, like other Arabic dialects, is characterized by having two degrees of syllable heaviness: heavy and superheavy.

c- Dominance, Direction of Parsing, and Iterativity

CA foot is left dominant, i.e. the leftmost syllable represents the foot head. The direction of foot parsing is leftward (foot parsing begins from right to left)

[5] Construct state is defined as "two nominal expressions grouped together as a constituent". The first expression is the construct head or the possessor, called in Arabic /ʔælmʊdˤɑ:f/. The second expression /ʔælmʊdˤɑ:fʊ ʔɪleɪhɪ/ is a noun phrase "which can itself be a construct state"(Hoyt,2007,p.433).

(McCarthy,1979,p.461; Hayes,1980,p.130).

Regarding iterativity, CA foot building is non-iterative; however, Kager(1995,p.373) assumes that having non-iterative foot at one edge and an iterative foot at the opposite edge results in bidirectional systems. Hence, although CA foot is non-iterative when only one foot is constructed in a word with light syllables, it is iterative when the word has more than one heavy syllable.

d- Extrametricality and End Rule

As defined earlier, extrametricality rule renders a particular prosodic constituent as invisible in the process of metrical rule application (Hayes,1995, p.57). For CA, following Hayes(1980) and J. McCarthy (personal communication, March 20, 2016), all final consonants are extrametrical in the process of foot parsing, hence, final /cvc/ is structurally a light syllable /cv/ after applying consonant extrametricality, and final superheavy syllables /cv:c/ and /cvcc/ become /cv:/ and /cvc/ when their final consonants are rendered extrametrical.

Moreover, the present study assumes an optional syllable extrametricality in CA for words ending in the heavy syllable /cv:/ to avoid receiving stress by this syllable when the ER/right is applied. Finally, in CA, the ER /right version is applied to the word layer. The preceding rules and parameters for CA words can be summarized in the following points:

- **Foot Construction**: form left-headed, quantity sensitive unbounded feet from left to right. Hayes(1995) shows the unbounded foot construction of a language like CA (see figure 5).
- **Syllable extrametricality** (optional).
- **Consonant extrametricality**.
- **Word layer construction** : End Rule/right.
- **Degenerate feet are strongly prohibited**.

11- Phonological Processes Involved in Qur'anic Recitation[6]

Al-Khuli(1987) (cited in Al-Aabsi(2011,p110)) states that in sentence stress assignment, words may abandon their main stress positions when they are in isolation. This is because of some phonological processes that affect the syllabification of words when put adjacent to other words in a chain of speech and ultimately this will affect the placement of stress in these words. These phonological processes are illustrated below:

a- Short vowel lengthening (ʔælʔɪʃbɑːʕʊl mæqtˤæʕiː)

Short vowel lengthening /ʔælʔɪʃbɑːʕʊl mæqtˤæʕiː/ means lengthening the final short vowel of a verse-final word. Every short vowel in Arabic has a corresponding long vowel, this short vowel is lengthened to its corresponding long vowel in the process of /ʔælʔɪʃbɑːʕʊl mæqtˤæʕi: (Al-Mayyahi:, 2014, p.158). e.g.

(ʔæl-ʔæħzɑːb 10) L e d c b a ` _ ^] \ …M 8 7

"…,and when the eyes grew wild and the hearts reached to the throats , and you were harbouring doubts about Allah "

Originally, the verse-final word is written as /ʔæðˤðˤʊnuːnæ/ "*the doubts*", but

[6] Qur'anic recitation is the reading aloud of the Holy verses.

under the effect of short vowel lengthening process, it becomes /ʔæðˤ ðˤʊ nu: nɑ:/.

b- Long vowel shortening (ʔæl ʔɪxtɪlɑ:sʊl mæqtˤæʕi:)

Al-Mayyahi(2014,p.161) defines long vowel shortening /ʔæl ʔɪxtɪlɑ:sʊl mæqtˤæʕi:/ as the process of shortening the long vowel in pauses and in the middle of speech.

e.g. (ʔæʃ-ʃʊʕærɑ:ʔ 78) L ¼ » º ¹ ¸ M 8 7

"*who has created me, and it is He who guides me"*

The underlined verse-final word /jæhdi:nɪ/ "*guides me*" originally was /jæhdi:ni:/ but when long vowel shortening is applied to this word, the final /i:/ is changed into /ɪ/.

c-Syllable Blending (ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:)

Al-Absi(2011,p.245-246) refers to syllable blending or /ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:/ as the phonological change that happens to the syllables of adjacent words (the final syllable of one word and the initial syllable of the following word). Al-Absi gives an example phrase / sɑ:ʕi:- ʔælbæri:d / "*postman*" which becomes /sɑ:ʕɪl- bæri:d/ after syllable blending. He clarifies that within context, the glottal stop and the short vowel /æ/ of /ʔæl bæ ri:d/ are elided and the remaining /l/ is blended with the preceding syllable /ʕi:/ after the long vowel of /ʕi:/ is shortened under the effect of long vowel shortening. In this way, the two words are syllabified together in the following way: /sɑ:ʕɪl- bæri:d/

d-Elongation (mædd)

Elongation which is called /mædd/ in Arabic, means the lengthening of a vowel in Qur'anic recitation. The minimum elongation measure is about articulating one long vowel and the maximum is about three long vowels. The minimum measure indicates that either the long vowel has its ordinary length or the short vowel is lengthened to its corresponding long vowel, whereas, the maximum length refers to prolonging the long vowel twice and thrice its ordinary length.

In Qur'anic recitation, Al-Ibadi(2011,p.51)and Hawwas (2011,p.19) classify elongation into two basic types. They are the following:

1- The normal or intrinsic elongation (ʔælmæddʊl ʔæsˤli:)

2- The incidental elongation (ʔælmæddʊl færʕi:)

Al-Ibadi (2011,p.51)describes the first elongation as the normal lengthening of long vowels. Similarly, Saleh (2011, p.135) defines the intrinsic elongation as "the normal elongation of a long vowel, it is considered equivalent to two short vowels". The second type of elongation; however, happens when the long vowel precedes the glottal stop /ʔ/ or a syllable final consonant. In case long vowels come before the glottal stop /ʔ/, three types of elongation may result(Hawwas,2011.p.19):

1-**The Connected elongation (ʔælmæddʊl mʊttæsˤɪl).** In this type of elongation, as Saleh (2011, p.138) states, the long vowel is extra elongated when it precedes a glottal stop in the same word. In this case, the long vowel is lengthened twice or thrice the time it is normally articulated.

e.g. /dʒɑ:ʔ/ *"he came"*

2- **The Separated elongation (ʔælmæddʊl mʊnfæsˤɪl).** It occurs when a word ends in a long vowel followed by a word which begins with a glottal stop. The long

vowel in this type of elongation is lengthened twice or thrice its normal duration of articulation (Saleh, 2011, p.137).

e.g. /bɪ m**ɑ:-** ʔʊn zɪl/ *" with that which has been sent*"

3- **The Substituted elongation (mæddʊl bædæl):** This type of elongation occurs as a result of substituting the short vowel and the following consonant of a heavy closed syllable by the long vowel that corresponds to that short vowel. It happens under the condition that the onset and the coda consonants of the (cvc) syllable are both a glottal stop.

e.g. /ʔ**æʔ** mæn nɑ:/ becomes /ʔ**ɑ:** mæn nɑ:/ "*we believe*"

Moreover, Al-Ibadi (2011,p.53) states that when long vowels precede a syllable final consonant, this will result in two types of elongation. They are:

1-Obligatory or required elongation (ʔælmæddʊl lɑ:zɪm): it mostly occurs when long vowels are followed by geminated consonants(the first consonant ends the syllable that contains the long vowel and an identical consonant begins the following syllable). By this type of elongation, long vowels are lengthened thrice the duration they are normally pronounced with.

e.g. /ʔædˤ dˤ**ɑ:**l li:n/ "*those who went astray*"

/d**ɑ:**b bæ/ "*a moving creature*"

Obligatory elongation also occurs when the long vowel comes before a syllable-final consonant which is not geminated as in :

/ʔ**ɑ:**l ʔɑ: næ/ *"Now (you believe!)"*

2-Elongation occasioned by finality (ʔælmæddʊl ʕɑ:rɪdˤ lɪssɪku:n): this type of elongation occurs when the Qura'nic reciter chooses to stop at a particular word or at the verse-final word. e.g.

(ʔæl mʊʔmɪnu:n4) L 5 4 3 2 1 M 8 7

"*and those who pay the zakat*"

The underlined word in continuous recitation is /fɑ: ʕɪ lu: næ/ (cv:- cv- **cv:- cv)** (the final consonant is followed by a vowel, hence the /u:/ is not extra elongated). In pausing, it becomes / fɑ: ʕɪ lu: n/ cv:- cv-**cv:c** (here the /u:/ is extra elongated as the /n/ is not vocalised)

e-The Phonological Rules of Articulating Syllable- Final /n/ and Nunation in the Holy Qur'an

The syllable –final /n/ is defined by Hawwas (2011, p.4) as a /n/ sound (written and pronounced) that occurs in syllable final position, word medially or finally in nouns and verbs, but only finally in particles (ħʊru:f). Nunation which is an indication of indefiniteness for Arabic nouns, is defined as an additional /n/ (only pronounced) that is attached to the end of nouns and written orthographically as three diacritics corresponding to the three short vowels: (ً) corresponds to /æ/, (ٌ) corresponds to /ʊ/, and (ٍ) corresponds to /ɪ/. These diacritics are pronounced as /n/ preceded by the short vowels /æ/,/ʊ/, and /ɪ/(Hawwas, 2011,p.4). However, both types of final /n/ are submitted to the following four phonological rules in Qur'anic recitation.

1- Assimilation (ʔɪdɣɑ:m)

There are two types of assimilation related to pronouncing the syllable-final /n/:

assimilation with nasality kept (ʔɪdɣɑ:m bɪɣʊnn**æ**) and assimilation with nasality lost (ʔɪdɣɑ:m bɪlɑ: ɣʊnn**æ**). Kadarisman (2001) maintains that assimilation with nasality kept takes place when /n/ is followed by /j,n,m/and /w/ sounds. He describes it as an assimilation of place that can be found between two words but not word internally. In this process the /n/ is assimilated to the following consonant (p.12).

e.g. /mɪ**n**/+/ **j**əʊm/ "*on a day...*" becomes /mɪ**j- j**əʊm/

The second type of assimilation which is assimilation with nasality lost(ʔɪdɣɑ:m bɪlɑ: ɣʊnnæ) takes place when the syllable final /n/ comes before a syllable beginning with /r/ or /l/.

e.g. /hʊ dæ**n**/+/**l**ɪl mʊt t**æ** qi:n/ "*a guidance to pious believers of Allah*" becomes / hʊ d**æl- l**ɪl mʊt t**æ** qi:n /

2- Inversion or Labialization (ʔɪqlɑ:b)

Inversion or labialization is described by Kadarisman (2001) as a kind of regressive assimilation that happens when syllable-final /n/ is followed by a /b/ sound. In this process, the bilabial feature of /b/ spreads backward to the alveolar /n/ inverting it into the bilabial /m/(p.9).

e.g. /ʔæ**n b**æt nɑ:/ "*We have produced (therein every kind of…plants)* "

becomes /ʔæ**m b**æt nɑ:/

3- Concealing (ʔɪxfɑ:ʔ)

Gouda(1989) describes concealing as a process in which the syllable final /n/ is articulated in a way between assimilation and clear reading "…, where the tongue does not quite touch the alveolar ridge, and the vocal cavity holding the shape of the preceding vowel and the total sound articulated through the nasal cavity" (cited in Quotah, 1994, p.22).

Quotah (1994, p.21) considers the process of concealing as partial assimilation with extra-nasalization. It happens when the syllable final /n/ is followed by the following fifteen sounds: sˤ,ð, θ,k, dʒ, ʃ,q,s,d, tˤ,z,f,t, dˤ, and ðˤ. The /n/ assimilates to these sounds in place of articulation, with this nasal consonant articulated partially with extra-nasalization.

4- Clear Reading (ʔɪ ðˤhɑ:r)

The syllable final /n/ is clearly read before the following six consonants : /ʔ, x, h, ʕ, ħ, and ɣ/ (Al-Ibadi,2011, p28).

e.g. /wæ mæ**n - ʔ**æʕ ræ dˤæ/ "*and who withdrew*"

f- Rules of Articulating the /l/ sound (lɑ:mʊt tæʕri:f) in the Definite Article (ʔæl -)

/lɑ:mʊt tæʕri:f/ is a /l/ sound that is part of the definite article (ʔæl-) which is used to define indefinite Arabic nouns. For example, /kɪtɑ:b/ means "*a book*" whereas, /ʔæl kɪtɑ:b/ means "*the book*". There are two basic rules for pronouncing the /l/ of the definite article mentioned by Hawwas(2011,p.30), Al-Ibadi(2011,p.44),and Kadarisman(2001,p.18) and stated below.

1- **Clear Reading** (ʔælʔɪdˤhɑ:rʊl qæmæri:): the /l/ is clearly read when followed by a noun beginning with one of the fourteen sounds that are called lunar sounds (ʔælħʊru:fʊl qæmærɪjæ). The lunar sounds are: ħ, ʔ, b, ɣ, k, w, x, f, q, j, m, h, dʒ, and ʕ.

e.g. /ʔæl qæ mær/ "*the moon*"
/ʔæl ʔɪn sɑ:n/ "*the Man*"

2- **Assimilation** (ʔælʔɪdɣɑ:mʊʃ ʃæmsi:)

/lɑ:mʊt tæʕri:f/ is assimilated to the following sound when the /l/ is followed by nouns beginning with one of the fourteen sounds which are called solar sounds (ʔælħʊru:fʊʃ ʃæmsɪjæ). The solar sounds are: tˤ, θ, sˤ, r, t, dˤ, ð, n, d, s, ðˤ, z, ʃ, and l.

e.g. /ʔæʃ ʃæms/ "*the sun*"
/ʔæd di:n/ "*the religion*"

12-Prosodic Hierarchy

Phrasal phonology is the study of the rules that can be applied across word boundaries. One of the theories of phrasal phonology is the prosodic hierarchy theory developed by Selkirk (1978,1980,1981) and extended by Nespor and Vogel (1982,1983). Hayes(1989, p.201) states that the core idea of this theory is that "utterances are phrased, in the same sense that musical passages are phrased". This phrasing, similar to music, is hierarchical, beginning from the smallest units then small phrases and ends in larger phrases.

The prosodic structure representation consists of a hierarchical representation of prosodic constituents and a prominence representation, i.e. the head of each constituent. According to the prosodic structure hypothesis, the constituents of the prosodic hierarchy that have direct reference to sentence phonology are: the prosodic word, the minor and major phonological phrases, the intonational phrase and the utterance. These constituents are assumed to be universally present. Therefore, following (Selkirk(1978,1980), Nespor and Vogel(1983) cited in Selkirk(1986,p.383), the sentence phonological representation is composed of a hierarchy of prosodic categories or constituents which function as domains for phonological rules. Nevertheless, Selkirk (2005,p.26) demonstrates that prosodic categories at and above the word layer are necessarily grounded in the syntax.

A number of proposals have been made about the exact number of layers of prosodic constituents which are part of the prosodic hierarchy. One of these proposals is that of Selkirk (2005) which is adopted by Hellmuth (2006) for Egyptian Arabic. Selkirk (2005) proposes an eight- layer prosodic hierarchy shown in the table below.

Table (1): Selkirk's (2005) Prosodic Hierarchy
Adopted from Hellmuth (2006,p.26)

Constituent	Abbreviation	Equates to:	Maps from:
Utterance	U		
Intonational Phrase	IP		A root sentence or sentence external clause
Major Phonological Phrase	MaP	Phonological Phrase/Intermediate Phrase	A Maximal Projection (XP)
Minor Phonological Phrase	MiP	Accentual Phrase	A syntactically branching constituent(two PWds)
Prosodic Word	PWd	Phonological Word	A morphosyntactic word (lexical)
Foot	Ft		
Syllable	σ		
Mora	μ		

13-Data Analysis

This section deals with the analysis of word stress and sentence stress of the Qur'anic language according to Hayes's (1995) framework of metrical theory by using the bracketed grid model. As the Qur'anic language is that of CA, the parameters set for CA can work to build metrical feet on the Qur'anic words of the two examined chapters /ʔæl fælæq/ "*the daybreak*" and /ʔæn na:s/ "*the mankind*" which are known as the verses of refuge (ʔælmʊʕəʊwɪðæteɪn).

In this study, the Qur'anic words are transcribed and syllabified according to the Qur'anic recitation of Al-Minshawi, a well-known Egyptian Qur'anic reciter. The process of building metrical feet over these words is preceded by assigning them primary stress according to McCarthy's (1979) CA word stress mentioned in section 9. Afterwards, the Qur'anic verses are assigned phrasal stress after establishing their prosodic hierarchical structure followed by showing their rhythmic structure by the use of Hayes's bracketed grid with the aid of phrasal stress rules to make these grids eurhythmic or more eurhythmic.

The data used in this study includes (32) words, (12) verses, and (1) sentence. The two Qur'anic chapters consist of (11) verses; while, the twelfth verse and the one sentence are usually recited before each Qur'anic chapter, thus are counted in the analysis of the two chapters.

After transcribing the (32) Qur'anic words, they are classified into four categories according to the number of their syllables, they are: monosyllabic, disyllabic, trisyllabic, and tetrasyllabic as illustrated below:

Monosyllabic words are only (3) with the following syllable patterns: (cv:), (cvc), and (cv:c). the metrical analysis of one example of each syllable pattern is given below:

(cv:) ------ mɑ: "what (relative pronoun)" (stress goes on this sole syllable)
(x) ER/right
(x)
mɑ:

(cvc)----- qʊl "say (imperative)" (stress goes on this sole syllable)
(x) ER/right
(x)
qʊl

It is important to notice that consonant extrametricality cannot be applied to /qʊl/ as it would leave the word with a light syllable that can be made a degenerate foot which is strongly forbidden in CA.

(cv:c) -------- nɑ:s "people"(stress is assigned to this superheavy syllable)

(x) ER/right
(x)
nɑ:<s>

For the word /nɑ:s/, metrical foot construction rules render the final consonant extrametrical and build a foot over the remaining heavy syllable.

Disyllabic words in the analysed data are (16) with the following syllable

patterns: (cv cv:c), (cvc cvc), (cv: cvc), (cv cvc), (cvc cv), (cvc cv:c), (cv cv:). These syllable patterns are exemplified, assigned stress and analysed metrically below:

(cv cv:c)--------- ræ dʒi:m "the cursed" (stress is assigned to the final superheavy syllable)

(x) ER/right
(x)
rædʒi:<m>

Metrical foot construction rules render the final consonant extrametrical and build a foot over the final heavy syllable. The initial light syllable is left unfooted by Priority Clause Principle as it might form a degenerate foot which is prohibited in CA.

(cvc cvc)---------- bıs mıl[7] "in the name" (stress goes on the initial heavy syllable)

(x) ER/right
(x .)
bısmı<l>

(cv: cvc)-------- lɑ: hır "Allah" (stress is assigned to the initial syllable)

(x) ER/right
(x .)
lɑ: hı<r>

For both /bısmıl/ and / lɑ: hır/, the final consonant is made extrametrical and a metrical foot is constructed over the initial syllable and the following light one.

(cv cvc)--------- wæ qæb "the night as comes with its darkness" (stress goes to the initial light syllable)

(x) ER/right
(x .)
wæqæ<b>

The final consonant is rendered extrametrical and a foot is constructed over the two light syllables with the leftmost syllable being the prominent one.

(cvc cv)---------- ʃær rı "the evil" (stress is assigned to the initial heavy syllable)

(x) ER/right
(x .)
ʃærrı

(cvc cv:c)---------- xæn nɑ:s "the whisperer who withdraws after whispering" **(**stress is assigned to the final superheavy syllable**)**

(x) ER/right
(x) (x)
xæn nɑ:<s>

In the word above, the final consonant is rendered extrametrical and two feet are constructed over the two heavy syllables. ER/right gives the prominence to the rightmost foot.

(cv cv:)---------- ʔı ðɑ: "when (time adverbial)" (stress is put on the final heavy

[7] The words are syllabified according to how they are pronounced in Qur'anic recitation. They are analysed syntactically and phonologically with their syllabified forms. In addition, for clarity, the transcribed words are shown in the form of a group of syllables, e.g. instead of /bısmıl/, the word is written as /bıs mıl/.

syllable)
(x) ER/right
(x)
ʔɪ ðɑ:

/ʔɪ ðɑ:/ consists of a light syllable and a heavy one, as the final heavy syllable is of the open heavy type, it takes the stress. The initial light syllable is left unfooted by Priority Clause Principle and a foot is built over the final syllable.

Trisyllabic words are (11) with the following syllable patterns: (cv cv: cv), (cvc cv: cv), (cv: cv: cvc), (cvc cv: cvc), (cv: cv cvc), (cv cv cvc), (cvc cv: cvc), (cvc cv cv:), and (cv cv: cvc). These syllable patterns are exemplified, assigned stress and analysed metrically below:

(cv cv: cv)---------- ʔæ ʕu: ðʊ "I seek refuge" (stress is assigned to the pre-final heavy syllable)
(x) ER/right
(x .)
ʔæ ʕu: ðʊ

In the word above, a metrical foot is built over the pre-final heavy syllable and the following light one. The initial light syllable is left unfooted by Priority Clause Principle.

(cvc cv: cv)---------- bɪl lɑ: hɪ "in Allah" (stress goes to the pre-final heavy syllable)
(x) ER/right
(x)(x .)
bɪl lɑ: hɪ

For the word /bɪl lɑ: hɪ/, two feet are constructed; the first foot is over the initial heavy syllable, the second foot is built over the pre-final heavy syllable and the following light one. ER/right assigns prominence to the rightmost foot.

(cv: cv: cvc)---------- ʃeɪ tˤɑ: nɪr "satan" (stress goes to the pre-final heavy syllable)
(x)
(x) (x .)
ʃeɪ tˤɑ: nɪ<r>

The same process which is applied for the previous syllable pattern is applied for this pattern except for the application of consonant extrametricality.

(cvc cv: cvc)---------- ræħmɑ:nɪr "the Most Gracious" (stress is assigned to the pre-final heavy syllable)
(x) ER/right
(x) (x .)
ræħ mɑ: nɪ<r>

(cv: cv cvc)---------- ɣɑ: sɪ qɪn "the darkening (night)"(stress goes to the initial heavy syllable)

(x) ER/right
(x . .)
ɣɑ: sɪ qɪ<n>

In the word above, the final consonant is rendered extrametrical and a metrical

foot is built over the initial heavy syllable and the following light syllables.

(cv cv cvc)---------- mæ lı kın "king" (stress is assigned to the initial syllable)

(x) ER/right

(x . .)

mæ lı kı<n>

This word has a similar syllable pattern to the preceding one except for the type of the initial syllable which is a light one in the present word. Nevertheless, the same process of foot construction is applied for the two words.

(cvc cv: cvc)---------- wæs wɑ: sıl "the whisperer" (stress goes to the pre-final heavy syllable)

(x) ER/right

(x) (x .)

wæs wɑ: sı<l>

The word /wæs wɑ: sıl/ is composed of three heavy syllables. Foot construction process renders the final consonant extrametrical and builds two feet over this word; the first foot is constructed over the initial heavy syllable, the second foot is built over the pre-final heavy syllable with the following light one. ER/right assigns prominence to the rightmost syllable.

(cvc cv cv:)---------- ʔæl læ ði: "which" (stress is put on the initial heavy syllable)

(x) ER/right

(x .)

ʔæl læ<ði:>

For the above word, the final heavy syllable is rendered extrametrical in order to prevent ER/ right from assigning it prominence. Then, a foot is constructed over the initial heavy syllable and the following light one.

(cv cv: cvc) ---------- sˢʊ du: rın "breasts" (stress is assigned to the pre-final heavy syllable)

(x) ER/right

(x .)

sˢʊdu:rı<n>

In the word /sˢʊ du: rın/, the final consonant is made extrametrical and the initial light syllable is left unfooted by Priority Clause Principle. Then, a foot is built over the pre-final heavy syllable and the following light one.

Finally, tetrasyllabic words are only two in the analysed Qur'anic chapters. They are of two different syllable patterns; (cvc cv: cv: cv) and (cv cvc cv cv). The two patterns are exemplified and analysed metrically below:

(cvc cv: cv: cv)---------- næf fɑ: θɑ: tı "those who practice witchcraft" (stress goes to the pre-final heavy syllable)

(x) ER/right

(x) (x)(x .)

næf fɑ: θɑ: tı

In the word above, three metrical feet are constructed; the first foot is built on the initial heavy syllable, the second foot is on the next heavy syllable, and the last foot is built on the final heavy syllable with the following light one. ER/right assigns prominence to the rightmost foot.

(cv cvc cv cv)---------- jʊ wæs wɪ sʊ "he whispers" (stress is assigned to the antepenultimate syllable)

(x) ER/right

(x . .)

jʊ wæs wɪ sʊ

For the word above, a metrical foot is constructed over the heavy antepenult and the subsequent light syllables. The initial light syllable is left unfooted by Priority Clause Principle.

For phrasal stress assignment and according to the (13) verses analysed metrically (1 sentence and 12 verses), some of these verses are found to be eurhythmic, others are eurhythmic but can be made more eurhythmic by the application of a phrasal stress rule, some others are made eurhythmic by using one or more phrasal stress rules. The table below shows the number of verses which are eurhythmic, more eurhythmic or eurhythmic by the application of some phrasal stress rules in the analysed Qur'anic chapters.

Table (2): The Rhythmic Patterns of the Analysed Verses

Grid status	Phrasal stress Rules Applied	Number of Grids
Eurhythmic	----------	2
More Eurhythmic	Move X	2
Eurhythmic	BA	3
Eurhythmic	DG	2
Eurhythmic	GE, DG, BA	2
Eurhythmic	DG, Move X	1
Eurhythmic	DG, BA, Move X	1

The purpose of this study is to show the rhythmicity of the Qur'anic verses via the application of Hayes's bracketed grid model. The analysed grids of the Qur'anic verses proved to be eurhythmic either by themselves or by the aid of one or more phrasal rules. The first type which is represented by the grids that are eurhythmic by themselves are (2) in the analysed data. These are represented by the third and the fifth verses of /ʔælfælæq/ chapter. As an example of how these grids are eurhythmic by themselves, below is the analysis of the third verse of /ʔælfælæq/ chapter.

L C B A @ ? > M

/wæ- mɪɲ- ʃær rɪ- ɣɑ: sɪ qɪn- ʔɪ ðɑ:- wæqæb/[8] *"and from the evil of the darkening(night)as it comes with its darkness; (or the moon as it sets or goes away),"*

The third verse of /ʔælfælæq/ chapter begins with the conjunction particle /wæ/ which indicates that the entire verse is coordinated with the preceding one /mɪɲ - ʃær

[8] The words are syllabified according to how they are pronounced in Qur'anic recitation. They are analysed syntactically and phonologically with their syllabified forms. In addition, for clarity, the transcribed words are shown in the form of a group of syllables, e.g. instead of /ʔæʕu:ðʊ/, the word is written as /ʔæ ʕu: ðʊ/.

rɪ – mɑ: - xæ læq/. According to Al-Darwish (1999, p.453), the syntactic analysis of the verse's words is as follows: /wæ/ is a conjunction particle, /mɪɲ/ is a preposition, /ʃær rɪ/ is a prepositional complement and the first member of the construct state which is /ʃær rɪ- ɣɑ: sɪ qɪn/, /ɣɑ: sɪ qɪn/ is the second member of the construct state, /ʔɪ ðɑ:/ is a time adverbial and has the function of the first member of the construct state /ʔɪ ðɑ:- wæqæb/, and /wæqæb/ is a verb in the past tense with an implicit subject understood as 'it' (night), the verb with its implicit subject have the function of the second member of the construct state.

Phrasal stress is assigned to the present verse after setting its prosodic constituents. Above the word layer, the first prosodic layer is occupied by the MiP constituent which is represented by the adverb and the following verb **/ʔɪ ðɑ:**[9]**- wæqæb**/(both function as a construct state), as well as by the construct state /wæ- mɪɲ - **ʃær rɪ- ɣɑ: sɪ qɪn**/. The entire verse /wæ - mɪɲ- **ʃær rɪ- ɣɑ: sɪ qɪn- ʔɪ ðɑ:- wæqæb**/ represents an MaP and IP constituents that occupy the next layer up. Accordingly, phrasal stress is assigned to the present verse by putting a grid mark over **/ʃær rɪ/** -the leftmost element in the construct state /wæ- mɪɲ - **ʃær rɪ- ɣɑ: sɪ qɪn**/. In contrast, within the same layer, a grid mark is put over the word **/wæqæb/** which is the rightmost element in the construct state **/ʔɪ ðɑ:- wæqæb**/. As this word is the verse- final word of the present verse, it should be made more prominent than the leftmost element, hence it is assigned stress. ER/right, then assigns prominence to the present verse by putting the upmost X on the verse- final word /**wæqæb**/. The grid below shows the phrasal stress assignment of the present verse.

```
MaP & IP    (                                    x   )
MiP               (x           )      (          x   )
PWd               (x  )  (x      )      (  x)     (x   )
Ft                (x  .)  (x  .  .)        (x)     (x  .)
            wæ  mɪɲ  ʃær rɪ  ɣɑ: sɪ qɪ<n>   ʔɪ ðɑ:   wæqæ<b>
```

Figure (13): The Eurhythmic Bracketed Grid of /wæ- mɪɲ- ʃær rɪ- ɣɑ: sɪ qɪn- ʔɪ ðɑ:- wæqæb/

The grid above is well- formed as it satisfies the CoCoCo and the Faithfulness Condition. It is also eurhythmic since it shows a prominence relation between its columns. In addition, it achieves the required four-syllable space distance between the most prominent column and the one which comes next in prominence, the matter that qualifies this grid as being a eurhythmic grid.

The second type of the anlaysed grids is that which is represented by eurhythmic grids, but these grids can be made more eurhythmic by the application of one phrasal stress rule, namely, the Move X rule. Two examples of this type are found in the analysed data which are the sentence (اعوذ بالله من الشيطان الرجيم), and the fifth verse of /ʔænnɑ:s/ chapter. An example analysed below is the sentence that Qur'anic reciters

[9] Lexical words which are assigned phrasal stress are written in bold as distinguished from function words.

begin their recitation with.

K J I H G

/ʔæ ʕu: ðʊ- bɪl lɑ: hɪ- mɪ næʃ -ʃeɪ tˤɑ: nɪr-ræ dʒi:m/ "*I seek refuge in Allah from the cursed Satan*"

This sentence is a verbal sentence that starts with the verb /ʔæ ʕu: ðʊ/ which is a verb in the present tense with an implicit subject understood as 'I'. /bɪl- lɑ: hɪ/ is a prepositional phrase that is composed of the preposition / bɪ/ syllabified as /bɪl/ and the prepositional complement /lɑ: hɪ/. This prepositional phrase is followed by another prepositional phrase which is /mɪ næʃ -ʃeɪ tˤɑ: nɪr/ that consists of the preposition /mɪ næ/ syllabified as / mɪ næʃ/ followed by the prepositional complement /ʃeɪ tˤɑ: nɪr/. / ræ dʒi:m/ is an adjective modifying the noun /ʃeɪ tˤɑ: nɪr/.

It is important to notice that /bɪl lɑ: hɪ/ is composed of the preposition /bɪ/ and the noun /ʔæl lɑ: hɪ/. Under the effect of syllable blending (ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:), the /bɪ/ is blended with the initial syllable of /ʔæl lɑ: hɪ/ after eliding the glottal stop and the following short vowel /æ/ of /ʔæl/ resulting in the two words pronounced as one word which is /bɪl lɑ: hɪ/.

Moreover, the last two words /ʃeɪ tˤɑ: nɪr-ræ dʒi:m / are written as /ʔæl ʃeɪ tˤɑ: nɪ-ʔæl ræ dʒi:m/ but pronounced and hence syllabified as /ʃeɪ tˤɑ: nɪr-ræ dʒi:m/. Two phonological processes cause this pronunciation and syllabification change which are assimilation of the type (ʔælʔɪdɣɑ:mʊʃ ʃæmsi:) and syllable blending(ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:). The first word /ʔæl ʃeɪ tˤɑ: nɪ / begins with the definite article /ʔæl-/ followed by the solar sound /ʃ/ which makes the voiced alveolar lateral /l/ of the definite article assimilates in voice and manner of articulation to the voiceless palate-alveolar fricative /ʃ/. The word, hence, is pronounced and syllabified as /ʔæʃ ʃeɪ tˤɑ: nɪ/. As /ʔæʃ ʃeɪ tˤɑ: nɪ/ is preceded by the preposition / mɪ næ/, syllable blending blends the final syllable /næ/ of /mɪ næ/ with the initial syllable of /ʔæʃ ʃeɪ tˤɑ: nɪ/ after eliding the glottal stop and the following short vowel /æ/ resulting in /mɪ næʃ -ʃeɪ tˤɑ: nɪ/.

The last word /ʔæl ræ dʒi:m/ begins with the definite article /ʔæl-/ followed by the solar sound /r/ which results in assimilating the lateral /l/ with the trill /r/ in manner of articulation causing the word to be pronounced as /ʔær ræ dʒi:m/. Finally, the adjacency between the two words /ʔæʃ ʃeɪ tˤɑ: nɪ/ and /ʔær ræ dʒi:m/ causes the final light syllable of /ʔæʃ ʃeɪ tˤɑ: nɪ/ which is /nɪ/ to be blended with the /r/ of the initial syllable of the word /ʔær ræ dʒi:m/ after eliding the glottal stop and the following short vowel making the two words pronounced and syllabified as /ʃeɪ tˤɑ: nɪr- ræ dʒi:m/.

Phrasal stress is assigned to this sentence after setting its prosodic constituents which are mapped from syntactic constituents. Therefore, the Mip constituent is represented by the verb and the prepositional phrase that follows it, i.e. /**ʔæ ʕu: ðʊ-bɪl lɑ: hɪ**/ and also by the prepositional phrase /mɪ næʃ **-ʃeɪ tˤɑ: nɪr-ræ dʒi:m**/. Above the word layer, phrasal stress is assigned to the rightmost element of the phrase (Al-Khuli(1987) cited in Al-Absi(2011,p110)). Accordingly, an X is added on /**bɪl lɑ: hɪ**/ and /**ræ dʒi:m**/.The next layer up which is occupied by the Map and the

IP constituents are represented by the entire verse /**ʔæ ʕu: ðʊ- bɪl lɑ: hɪ** - mɪ næʃ -**ʃeɪ tˁɑ: nɪr-ræ dʒi:m**/. ER/right adds the topmost grid mark on / **ræ dʒi:m**/.The following grid shows how phrasal stress is assigned to the present sentence by using Hayes's (1995) bracketed grid model:

```
IP          (                                              x)
MiP &MaP    (          x   )         (                     x)
PWd         (   x   )  (  x  )       (   x   )      (     x)
Ft             (x   .)  (x)(x  .)      (x) (x   .)       (x)
            ʔæ ʕu: ðʊ  bɪl lɑ: hɪ  mɪ næʃ ʃeɪ tˁɑ: nɪ<r>  ræ dʒi:<m>
```

Figure(14):The Bracketed Grid of /ʔæ ʕu: ðʊ- bɪl lɑ: hɪ- mɪ næʃ -ʃeɪ tˁɑ: nɪr-ræ dʒi:m / Before the Application of the Move X Rule

The grid above is well-formed as it satisfies the requirement of the CoCoCo and the Faithfulness Condition and it is eurhythmic as well because it shows a prominence relation between its columns in addition to an alternating stress pattern. However, to approach the four- space distance between the prominent columns stated by Hayes (1984), Move X is applied to move the grid mark of /lɑ:/ leftward to /ʕu: / to have a grid of three space distance instead of two, as shown in the following grid:

```
            (                                              x)
MiP &MaP    (   x ←———————  )        (                     x)
PWd         (   x   )  (  x  )       (   x   )      (     x)
Ft             (x   .)  (x)(x  .)      (x)(x   .)        (x)
            ʔæ ʕu: ðʊ  bɪl lɑ: hɪ  mɪ næʃ ʃeɪ tˁɑ: nɪ<r>  ræ dʒi:<m>
```

Figure(15):The Eurhythmic Bracketed Grid of /ʔæ ʕu: ðʊ- bɪl lɑ: hɪ- mɪ næʃ -ʃeɪ tˁɑ: nɪr-ræ dʒi:m / After the Application of the Move X Rule

The third grid types are those grids which are made eurhythmic by the application of the BA rule only. These are represented by (3) verses; the first and the second verses of /ʔælfælæq/ chapter, and the first verse of /ʔænnɑ:s/ chapter. An example of this case is the first verse of /ʔænnɑ:s/ chapter shown below.

LTSRQPM

/qʊl- ʔæ ʕu: ðʊ- bɪ- ræb bɪn- nɑ:s/ *"Say: ' I seek refuge with (Allah)the Lord of mankind,' "*

This is the first verse of /ʔæn nɑ:s/ chapter which is a direct speech. It begins with the word /qʊl/ '*say*' followed by a verbal sentence /ʔæ ʕu: ðʊ- bɪ- ræb bɪn- nɑ:s/. According to Ibn-Khalawayh (1985,p.238), /qʊl/ is analysed as an imperative verb with an implicit subject understood as 'you', /ʔæ ʕu: ðʊ/ is a verb in the present tense and its subject is implicit understood as 'I'. /bɪ- ræb bɪn / is a prepositional phrase that is composed of the preposition /bɪ/ and the prepositional complement /ræb bɪn/ which is considered also as the first member of the construct state /ræb bɪn- nɑ:s/. The last word /nɑ:s/ is analysed as the second member of the construct state.

It is important to realize that the word /nɑ:s/ which recurs as a verse-final word

in five verses of /ʔæn nɑ:s/ chapter is submitted to the phonological process of elongation (mædd) of the type elongation occasioned by finality (ʔælmæddʊl ʕɑ:rɪdˁ lɪssɪku:n). The word /nɑ:s/ in continuous reading is read as /nɑ: sɪ/, but in pausing when it occurs as a verse –final word, the short vowel of the final syllable is elided and its onset consonant /s/ is attached to the preceding heavy syllable making it a superheavy one. Consequently, this makes the vowel of the superheavy syllable pronounced twice or thrice the time it is pronounced in continuous reading. And this elongation makes the superheavy syllable /nɑ:s/ a prominent syllable in each verse in this chapter.

The phrase / ræb bɪn- nɑ:s / is written as / ræb bɪ- ʔæl nɑ:s /, but because of assimilation (ʔælʔɪdɣɑ:mʊʃ ʃæmsi:) and syllable blending(ʔælʔɪdmɑ:dʒʊl-mæqtˁæʕi:), it is pronounced and syllabified as /ræb bɪn- nɑ:s /. To explain, the second word /ʔæl nɑ:s / begins with the definite article /ʔæl -/ followed by one of the solar sounds which is /n/, thus under the influence of assimilation of manner of articulation, the lateral /l/ of the definite article is assimilated to the nasal /n/ making the word pronounced as /ʔæn nɑ:s/. When /ræb bɪ/ precedes /ʔæn nɑ:s /, syllable blending takes place, i.e. the /n/ of /ʔæn -/ is blended with the /bɪ/ of /ræb bɪ/ after eliding the glottal stop and the following short vowel of the definite article, hence the two words are pronounced and syllabified as /ræb bɪn- nɑ:s/.

Phrasal stress is assigned to the present verse after setting its prosodic hierarchical structure. Above the PWd constituent, the first prosodic constituent is the MiP which is represented by the construct state /**ræb bɪn- nɑ:s**/. The next layer up is occupied by two constituents, i.e. the MaP and the IP which are both represented by the verbal sentence **/ʔæ ʕu: ðʊ-** bɪ- **ræb bɪn- nɑ:s** /. The last prosodic constituent which is the U constituent is embodied by the entire verse /**qʊl- ʔæ ʕu: ðʊ-** bɪ- **ræb bɪn- nɑ:s**/. According to these constituents, phrasal stress can be assigned. In the MiP layer, a grid mark is added on the word /**nɑ:s**/- the rightmost element of the construct state and the verse- final word of the present verse. The (MaP & IP) layer is also stressed by putting a grid mark on the word / **nɑ:s/** as it is the rightmost element of the MaP and IP constituents. ER/right finishes the process of phrasal stress assignment by adding the topmost grid mark on the verse- final word / **nɑ:s/** in the U layer. The grid below shows how phrasal stress is assigned to the present verse.

U	(			x)
MaP & IP		(		x)
MiP			(	x)
PWd	(x)	(x)	(x)	(x)
Ft	(x)	(x .)	(x .)	(x)
	qʊl ʔæ ʕu: ðʊ	bɪ	**ræb bɪ<n>**	**nɑ:<s>**

Figure (16): The Bracketed Grid of / qʊl- ʔæ ʕu: ðʊ- bɪ- ræb bɪn- nɑ:s/ Before the Application of the BA Rule

The grid above is well-formed in metrical terms, still it is not eurhythmic. Since it is an instance of making the taller taller, one rule can be applied to make the grid eurhythmic which is the BA rule. The BA rule works by adding one grid mark

over/ʕu:/ and two marks over /qul/. The figure below shows how the grid in (16) turns to be eurhythmic by the application of this rule:

U	(									x)
MaP & IP	**(x)**	(								x)
MiP	**(x)**	**(**		**x**		**)**		(		x)
PWd	(x)	(		x		)		(x	)	(x)
Ft	(x)		(x	.)		(x	.)			(x)
	qʊl	**ʔæ**	**ʕu:**	**ðʊ**	bɪ	**ræb**	**bɪ<n>**		**nɑ:<s>**	

Figure (17): The Eurhythmic Bracketed Grid of /qʊl- ʔæ ʕu: ðʊ- bɪ- ræb bɪn- nɑ:s/ After the Application of the BA Rule

The fourth type of grids in the analysed data is represented by grids which can be made eurhythmic by the use of the DG rule. There are two verses that follow this type of grids; the fourth verse of /ʔælfælæq/ and the fourth verse of /ʔænnɑ:s/ chapter. Below is the analysis of the fourth verse of /ʔælfælæq/ chapter that shows how the DG rule can work to make the grid eurhythmic.

L I H G F E DM

/wæ- mɪɲ- ʃær rɪn- næf fɑ: θɑ: tɪ – fɪl - ʕʊ qæd/ "*and from the evil of those who practice witchcraft when they blow in the knots,*"

The fourth verse of /ʔæl fælæq/ chapter is coordinated with the former verse /wæ- mɪɲ- ʃær rɪ- ɣɑ: sɪ qɪn- ʔɪ ðɑ:- wæqæb/. Al-Darwish (1999, p.453) analyses the present verse as follows: /wæ/ is a conjunction particle; /mɪɲ/ is a preposition that is followed by the prepositional complement /ʃær rɪn/ which is also the first member of a construct state. /næf fɑ: θɑ: tɪ/ is being analysed by Al-Darwish (1999)as the second member of the construct state modified by the prepositional phrase (fɪl- ʕʊ qæd), i.e. the preposition /fɪl/ plus the prepositional complement /ʕʊ qæd/(p.453).

The two words /ʃær rɪn- næf fɑ: θɑ: tɪ/ are written as /ʃær rɪ- ʔæl næf fɑ: θɑ: tɪ/, but pronounced and syllabified as /ʃær rɪn- næf fɑ: θɑ: tɪ/ because of two phonological processes: assimilation (ʔælʔɪdɣɑ:mʊʃ ʃæmsi:) and syllable blending (ʔælʔɪdmɑ:dʒʊl-mæqtˁæʕi:). To explain, the second word /ʔæl næf fɑ: θɑ: tɪ/ begins with the definite article /ʔæl-/ followed by the /n/ sound which is one of the solar sounds. This causes the alveolar lateral /l/ to be assimilated in manner of articulation to the alveolar nasal /n/ making the word pronounced and syllabified as /ʔæn næf fɑ: θɑ: tɪ/. The adjacency of /ʃær rɪ/ to /ʔæn næf fɑ: θɑ: tɪ/ results in blending the final light syllable of /ʃær rɪ/ with the initial syllable of /ʔæn næf fɑ: θɑ: tɪ/. In other words, under the influence of syllable blending the /n/ of /ʔæn/ is blended with the light syllable /rɪ/ of /ʃær rɪ/ after eliding the glottal stop and the following short vowel. The result is that the two words are pronounced and syllabified as /ʃær rɪn- næf fɑ: θɑ: tɪ/.

Moreover, the phonological process of syllable blending affects the pronunciation and the syllabification of the prepositional phrase /fɪl - ʕʊ qæd/. The two words are written as /fi: - ʔæl ʕʊ qæd/, but when these two words are pronounced

as one phrase, the glottal stop and the following short vowel /æ/ of the definite article /ʔæl/ are elided, then the /l/ is blended with the preposition /fi:/. However, before the blending process takes place, the long vowel of /fi:/ is shortened by long vowel shortening process (ʔæl ʔɪxtɪlɑːsʊl mæqtˤæʕi:) in which the /i:/ is changed into /ɪ/. Finally, the syllable blending is accomplished by making the prepositional phrase pronounced and syllabified as /fɪl - ʕʊ qæd/.

As for phrasal stress assignment, the verse's prosodic constituents mapped from syntactic constituents should be stated. These constituents are as follows: the MiP is represented by the construct state /wæ- mɪɲ -**ʃær rɪn- næf fɑ: θɑ: tɪ** /, while the bigger phrase /wæ- mɪɲ- **ʃær rɪn- næf fɑ: θɑ: tɪ** – fɪl **- ʕʊ qæd**/ stands for an MaP constituent. As a result, phrasal stress can be assigned by putting a grid mark over the word /**ʃær rɪn**/ as it is the leftmost element of the construct state in the MiP layer. The next layer up which is the MaP layer is assigned stress by the ER/right via putting the upmost X on the verse- final word /**ʕʊ qæd**/. The grid below shows the phrasal stress placement of the presnt verse.

MaP	(				x)
MiP		(x	)		
PWd		(x)	(x)		(x)
Ft		(x .)	(x) (x) (x .)		(x .)
	wæ mɪɲ	**ʃær rɪ<n>**	**næf fɑ: θɑ: tɪ**	fɪl	**ʕʊ qæ<d>**

Figure (18): The Bracketed Grid of /wæ- mɪɲ- ʃær rɪn- næf fɑ: θɑ: tɪ – fɪl - ʕʊ qæd/ Before the Application of the DG Rule

The grid in (18) lacks well-formedness since it violates the CoCoCo in the last column. Solving this problem requires the use of the DG rule as invoked by SEC beacause the grid is a case of making the shorter taller. Accordingly, one grid mark is added over /ʕu/ to make the grid well- formed, as shown below:

MaP	(				x)
MiP		(x	)		**(x)**
PWd		(x)	(x)		(x)
Ft		(x .)	(x) (x) (x .)		(x .)
	wæ mɪɲ	**ʃær rɪ<n>**	**næf fɑ: θɑ: tɪ**	fɪl	**ʕʊ qæ<d>**

Figure (19): The Eurhythmic Bracketed Grid of /wæ- mɪɲ- ʃær rɪn- næf fɑ: θɑ: tɪ – fɪl - ʕʊ qæd/ After the Application of the DG Rule

After the application of the DG rule, the grid becomes well- formed. It is also eurhythmic as it maintains a prominence relation between its columns as well as having an alternating stress pattern.

The fifth type of grids represents those grids which are eurhythmic in case three phrasal rules are applied, i.e. the DG, BA, and BA rules. These grids belong to two verses; the second and the third verses of /ʔænnɑ:s/ chapter. As an example of such grids, the third verse is analysed below.

LWVUM

/mæ lɪ kɪn- nɑ:s/ "*the King of mankind*"

This is the second verse of /ʔænnɑ:s/ chapter. It consists of only two words: /mæ lɪ kɪn/ and /nɑ:s/ which are analysed syntactically by Ibn-Khalawayh (1985,p.238) as: the appositive / mæ lɪ kɪn / which is also the first member of the construct state /mæ lɪ kɪn- nɑ:s /, and /nɑ:s/ as the second member of this construct state.

The construct state /mæ lɪ kɪn- nɑ:s/ is written as /mæ lɪ kɪ- ʔæl nɑ:s/, but under the effect of syllable blending (ʔælʔɪdmɑ:dʒʊl-mæqtˁæʕi:) preceded by assimilation (ʔælʔɪdɣɑ:mʊʃ ʃæmsi:), it is pronounced and syllabified as /mæ lɪ kɪn- nɑ:s/. The word /nɑ:s/ is written with the definite article as /ʔæl nɑ:s/, but the process of assimilation causes the assimilation of the /l/ to the solar sound /n/ making the word pronounced as /ʔæn nɑ:s /. Syllable blending then, blends the final syllable of /mæ lɪ kɪ/ with the initial syllable of /ʔæn nɑ:s/. In this process, the /n/ is blended with /kɪ/ after eliding the glottal stop and the short vowel /æ/. The result is that the two words are pronounced as /mæ lɪ kɪn- nɑ:s/.

The present verse constitutes a construct state which is a two-word phrase, thus it stands for an MiP constituent when assigned phrasal stress. To give a clear rhythmic picture of the verse's phrasal stress, the first verse of /ʔæn nɑ:s/ chapter is rewritten with the replacement of the construct phrase /ræb bɪn- nɑ:s/ (found in the first verse) with the present construct state /**mæ lɪ kɪn- nɑ:s**/ as it is its appositive. Accordingly, the MaP, and the IP are represented by the verbal sentence /**ʔæ ʕu: ðʊ-** bɪ - **mæ lɪ kɪn- nɑ:s**/. The last prosodic constituent, i.e. the U constituent is represented by the bigger verbal sentence /**qʊl-ʔæ ʕu: ðʊ-** bɪ - **mæ lɪ kɪn- nɑ:s**/. With regard to these constituents, phrasal stress can be assigned to the present verse as follows; in the MiP layer, a grid mark is put on the word /nɑ:s/ -although it is the rightmost element of the construct state, yet, as it is the verse- final word of the present verse, it should be made more prominent than the leftmost word. The (MaP & IP) layer is stressed by adding a grid mark on the word /nɑ:s/ as well, since it is the rightmost element of the verbal sentence it is part of. Finally, ER/right puts the topmost X on the verse- final word /nɑ:s/ in the U layer. The grid below clearly shows how phrasal stress is assigned to the present verse.

U	(			x)
MaP & IP		(		x)
MiP			(	x)
PWd	(x)	(x)	(x)	(x)
Ft	(x)	(x .)	(x . .)	(x)
	qʊl	**ʔæ ʕu: ðʊ** bɪ	**mæ lɪ kɪ<n>**	**nɑ:<s>**

Figure(20): The Bracketed Grid of / qʊl-ʔæ ʕu: ðʊ- bɪ - mæ lɪ kɪn- nɑ:s / Before the Application of the GE, DG and BA Rules

Although the grid above is well-formed, still it lacks eurhythmy. As this grid is a case of making the taller taller, the BA rule can be applied to make it eurhythmic. However, before the application of the BA rule, another rule needs to be applied,

namely the GE rule. This rule works by adding an empty layer (above the word layer) to the grid. The empty layer is significant in allowing the addition of more grid marks on the constituents that are banned by the above bracketing. In the present grid, the word /mæ lɪ kɪn/ which is the leftmost word of the construct state should have a degree of prominence. Therefore, adding an empty layer by the GE rule allows adding a grid mark on this word. When the GE rule adds the empty layer, a violation of the CoCoCo takes place in that layer which invokes the application of the DG rule to satisfy the CoCoCo by adding a grid mark on the most prominent column in the grid. The BA rule then works by adding one grid mark over /mæ/ and two grid marks over /qʊl/. The result is a eurhythmic grid that shows a prominence relation between its prominent columns with an alternating stress pattern. The grids below demonstrate the application of these rules to the grid of (20):

U	(				x)
MaP & IP		(			x)
MiP				(	x)
					(x)
PWd	(x)	(x)		(x)	(x)
Ft	(x)	(x .)		(x . .)	(x)
	qʊl	**ʔæ ʕu: ðʊ**	bɪ	**mæ lɪ kɪ<n>**	**nɑ:<s>**

Figure(21): The Bracketed Grid of /qʊl-ʔæ ʕu: ðʊ- bɪ - mæ lɪ kɪn- nɑ:s/ After the Application of the GE and DG Rules

U	(				x)
MaP & IP		(			x)
MiP	**(x)**			(	x)
	(x)			**(x)**	**(x)**
PWd	(x)	(x)		(x)	(x)
Ft	(x)	(x .)		(x . .)	(x)
	qʊl	**ʔæ ʕu: ðʊ**	bɪ	**mæ lɪ kɪ<n>**	**nɑ:<s>**

Figure (22): The Eurhythmic Bracketed Grid of /qʊl-ʔæ ʕu: ðʊ- bɪ - mæ lɪ kɪn- nɑ:s/ After the Application of GE, DG and BA Rules

The other type of grids are those which are made eurhythmic by the application of DG and Move X rules. Only one verse in the analysed data belongs to this type which is the last verse of /ʔænnɑ:s/ chapter. Below is the analysis of this verse according to Hayes's (1995) metrical theory.

L i h g f M

/mɪ næl- dʒɪn næ tɪ – wæn- nɑ:s/ "*of jinn and men.*"

This verse is analysed syntactically by Ibn-Khalawayh (1985,p.240) as follows: /mɪ næl/ is a preposition that is followed by the prepositional complement /dʒɪn næ tɪ/. This prepositional phrase is followed by the conjunction particle /wæ/ syllabified as /wæn/ plus /nɑ:s/- a noun that is coordinated with the prepositional complement /dʒɪn næ tɪ/.

The first word /dʒɪn næ tɪ/ is written as /ʔæl dʒɪn næ tɪ/, but under the influence of syllable blending (ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:), the final syllable of the preposition /mɪ næ/ that precedes this word is blended with the definite article /ʔæl/ that begins it. Hence, the /l/ is blended with /næ/ after eliding the glottal stop and the following short vowel /æ/. The result is the following pronunciation and syllabification: / mɪ næl- dʒɪn næ tɪ/

Moreover, the second word /nɑ:s/ is written as /ʔæl nɑ:s/. The phonological process of assimilation, as previously explained, makes /ʔæl nɑ:s/ pronounced as /ʔæn nɑ:s/. Then, syllable blending (ʔælʔɪdmɑ:dʒʊl-mæqtˤæʕi:) blends the monosyllabic particle /wæ/ with the initial syllable of /ʔæl nɑ:s/ causing them to be pronounced as /wæn- nɑ:s/.

Assigning phrasal stress to the present verse is preceded by setting its prosodic constituents. A short verse like the one under investigation is composed of only one prosodic constituent which is an MiP constituent. This constituent is represented by two nouns related to each other by the conjunction particle /wæ/, that is, /mɪ næl- **dʒɪn næ tɪ**- wæn- **nɑ:s**/. As this verse is related to the preceding verse /**ʔæl læ ði: - jʊ wæs wɪ sʊ** - fi: **- sˤʊ du: rɪn- nɑ:s**/ syntactically and semantically, the two verses are analysed together so as to have a clear rhythmic picture of the present verse. Accordingly, the MiP constituents are represented by: first,/ **ʔæl læ ði: - jʊ wæs wɪ sʊ**/, second, /fi: **- sˤʊ du: rɪn- nɑ:s**/, and third,/ mɪ næl- **dʒɪn næ tɪ –** wæn**- nɑ:s**/. The MaP constituent is represented by the bigger verb phrase /**ʔæl læ ði: - jʊ wæs wɪ sʊ-** fi: **- sˤʊ du: rɪn- nɑ:s**/. And, the IP constituent is represented by the bigger sentence /**ʔæl læ ði: - jʊ wæs wɪ sʊ-** fi: **- sˤʊ du: rɪn- nɑ:s** -mɪ næl- **dʒɪn næ tɪ –** wæn**- nɑ:s**/.

The aforementioned prosodic constituents determine how phrasal stress is assigned to the two verses. Accordingly, an X is added on the word /**jʊ wæs wɪ sʊ**/ as it is the rightmost element of the first MiP constituent, another X is added on the word /**sˤʊ du: rɪn**/ - the leftmost element in the construct state /**sˤʊ du: rɪn** – **nɑ:s**/, and an X is put on the word /**nɑ:s/** which is the rightmost element of the third MiP. The next layer up which is occupied by the MaP constituent is stressed by putting a grid mark over the word /**sˤʊ du: rɪn**/- the rightmost prominent element in the MaP layer. Finally, ER/right adds the topmost grid mark on the verse– final word /**nɑ:s/** to make it the most prominent word in the grid. The following grid shows how phrasal stress can be assigned to this syntactic structure:

```
IP    (                                                           x)
MaP   (                         x         )
MiP   (          x      )   (   x         )        (             x)
PWd   (x  )    (    x   )   (   x  )   (x)         (x      )     (x)
Ft    (x .)       (x  . .)     (x .)   (x)         (x   . .)     (x)
      ʔæl læ <ði:> jʊ wæs wɪ sʊ  fi: sˤʊ du: rɪ<n>  nɑ:<s>  mɪ næl  dʒɪn næ tɪ  wæn- nɑ:<s>
```

Figure (23): The Bracketed Grid of /ʔæl læ ði: -jʊ wæs wɪ sʊ- fi: - sˤʊ du: rɪn- nɑ:s- mɪ næl- dʒɪn næ tɪ – wæn- nɑ:s/ Before the Application of the DG and Move X Rules

The grid in figure (23) violates the CoCoCo, thus it is not well-formed. As it is a case of making the shorter taller, one rule can be applied to fix the ill-formedness of the grid which is the DG rule invoked by SEC. This rule creates a domain over /nɑ:/ by adding one grid mark to satisfy the CoCoCo, as shown in the grid below:

```
IP    (                                                       x)
MaP   (                            x          )       (        x)
MiP   (             x      )    (  x          )       (        x)
PWd   (x  )     (   x      )    (  x  )   (x)         (x    )  (x)
Ft    (x .)         (x  . .)       (x .)  (x)         (x . .)  (x)
      ʔæl læ <ði:>  jʊ wæs wɪ sʊ  fi: sˤʊ du: rɪ<n>  nɑ:<s>  mɪ næl  dʒɪn næ tɪ  wæn- nɑ:<s>
```

Figure (24): The Bracketed Grid of /ʔæl læ ði: - jʊ wæs wɪ sʊ- fi: - sˤʊ du: rɪn- nɑ:s- mɪ næl- dʒɪn næ tɪ – wæn- nɑ:s/ After the Application of the DG Rule

After achieving the grid’s well-formedness, the next step is to make the grid eurhythmic. Since there is a stress clash between /nɑ:/ and /du:/, the Move X rule can be applied to move the grid mark of /du:/ leftward to anchor on /wæs/. In this way the stress clash is resolved and a distance of a four- syllable space is created between the prominent columns in the grid. The result is the eurhythmic grid shown in figure (25) below:

```
IP    (                                                       x)
MaP   (             x  ←—————————         )       (        x)
MiP   (             x      )    (  x          )       (        x)
PWd   (x  )     (   x      )    (  x  )   (x)         (x    )  (x)
Ft    (x .)         (x  . .)       (x .)  (x)         (x . .)  (x)
      ʔæl læ <ði:>  jʊ wæs wɪ sʊ  fi: sˤʊ du: rɪ<n>  nɑ:<s>  mɪ næl  dʒɪn næ tɪ  wæn- nɑ:<s>
```

Figure (25): The Eurhythmic Bracketed Grid of /ʔæl læ ði: - jʊ wæs wɪ sʊ- fi: - sˤʊ du: rɪn- nɑ:s- mɪ næl- dʒɪn næ tɪ – wæn- nɑ:s/ After the Application of DG and Move X rules

n of

the DG, BA, and Move X rules. This type of grid is embodied by the verse (بسم الله الرحمن الرحيم) (the opening verse of the Qur’anic recitation) is analysed below.

L % $ # " ! M

/bɪs mɪl- lɑ: hɪr- ræħ mɑ: nɪr -ræ ħi:m/ “*In the name of Allah, the Most Gracious, the Most Merciful*”

According to Ibn-Khalawayh (1985,p.9), the /bɪ-/ is analysed syntactically as a preposition that is followed by the prepositional complement /ʔɪsmɪl/ to become /bɪsmɪl/ after eliding the /ʔ/ for ease of articulation. /bɪsmɪl-lɑ:hɪr/ is a construct state in which /bɪsmɪl/ represents the first member of the construct state while /lɑ:hɪr/ is the second member of the construct. The last two words /ræħ mɑ:nɪr/ and /ræ ħi:m/ are both adjectives modifying the noun /ʔæl lɑ: hɪ/ that is syllabified as /lɑ: hɪr/ (Ibn-

Khalawayh,1985,p.12).

The word /bıs mıl/ is written as /bı- ʔısmı/, but in Qur'anic recitation, it is pronounced as /bıs mıl/. Similarly, the remaining words /lɑ: hır/, /ræh mɑ: nır/ and /ræ hi:m/ are written as /ʔæl lɑ:hı/, /ʔæl ræħ mɑ:nı/, and /ʔæl ræ ħi:m/ respectively. Two phonological processes are at work in this verse: syllable blending (ʔælʔıdmɑ:dʒʊl-mæqtˁæʕi:) and assimilation (ʔælʔıdɣɑ:muʃ ʃæmsi:). Under the effect of syllable blending, the glottal stop and the following vowel of the word /ʔısmı/are elided for ease of articulation, then the remaining consonant /s/ is blended with the preposition /bı/ making the word pronounced as /bıs mıl/.

Moreover, the /mı/ of /bısmı/ is blended with the /l/ of /ʔæl lɑ:hı/ after the elision of the glottal stop and the following /æ/ of /ʔæl lɑ:hı/ making the two words pronounced and syllabified as /bıs mıl – lɑ:hı/. On the other hand, the two adjectives /ʔær ræħ mɑ:nı/ and /ʔær.ræ.ħi:m/ are influenced by assimilation of manner of articulation of the type (ʔælʔıdɣɑ:mʊʃ ʃæmsi:) which assimilates the lateral /l/ of the definite article /ʔæl-/ to the following solar sound (the trill /r/ in both cases). Orthographically, the two words are written as /ʔæl ræħ mɑ:nı/ and /ʔæl ræ ħi:m/, but under the influence of assimilation, the /l/ is assimilated to the /r/ which makes the two words pronounced as: /ʔær ræħ mɑ: nı/ and /ʔær.ræ.ħi:m/. Afterwards, syllable blending works between the two words: /lɑ: hı/ and /ʔær ræħ mɑ:nı/, consequently, the final syllable of / lɑ: hı/ is blended with the initial syllable of /ʔær ræħ mɑ:nı/ after eliding the glottal stop and the short vowel that follows it to shape the two words as /lɑ: hır - ræħ mɑ: nır/. The same process is applied to /ʔær ræħ mɑ:nı - ʔær ræ ħi:m/.

As /ræ ħi: m/ constitutes a verse –final word, its long vowel /i:/ is lengthened by the type of elongation called elongation occasioned by finality (ʔælmæddʊl ʕɑ:rıdˁ lıssıku:n). The word /ræ ħi:m/ in continuous reading is read as / ræ ħi: mı/, but in pausing when it occurs as a verse –final word, the short vowel of the final syllable /mı/ is elided and its onset consonant is attached to the preceding heavy syllable making it a superheavy one, i.e. / ħi: m/. This makes the long vowel /i:/ lengthened twice or thrice the time it is usually pronounced in continuous recitation.

In the light of prosodic hierarchy theory, utterances are phrased into prosodic constituents that are mapped from syntactic constituents specifically those above the word layer. Consequently, four prosodic layers are to be specified, i.e. the MiP, the MaP, the IP and the U layers. In this verse, the MiP is represented by the noun phrase (lɑ: hır -ræħ mɑ: nır), i.e. a noun modified by an adjective. MaP which equates an XP, is represented here by the noun phrase (lɑ: hır -ræħ mɑ: nır- ræ ħi:m) which is a noun followed by two adjectives modifying it. The prepositional phrase /bıs mıl/ and the rest of the verse: /lɑ: hır - ræħ mɑ: nır- ræ ħi:m/ constitutes a construct phrase, so it stands for another MaP.

After establishing the verse's prosodic constituency, it is now qualified to be assigned phrasal stress by using Hayes's bracketed grid model. As phrasal stress in Arabic is assigned to the rightmost element, in the MiP layer an X is assigned to / ræħ mɑ: nır/ which is the rightmost element in the phrase (lɑ: hır -ræħ mɑ: nır). The next layer up also has the grid mark on the rightmost word which is /ræ ħi:m/. Similarly, in the last MaP layer, the topmost grid mark is put on the word /ræ ħi:m/ by ER/right.

The following figure shows the grid that represents the phrasal stress of " bɪs mɪl - lɑ: hɪr - ræɦ mɑ: nɪr -ræ ɦi:m":

MaP	(			x)
MaP		(		x)
MiP		(	x)	
PWd	(x)	(x)	(x)	(x)
Ft	(x .)	(x .)	(x) (x .)	(x)
	bɪs mɪ<l>	lɑ: hɪ<r>	ræɦ mɑ: nɪ<r>	ræ ɦi:<m>

Figure (26) The Bracketed Grid of /bɪs mɪl- lɑ: hɪr- ræɦ mɑ: nɪr -ræ ɦi:m/ Before Applying DG , BA and Move X Rules

The grid above is not well-formed because it violates one metrical rule which is the CoCoCo in the last column as there is a gap between the grid marks in the last column. This case is a case of making the shorter taller in which the column should be made the taller by applying the DG Rule invoked by SEC. In this case, an additional grid mark is added to the last column to be the landing site of the above grid marks so as to obey the CoCoCo, as shown below.

MaP	(			x)
MaP		(		x)
MiP		(	x)	**(x)**
PWd	(x)	(x)	(x)	(x)
Ft	(x .)	(x .)	(x) (x .)	(x)
	bɪs mɪ<l>	lɑ: hɪ<r>	ræɦ mɑ: nɪ<r>	ræ ɦi:<m>

Figure (27)The Bracketed Grid of /bɪs mɪl- lɑ: hɪr- ræɦ mɑ: nɪr -ræ ɦi:m/After Applying DG , BA, and Move X rules

Although the grid above obeys the CoCoCo and the Faithfulness Condition, still it is not eurhythmic. To achieve eurhythmy, metrical phrasal rules should be applied. In this case, two metrical rules can be used: BA rule can be applied by adding two grid marks over /bɪs-/, and the Move X rule works by moving the grid mark of /mɑ:/ leftward to /lɑ:/ to have a eurhythmic grid as shown below:

MaP	(			x)
MaP	(**x**)	(		x)
MiP	(**x**)	(**x** ←	)	**(x)**
PWd	(x)	(x)	(x)	(x)
Ft	(x .)	(x .)	(x) (x .)	(x)
	bɪs mɪ<l>	lɑ: hɪ<r>	ræɦ mɑ: nɪ<r>	ræ ɦi:<m>

Figure (28) The Eurhythmic Bracketed Grid of /bɪs mɪl- lɑ: hɪr- ræɦ mɑ: nɪr -ræ ɦi:m/ After the Application of DG Rule, BA, and Move X rules

14-Conclusion:

The present study investigated the syllable patterns of (32) Qur'anic words of /ʔælfælæq/ and /ʔænnɑ:s/ chapters. After setting the relevant parameters for CA, word stress was assigned; and metrical feet were built over each syllable pattern by the use of bracketed grids to monosyllabic, disyllabic, trisyllabic and tetra syllabic words.

In addition, the analysis of word stress and phrasal stress of the two Qur'anic chapters gave the following two conclusions:

1- Assigning stress and building metrical feet over the Qur'anic words were successfully accomplished by setting the parameters of CA word stress system with the aid of some metrical rules like ER/right, the Priority Clause Principle, and extrametricality.

2- The rhythmicity of the Qur'anic verses of /ʔælfælæq/ and /ʔænnɑ:s/ chapters is best shown and represented by the use of Hayes's bracketed grid model. This rhythmicity is embodied in the alternating stress pattern of the Qur'anic words in each Holy verse the fact that verifies the study's hypothesis.

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الخلاصة:

يتناول هذا البحث دراسة نبر الكلمات والايات القرانية في سورتي الفلق والناس وذلك بحسب نظرية النبر المترية(metrical stress theory) لهيز سنة ١٩٩٥. تفترض هذه النظرية أن عملية نبر كلمات اي لغة في العالم يمكن ان تتم بتوجيه المعايير والضوابط الخاصة بكل لغة. وهذه المعايير تشمل: معيارتأثر اللغة بثقل المقطع وحجم الوحدة المترية التي تدعى بالتفعيلة (foot) وتكرارية التفعيلة واتجاهها واتجاه رأس التفعيلة. كما وتفترض هذه النظرية بأن التركيب الايقاعي لاي لغة يمكن تجسيده في عملية نبر الكلمات و الجمل باستخدام انموذج الشبكة ذات الاقواس.

وقد اظهرت النتائج ان تحليل نبر الكلمات القرانية قد تحقق بفاعلية باستخدام نظرية هيز بعد وضع المعايير الخاصة باللغة الفصحى القديمة والتي تشكل لغة القران منها جزءا ، كما واظهرت الدراسة ان التركيب الايقاعي للآيات القرانية قد تم اظهاره بواسطة الايقاع المتناوب للمقاطع المنبورة وغير المنبورة وذلك باستخدام انموذج الشبكة ذات الاقواس وبالاستعانة ببعض قوانين نبر الجملة.