Firthian Prosodic Approach: 
Evidence From Arabic

Bashar Al-Rashdan

Department of English, Mu'ah University, Al-Karak, Jordan

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Abstract

Preoccupation with the narrow segmentalism of phonemics has entailed the ignoring of many regularities extending beyond the domain of the phoneme. Firthian prosodic analysis rejects this purely segmental, ‘linear’, phonemic analysis, and assigns phonological features to prosodies which are non-segmental entities that can be tied to any level or aspect of phonology – spread over a whole word, or root, or syntactic unit, or syllable, or a part of a syllable, for example. This paper, it is hoped, will demonstrate the value of prosodic analysis, particularly as applied to Arabic, since it is able to capture phenomena that traditional structural phonemic analysis fails to bring out.

Keywords: Segmentalism, phonemics, prosodic analysis, Arabic.
Brief reading conventions pertaining to some Arabic sounds

Consonants:

ʔ glottal stop
θ voiceless, dental, fricative.
δ voiced, dental, fricative.
š voiceless, palato-alveolar, fricative.
š′ voiceless, dento-alveolar, emphatic fricative.
d′ voiced, dento-alveolar, emphatic plosive.
t′ voiceless, dento-alveolar, emphatic plosive.
j voiced, palato-alveolar, affricate.
h voiceless, pharyngeal fricative.
h′ voiced, pharyngeal fricative.
q voiceless, uvular plosive.
g voiced, uvular fricative.

Vowels:

i high front
e mid front
a low front
u high back

A colon /:/ following a vowel sound indicates length, i.e., long vowel.

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Introduction

According to J.R.Firth, the founder of the British school of linguistics, and his colleagues and students, the so-called prosodic phonologists (e.g. T.F.Mitchell, W.S.Allen, T.Hill, R.H.Robins, E. J.A.Henderson. (cf. In Memory of J.R.Firth edited by C.E.Bazell et al (1966)), phonemics in all its forms gives undue weight to the contrastive or paradigmatic aspect of phonology and neglects the syntagmatic aspect. As Sommerstein says, “The aim of prosodic phonology is, among other things, to integrate the syntagmatic and paradigmatic statement in a single unified description.”

Thus, an important role is given to phonological features and peculiarities characteristic of a unit of structure (e.g. syllable, word, syllable-part, word-part ... etc.) rather than to just one segment (i.e., vowel or consonant). Such features include stress, length, pitch, nasalization, vowel harmony, ... etc. Any feature extending over more than one segment is abstracted from the phonological system of a language and considered a prosody.
J.R. Firth's prosodic approach to the study of phonological systems of languages is summarized as follows by Firth himself in his paper “Sounds and prosodies” published in his Papers in Linguistics 1934-1951 pp.121-138. He says:

“By using the common symbols c and v instead of the specific symbols for phonematic consonant and vowel units, we generalize syllabic structure in a new order of abstraction eliminating the specific paradigmatic consonant and vowel systems as such, and enabling the syntagmatic word structure of syllables with all their attributes to be stated systematically. Similarly we may abstract those features which mark word or syllable initials and word or syllable finals or word junctions from the word, piece, or sentence, and regard them syntagmatically as prosodies, distinct from the phonematic constituents which are referred to as units of the consonant and vowel systems.2

Firth gives as an example of word junction the sentence (question) ‘Is she?’, which, he says, is phonetically transcribed as /iʃ/. Here the orthographic space between the two words is replaced by the junction sequence ʃ. Such a sequence in spoken English is abstracted as a prosody and is generalized beyond the phonematic level as fi, where the symbols f and i stand for word final and word initial, respectively. It must be emphasized that the sequence ‘fi’ which is a mark of word junction in spoken English is considered in Firthian terms a prosodic feature, over and above the abstract phonematic units.

Many types of ‘sound’ can be treated as prosodies. For instance, the weak vowel, i.e., the schwa /ə/ in English, the glottal stop in Arabic and aitch (or the pulmonic onset), the so-called ‘intrusive’ r, the liquids l,r,n, and the semi-vowels.

The schwa /ə/ in English is often associated with the prosodies of English words and junctions. It differs from the phonematic units of other English vowels in that the schwa never carries strong stress. As Firth says: “Unlike the phonematic units, it does not bear any strong stress. Its occurrence marks a weak syllable including weak forms such as wəz, kən, ə.”3

The schwa plays a significant prosodic function in English. Consider, for instance, the phrase Black and white where the conjunction ‘and’ is normally rendered as a weak form variously pronounced as ənd, an, n/. Arab speakers of English as a foreign language usually distort the rhythm of this language as they do not produce the weak form of the schwa where necessary.

In the above example, they render the conjunction with a full front, nearly open vowel quality, viz, ənd/ and, furthermore, associate strong stress with it. It must be added that native speakers of English do, in certain contexts, render the conjunction as a strong form for a certain semantic function. But the Arab non-native speakers rarely, if ever, differentiate between the weak and the strong form. They misuse the prosodic function of the schwa. Perhaps this problem is due to interference from Arabic where the vowels do not undergo a similar reduction in their qualities.

In one of its prosodic functions, the schwa in English might be regarded as a pro-syllable. As Firth puts it, “However obscure or neutral or unstressed, it is essential...
in *a bitter for me* to distinguish it from *a bit for me.* The former phrase contains an extra syllable, weak though it is, whose exponent is the schwa of the second syllable in *bitter.* This is what is meant by the pro-syllable prosodic function of the schwa in English.

In this article, an attempt is made to show some merits of Firth’s prosodic approach in studying the phonology of spoken languages. Examples are given from English and Arabic to support the advantages of the Firthian approach over the traditional, and perhaps more widespread, phonemic analysis.

**Theoretical Background**

Firth’s analysis posits two types of phonological units:

1. Phonematic units (e.g., vowels, and consonants)
2. Prosodic units (e.g. frontness, backness, rounding, breathiness, length, voicing, emphasis)

Different characteristics and functions of the phonematic units and the prosodies will be illustrated with reference to selected areas of the phonology of English and Arabic.

To start with, a prosody of lip rounding can be abstracted from the English word *food* /ˈfuːd/ to the effect that the lips take a rounded posture from the onset of articulating this word to the end of it. Using the system of abstract phonematic units (c and v) and the prosody of Rounding (+R), a more abstract representation of the word ‘food’ can now be rendered as:  

\[
\begin{array}{c}
\text{CVVC} \\
\hline
\text{+R} \\
\text{+L}
\end{array}
\]

Or if vowel length (+L) is also abstracted as a prosody, the word can be represented

\[
\begin{array}{c}
\text{CVVC} \\
\hline
\text{+R} \\
\text{+L}
\end{array}
\]

By abstracting the prosodies of vowel length and rounding, this system has the advantage of reducing the inventory of the traditional vowels of English to a bare minimum, not to mention the fact that the prosody of [+R] is now seen as a feature which characterizes the entire word, not just the vowel.

In contrast, and by a similar abstraction of phonematic units and prosodies, the word *feed* /fiːd/ can be represented as:

\[
\begin{array}{c}
\text{CVVC} \\
\hline
\text{+R} \\
\text{+L}
\end{array}
\]

The domain of each prosody needs to be defined. Thus [+L/-L] applies to the length of the vowel, and [+R/-R] in the above examples applies to the entire syntagmatic sequence.

The words *hood* /hʊd/ and *hid* /hid/, with [-L] can be represented respectively as:

\[
\begin{array}{c}
\text{CVVC} \\
\hline
\text{+R} \\
\text{-L}
\end{array}
\] 

\[
\begin{array}{c}
\text{CVVC} \\
\hline
\text{-R} \\
\text{-L}
\end{array}
\]
If a new prosody is abstracted in relation to vowel height in English such that pure English vowels are considered high (h), mid (m) or low (l), the structure of English syllables, including monosyllabic words, can be accounted for in terms of the generalized phonematic units c and v, and the prosodies of Rounding (+R, -R), vowel Length (+L, -L) and vowel Height (h, m, l). The generalized phonematic units of English syllable structure are:

(c) (c) (c) v (c) (c) (c) (c)

In this structure, the vowel is obligatory and the consonants are not. This structure will account for the following types of syllables, among others:

- v [-R, +L, +h] --- e.g. ah
- cv [+R, +L, +h] --- e.g. coup
- cvc [-R, -L, +h] --- e.g. fat
- cvc [+R, +L, +h] --- e.g. food
- cvc [-R, +L, +h] --- e.g. feed
- cvc [-R, -L, +m] --- e.g. head
- cvcc [-R, -L, +m] --- e.g. help
- cvcc [-R, +L, +h] --- e.g. field
- cvcccc [-R, -L, +h] --- e.g. sixths
- vc [-R, +L, +h] --- e.g. eat
- vc [+R, +L, +h] --- e.g. ooze
- cccvccc [-R, -L, +h] --- e.g. splints

To account for a syllable whose nucleus is a diphthong (not a pure vowel) the above generalized form may need some adaptation. Equally, syllables beginning with the labiovelar semi-vowel e.g. weed /wiːd/ will have to be split into two prosodies- the onset being [+R] and the rest of the word being [-R]. This, in addition to the other abstracted prosodies, gives:

wvc [+R][-R, +L, +h)].

Here the domain of [+R] is confined to the onset of the syllable, and [-R] to the remainder of the syllable. The other two prosodies apply as before. Note that this combination of [+R] and [-R] in respect of one and the same syllable does not arise in syllables like wood /wʊd/

wvc [+R, -L, +h].

With appropriate adaptation of the phonematic units and their sequence and recognition of appropriate prosodies (e.g. rounding, emphasis, prominence, … etc.), Arabic lends itself to a similar syllabic structure approach.

Prosodic features are also evident in English morpho-phonemics. Consider, the prosody of [ + voice ] and [ - voice ] in nouns (plurality and the possessive case) and verbs (3rd person singular and past tense) as illustrated below:

book books /bʊks/
where in the plural form a prosodic feature of [ - voice ] extends over the last two consonantal units. On the other hand, the pair:

\[ \text{fig figs / figz/} \]

exhibits a prosodic feature of [ + voice] extending over the last two consonants (and of course, in this example, the onset of voice starts with the high/close vowel I and continues to the end of the word).

Similarly in the third person singular of lexical (not modal) verbs the feature of voice exhibits like patterns, consider

\[ \text{(He) looks / luks/ [ - voice]} \]
\[ \text{(He) digs / digz/ [ + voice]} \]

The English regular past tense is also subject to such voice contrasts:

\[ \text{(to) look looked / lukt/ [ - voice]} \]
\[ \text{(to) kiss kissed / kist/ [ - voice]} \]
\[ \text{(to) hug hugged / h\^{\text{A}}gd/ [ + voice]} \]
\[ \text{(to) please pleased / pli:zd/ [ + voice]} \]

Note that, as Firth says, the /d/ segment has different phonological and morphological functions (and consequently different ‘modes of meaning’) in word final position:

\[ \text{board / b\langle \text{A}\rangle d/} \]
\[ \text{bored / b\langle \text{A}\rangle d/} \]

In the former it is just an original phonematic unit (or ‘a phonetic substitution-counter’); in the latter it is a past tense signal, (a morphological substitution-counter) This contrast is not operational word-initially or medially. As Firth says “Almost any type of ‘sound’ may have prosodic function, and the same ‘sound’ may have to be noticed both as a consonant or vowel unit and as a prosody.”

Nor can the presence or absence of voice be determined in advance as it were without consideration of contextualization. Firth puts it as follows “In cases where we have two letters such as s and z, roughly representing the negative and positive voice correlation, people may also talk of the unvoiced z and the voiced s, using four categories.” The predictability of the prosody [± voice] in these environments has implications for the English orthography. Thus the letter s is used to form the orthographic plural of the regular nouns:

- book – books
- dog – dogs

without causing confusion with regard to the appropriate phonetic realization of this letter; such realization is determined by the absence or presence of the feature of voice in the pronunciation of the last letter of the singular form so that [ + voice ] in the pronunciation of the last letter calls for [ + voice ] in the realization of the letter s of the plural, e.g.,
and conversely, [ - voice ] is followed by [ - voice ] e.g. book – books. As Firth says, “This use of s is not in contradistinction from z, as the two-term voice- correlation is not possible in this context.” In other words, English phonology does not permit the contrasts:

/buks/ vs. */bukz/  
nor :  
/dogz/ vs. */dogs/.

(The asterisked forms are inadmissible in English.)

The same is true with respect to the voice correlation in the regular past tense. Only one letter of the English alphabet, namely d, is used:  
looked /lʊkt/  
hugged /hʌgd/  
because the two-term voice correlation is also predictable and not contrastive in these environments, (i.e., */lʊkd/ and */hʌgd/ are inadmissible).

However, caution must be exercised not to generalize this phenomenon which, evidently, does not hold in the context of, say, nasals and laterals. Compare:

/pense /pens/ vs. pens /penz/  
tense /tens/ vs. tens /tenz/  
false /fəls/ vs. falls /fəlz/

Here the two-term voice correlation of assibilation is possible after nasals and laterals. And in such contexts voice contrasts can be said to have lexico-grammatical functions viz:

‘tense’ /tens/ is singular, ‘tens’ /tenz/ is plural, and these are two different items.

Before turning to Arabic, just one more example from English. The prosody of length applicable to English vowels is a well-known feature of the phonology of English. There are contrasts which are obvious to native and non-native speakers of English as i: vs i, u: vs u where length is easy to recognize. Compare ‘feel /fi:l/ and ‘fill’ /fil/, ‘fool’ /fu:l/ and ‘full’ /fʊl/. But there are more subtle contrasts of vowel length induced by the environment. Compare:

feel /fi:l/ and feet /fi:t/.
rude /ruːd/ and root /ruːt/.

The phonemic transcription suggests that these are minimal pairs, differing only in respect of one segment, namely the vowel. But students of English phonology know that to distinguish such pairs only in terms of the phonematic counters /iː/ vs /ɪ/ and /uː/ vs /ʊ/ is an oversimplification. Such oversimplification may be motivated by practical and pedagogic purposes, notably where non-native speakers of English are
concerned. In fact these pairs involve other phonetic differences which prosodic analysis reveals fairly clearly. These differences are captured by giving due consideration to the prosody of length in combination with the strength (fortis/lenis) of consonants and probably the two-term voice correlation. Note that in /fi:l/ and /ru:d/ the vowel is followed by a word-final weak (and voiced) consonant which has the effect of relatively increasing the length of the vowel. In contrast, /fi:t/ and /ru:t/ end with strong (and voiceless) consonants which, somehow, takes away a bit of the relative length of the preceding vowel. Note that for similar reasons bead, bid, and bed, have longer vowels than beat, bit, and bet.

The facts about vowel length in English are much more complex. A word-final vowel is longer than one followed by consonants. Inter-word juncture is also relevant here. (Cf. the length of the vowel in the word ‘true’ when it is followed by another word beginning with [+ voice ] or [ - voice ] e.g. true virtue, true account, true story) . The incidence of stress and accentuation are also factors in this respect.

Segmental phonemics all too often ignores such details, but Firth’s approach underlines them and gives them focus. This approach emphasizes the syntagmatic relations of prosodies and their domains of operation so that phonological features come to life in light of phonetic, lexical, and grammatical considerations of the syntagmatic type.

Firthians make no assumptions concerning linguistic universals. As Langendoen says “Features are assigned to prosodic or phonematic units ad hoc.” Perhaps it is fair to say that neither Firth nor any of his followers have provided a full and detailed analysis of the phonological system of any living language. Rather different authors of this school have selectively identified particular areas in particular languages and applied the Firthian prosodic approach to that area. For instance, Firth’s ‘On the analysis of the monosyllable in a Chinese dialect’, Mitchell’s‘ On prominence in Arabic’, Bendor-Samuel discussion of some prosodic features in Terena, and Henderson, exposition of on Vietnamese syllable structure, …etc., are representative examples.

Perhaps it is also fair to add that Mitchell’s work on Arabic accentuation is the most clear example of application of prosodic analysis to features of a world language. As Langendoen says “Mitchell’s paper, which is an extensive discussion of accentuation and other phonological phenomena related to syllable structure in Classical Arabic and in several modern dialects, is one of the most brilliant exemplifications of prosodic analysis ever to have appeared.”

Other phonological approaches have been concerned with features which are either present (or absent) over an entire syllable or word …etc. Long components were posited (Harris,1945) to simplify the phonological description of a language by “reducing the number of phonemes, or the complexity of allophonic variation within each phoneme…[or] eliminating the limitations of distribution upon each phoneme” (quoted in Sommerstein,1977). Long components seem to have affinities with the
prosodic approach, but the details of the two approaches are different. The aim of prosodic approach, as stated above, was to integrate the syntagmatic and paradigmatic in one and the same system of description.

The present article was prompted by the writer’s interest in Firthian prosodic approach, notably by its superiority to a segmental approach. In particular, it is the excellent work of Mitchell and his students on Arabic which was instrumental in the writing of this article. The article is not meant to compare and contrast the various approaches to the study of the phonological systems of a natural language. As mentioned above, only segmental phonemics of the structuralist school is compared and contrasted with Firth’s approach. However, a brief statement is added about the auto-segmental approach; it shows the affinities between Firth’s approach and the more recent auto-segmental approach. Some prosodies are examined in the light of both approaches.

This paper is basically descriptive and it comprises some form of application of Firthian approach to prosodic analysis with an eye on the more recent developments in prosodic analysis.

**Analysis of Arabic Data**

Now Arabic is one of those languages where prosodic analysis is not only revealing, but also seems to be imperative. A few examples of such prosodies should suffice to make the point. First, consider the prosody of voice in the morphological structure of Arabic. The so-called triliteral root is an abstract base form of the bulk of Arabic morphemic constituency. Arabic grammarians and lexicographers rightly find it inevitable in handling linguistic facts and phenomena. Thus, from a single triliteral root (i.e., one with three consonantal radicals) several morphological forms are derived. For instance, the root : s-l-m yields a paradigm of forms including: salima, yaslamu, ?istalama, yastalimu, ?istila:m, sa:lim, sali:m, sallama, yusallimu, ?aslama, yuslimu, muslim, sala:m, sala:ma:t … etc.

All of these and related forms are derived from the root by recognizable and definitive affixes (prefixes, suffixes and infixes) which apply to virtually all Arabic roots in similar operations. Compare the following derivatives of the root ɣ-l-m: ɣalima, yaɣlamu, ?istaɣlama, yastaɣlimu, ?istiɣla:m, ɣa:lim, ɣali:m, ɣallama, yuɣallimu, ?aɣlama, yuɣlimu, muɣlim … etc. Of course certain forms may be unattested where certain roots are concerned.

Now consider the forms ?istalama, yastalimu, where a voiceless denti-alveolar stop /t/ is infixed. The corresponding forms derivable from the roots z-j-r, d-9-m, ẓ-b-ḥ are respectively:

**A.**

(i) ?iztajara, yaztajiru.
(ii) ?idtaɣama, yadtaɣimu
(iii) ?iøtabaḥa, yaøtabiḥu
But these six forms are not attested in Standard Arabic as portrayed at A; they are only the abstract underlying (and unpronounceable) forms, which, subject to the morpho-phonemic rules of Arabic, undergo certain transformations characterized by the prosody of voicing the clusters –zt-, –dt- and –dt-, thereby yielding the following realizations:

- –zd-, –dd-, and –ðd- respectively; i.e., the attested forms are as shown at B:

B.
(i) ṭızdajara, yazdajiru
(ii) ṭiddaʔama, yaddaʔimu
(iii) ṭîdabahha → ṭîdabahha
     yaðdabihu → yaððabihu

When a speech sound changes and becomes more like another sound which follows it or precedes it, this is called assimilation. The examples at (i) and (ii) exhibit what is called ‘partial assimilation’, whereby the feature, [+voice] spreads to cover more than one segment. The examples at (iii), however, exhibit what is called ‘complete assimilation’ in the sense that one sound becomes identical with a following or preceding sound.

In similar circumstances, spoken Cairene exhibits the prosody of voicing in words like:

ʔusbu: → ʔuzbu: ‘a week’

binnisba → binnizba ‘with respect to’

maṣgu:l → mažgu:l ‘busy’

ḥanild’al → ḥanivd’al ‘we will continue to’

kbi:r → gbí:r ‘big’

gaṣbin ʕannaha → gaZbin ʕannaha ‘against her will’

These examples from the Cairene vernacular show that when certain voiceless consonants are followed by certain voiced ones, a prosody of [+voice] extends backwards thereby making the two-consonant sequence voiced i.e:

s + b → zb (e.g. binnizba) ‘with respect to’

š + q → žg (e.g. mažgu:l) ‘busy’

f + c' → vč' (e.g havd'al) ‘i’ll remain’

k + b → gb (e.g. gbí:r) ‘big’

This seems to be peculiar to spoken Cairene Arabic, and it cannot be generalized without relevant evidence. Nor can it be said to apply across the board with respect to Cairene Arabic itself, i.e., it is not always the case that
Only under certain conditions having to do with the phonological features of the consonants in question does the rule apply. The specification of all the relevant features conducive to the operation of this prosodic rule is beyond the scope of this paper, but it may be noticed in passing that, insofar as these examples are concerned, the consonants in question are fricatives and stops, but not liquids.

The next feature to be cited here is the prosody of emphasis\textsuperscript{12}. Nonprosodic (phonemic) analysis deals with this issue by recognizing an inventory of nonemphatic consonants and another more limited inventory of emphatic consonants. The latter normally covers four coronal consonants:

- \textit{t}: (emphatic correlative of t)
- \textit{s}: (emphatic correlative of s)
- \textit{d}: (emphatic correlative of d)
- \textit{ð}: (emphatic correlative of ð)

Emphasis is then seen in contrastive pairs like: \textit{salb} ‘stealing, plunder’ vs. \textit{s’alb} ‘crucifixion’, \textit{sa ḥibah} ‘loose, unguarded’ vs. \textit{s’āḥibah} ‘hitting to the point’, \textit{taraf} ‘luxury’ vs. \textit{ṭaraf} ‘side/party’, and \textit{darb} ‘path, way’ vs. \textit{ḍarb} ‘beating, striking’

Such segmental analysis may be neat, but it terribly obscures the facts. Note that Arabic vowels in this approach are not divided into two categories: emphatic and non-emphatic. In fact, the vowels in this system are hardly given the attention they merit. Consideration of the above contrastive pairs readily shows that none of them are minimal pairs differing only with regard to one segment. Thus the first pair \textit{salb} \textit{s’alb} are phonetically speaking totally different from beginning to end. The consonantal articulation is ‘darker’, and the vowels are ‘retracted’ and ‘more open’ in /\textit{s’alb}/ than in /\textit{salb}/. A narrower phonetic representation reveals these contrasts as in:

\[
\begin{aligned}
\text{[~salb~]} & \text{ vs. [~s’alb~]}
\end{aligned}
\]

Now prosodic analysis handles these contrasts both more economically, and certainly more accurately. In this approach, emphasis/non-emphasis is abstracted as a two-term prosody located not in this segment or that, but extending over stretches beyond the segment. In the previous examples, for instance, the entire word \textit{salb} ‘plunder’ is characterized by the term non-emphatic whereas the word \textit{s’alb} ‘crucifixion’ is characterized by the term emphatic. That is to say, the prosody of emphasis makes the consonants darker and the vowels backer and more open in contrast with the corresponding counterparts in non-emphatic forms.
It must be pointed out that the domain of emphasis is not always an entire word as the example above shows; but equally, it is never located in a single phonematic segment, and that is what makes emphasis a prosodic feature. Consider:

\[ \text{saːl (-Emphasis) 'flowed'} \]
\[ \text{aβ (+Emphasis) 'hit'} \]
\[ \text{αːl (Onset and vowel +Emphasis, remainder –Emphasis) 'charged/assaulted'} \]
\[ \text{dark (Onset –Emphasis, vowel and remainder + Emphasis) 'house'} \]

Another example to be cited in this paper has to do with the junctural rules and regulations of Quranic recitation. For instance, when a word in the Holy Quran ending with an alveolar nasal is immediately followed by a word beginning with a voiced bilabial stop, the alveolar nasal consonant, in partial assimilation with the bilabial stop, is pronounced as a bilabial nasal, i.e.:

\[
\begin{align*}
\text{[ + Consonant ]} & \quad \rightarrow \quad \text{[ + Consonant

\text{[ + Alveolar + Nasal ]} & \quad \rightarrow \quad \text{[ + Bilabial + Nasal ]} & \quad \rightarrow \quad \text{[ + Consonant

\text{[ + Stop ]]} & \quad \rightarrow \quad \text{[ + Bilabial + Stop ]]}
\end{align*}
\]

This rule says that an alveolar nasal consonant\( /n/\) becomes a bilabial nasal\( /m/\) when it is followed immediately by a bilabial stop.

The rule applies within a word and across word boundary. Here are two examples:

(2) Across words: ‘\(\text{fa?in bagat \rightarrow fa?im bagat ‘ if she/it transgresses’}\)

Other Quranic recitation rules involving assimilation and analysable prosodically include the following:

1. \[
\begin{align*}
\text{[ + C }\quad \text{[ + Semi-vowel

\text{[ + Alveolar + Nasal ]} & \quad \rightarrow \quad \text{[ + palatal ]} & \quad \rightarrow \quad \text{[ + Semi-vowel

\text{[ + palatal ]]} & \quad \rightarrow \quad \text{[ + palatal ]]}
\end{align*}
\]

e.g.,

\(\text{man + yaʃmal \rightarrow mayyaʃmal ‘ anyone who has done’}\)
\(\text{lan + yuqbal \rightarrow layyuqbal ‘ it won’t be accepted’}\)

2. \[
\begin{align*}
\text{[ + C }\quad \text{[ + Alveo-palatal

\text{[ + Alveolar + Nasal ]} & \quad \rightarrow \quad \text{[ + Alveo-palatal + Trill ]} & \quad \rightarrow \quad \text{[ + C

\text{[ + Top ]]} & \quad \rightarrow \quad \text{[ + Alveo-palatal + Top ]]}
\end{align*}
\]

e.g., \(\text{min +rizqih \rightarrow mirrizqih}\)
These three prosodies involve consonantal length due to the process of assimilation, as the nasal consonant assimilates to the immediately following segment. Moreover, a prosody of nasalization extends over the resulting geminate cluster and perhaps also over other portions of the word, if not the entire word in, e.g.,

mallam

Finally, in Quranic recitation a prosody of vowel length (a nonphonemic prosodic feature not unlike that of the comparable prosody of vowel length in English mentioned above) is triggered under certain contextual conditions. These conditions include the occurrence of a vowel immediately before a glottal stop, both within the word and across word boundaries. Here are some examples:

/wassama?:?i/ ‘swearing by the sky/Heaven’

where the nucleus of the penultimate syllable is characterized by extra-lengthening in Quranic recitation. Such vowel length, according to recitation rules, is even greater across word boundaries, e.g.,

/ma: ?amartani: bih/ ‘what you have ordered’

/la: ?a?budu/ ‘I worship not’

This prosody is generalizable as:

In addition, and providing the environment permits, other prosodies may accompany the juncture, e.g. nasalization in such contexts as:

/ma: ?martani:/

The feature of vowel length also occurs in utterance final closed syllables with a long vowel, e.g.,

/rabb?i fla?am:in/ ‘Lord of the worlds’

/sini:n/ ‘proper name of a place’

Another context where long vowels are pronounced with extra length in Quranic recitation is given by the following formula:
These conventions of the prosody of extra vowel-lengthening can be captured by a general phonological rule, viz:

\[
\begin{align*}
\text{[+V] + Long} & \quad \rightarrow \quad \text{[+ Extra length] + C + Geminate} \\
\end{align*}
\]

e.g. /ʔa:ddi:n/ ‘those who keep account’
/wala ša:lli:n/ ‘those who go not astray’

Again, the junction of /t/ and /d/ produces a prosody of \[\pm\] voice] with backward assimilation as in:

\[
?aθqalat + daʔawa: \rightarrow ?aθqaladdaʔawa: ‘(when) she conceived,
\]

\[
\uparrow\]

\[
wamahhadtu \rightarrow wamahhattu ‘And I greatly facilitated (things) for him’
\]

\[
\uparrow\]

Many such prosodic features are attested in Standard and Colloquial Arabic. Cf:

\[
?\text{insaraqat da:ruh} \rightarrow ?\text{insaraqadda:ruh} ‘His house was robbed’
\]

\[
\uparrow\]

\[
fassadtuh \rightarrow fassattu ‘I spoiled it’.
\]

**Conclusion**

Firthian prosodic approach, as expounded in this paper, has very strong affinities with the auto-segmental approach espoused by Goldsmith in his PhD thesis (1976). Goldsmith rejects, albeit not outright, the idea that phonological representations underlying any utterance are made up of a matrix of distinctive features which are syntagmatically ordered and with each matrix mapped onto a single segment. This is the view Chomsky and Halle had in their monumental work on English phonology, *The Sound Pattern of English*, (1968). Goldsmith’s interest in phonology stems originally from his work on tone and vowel harmony in languages such as Igbo and Margi. He conceives of phonological representation as no longer a linear sequence of phonemes and a collection of processes which describe the changes which occur in this sequence. Instead, he proposes to represent phonological
phenomena as multi-dimensional having several tiers. The tiers (i.e., segmental and
tonal) are linked to each other by what he calls association lines. The association
between segmental and tonal tiers, according to Goldsmith, is governed by the
following constraint:

Well-formedness Condition (WFC)

a. Every tonal element is associated with at least one tone-bearing element;
   and every tone-bearing element is associated with at least one tonal
   element.

b. Association lines do not cross.

This multi-linear conception of phonological representation was later picked up
by McCarthy (1979,1981) who extended the empirical coverage of this theory with its
wide-spread ramifications, to other languages, Arabic included. According to
McCarthy, Arabic morpho-phonemic structures are analyzed in terms of a template
with the vowels and consonants no longer interspersed with one another but
abstracted and projected nonconcatenatively on distinct and separate tiers. For
instance, the canonical structure CVCVC is auto-segmentally represented as:

\[
\begin{array}{c|c|c|c|}
\text{Consonantal tier} & \text{Skeletal tier} & \text{Vowel tier} \\
\hline
/ & \mid & \backslash \\
CVCVC & \mid & \backslash \\
\end{array}
\]

A word like \textit{katab} ‘he wrote’, therefore, has the following structure

\[
\begin{array}{c|c|c|c|c}
k & t & b & | & | \\
\hline
| | | | |cvcvc | | | | | |
\end{array}
\]

A word like \textit{kutib} ‘was written’ is likewise represented as:

\[
\begin{array}{c|c|c|c|c}
k & t & b & | & | \\
\hline
| | | | |cvcvc | | | | | |
\end{array}
\]

The skeletal tier (cf. phonematic units) might be called an archisegment in the
sense that it is abstract and unpronounceable. It is precisely the interplay of the
consonantal and vocalic tiers that gives life to this structure. (Cf. Mitchell “Not of the
letter, but of the spirit; for the letter killeth, but the spirit giveth life.” \cite{13})

Vowel harmony in the Arabic words \textit{fulful} ‘pepper’ \textit{falfal} ‘he added pepper’ and
the vernacular \textit{fifil} ‘pepper’ are respectively represented auto-segmentally as:

\[
\text{fulful falfal fifil}
\]
Notice here that the harmonizing feature appears on a separate tier from the segmental string. Of course, the forms *fulfil, filful, falfal, fulfal* are not attested in Arabic.

Now let’s see how auto-segmental phonology analyzes some of the prosodic features examined using Firth’s approach. Two examples should suffice to illustrate the point.

First, consider the difference between *salb* and $s'alb$ mentioned above (p.13). The word $s'alb$, as is well known, is characterized by the prosody [+Emphatic] which spans the whole word and is encoded on a separate tier with surgical precision tasks. Auto-segmentally the word $s'alb$ is represented:

```
salb ' crucifixion'
| | | |
[+Emphatic]
```

The examples taken from Cairene Arabic (p.11) can all be represented with the feature [+ voice] spreading over adjacent segments, viz:

```
binnisba ' with respect to'
| |
[ +voice]
```

The auto-segmental approach though given short shrift has striking resemblance with Firth’s prosodic approach. The purely segmental phonemic analysis is rejected in both approaches, and prosodies or phonological features are treated as non-segmental entities that can be tied to any level or aspect of phonology-spreading over a whole word, or syllable, or a syllable part and even across word boundaries. Fox(2000:preface) says “ …research in our field is not a simple linear progression towards an ever greater understanding of linguistic phenomena and increasingly adequate models. More than once we find that earlier insights are lost when the overall models in which they are expressed are rejected, only to be reinvented later and proclaimed as new discoveries.”14

It is hoped that this article has provided some evidence to support Firth’s prosodic approach in the study of language. Firth’s approach, as this article attempts to show, is meaningful and relevant. Students of language gain interesting insights by adopting this approach in their linguistic investigations. Evidently, there are interesting phonological connections between Firth’s prosodic approach and the more recent auto-segmental approach as shown by the above-mentioned illustrative examples.
Endnotes

3. Ibid., 131.
4. Ibid., 132.
5. Ibid., 20
6. Ibid., 131.
7. Ibid., 131.
8. Ibid., 23.
10. Ibid., 101.
11. Sommerstien, 56.
12. Emphasis in Arabic phonetics and phonology is realized in articulatory terms as follows:
   In the articulation of the emphatic sequence $\tilde{\alpha}:b$ 1. the body of the tongue is laterally expanded along its length, 2. the tongue assumes a concave posture and is in contact with the upper teeth, the alveolar ridge and the front part of the palate, 3. when the contact is suddenly released an explosion is heard, but the concave posture of the tongue and the lateral expansion are maintained, 4. the articulatory muscles experience a fairly great tension. In the articulation of the non-emphatic sequence ta:b the tongue is flat (not concave) in the mouth and is laterally contracted along its length. Its front is raised towards the upper teeth and the alveolar ridge with comparatively little tension of the articulatory muscles.
النظرية الصوتية للعالم فيث

بشار الرشدان

ملخص

يعرض هذا البحث جوانب هامة من النظرية الصوتية التي وضعها J.R. Firth زعيم المدرسة اللغوية البريطانية في القرن العشرين.

لقد قدم Firth وزملاؤه في جامعة لندن، وجامعات بريطانية أخرى نماذج للنظرية الصوتية المنوية إلى Firth ورملاته. كما قدم عدد من الدارسين الذين تلمذوا على يدي Firth وغيره ممن يتنسبون إلى هذه المدرسة نماذج جزئية لدراسات صوتية طبقت على لغات غير الإنجليزية، منها اللغة العربية.

تتميز النظرية الصوتية الإنجليزية التي وضعها Firth عن المدرسة البنيوية الأمريكية بأنها لا تعامل مع وحدة الصوت المعروف ب Phoneme بل تنظر إلى المقاطع والكلمات والعبارات والجمل من حيث صفاتها الصوتية على أنها تتكون من مستويين صوتيين سماهما Phonological features وعبر عنها بمظاهر صوتية prospects (1) وعبر عنها ب Phonemic Units (2)

ويتم على أكثر من صوت واحد في غالب الأحيان ومنها ما يحصل للأصوات عند النفاه الكلمات .

References


(Quoted in Sommerstein).


المراجع العربية:

إبراهيم أنيس، الأصوات العربية، مكتبة نهضة مصر بالفجالة.