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Secondary Emphatics in English and Arabic

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Abstract

By making use of spectrographic analyses and the theory of Grounded Phonology, this study has shown that there is secondary emphasis in the English. The spectrographic analyses have shown that the consonants t, d, δ, **s** and **z** become t̲, d̲, δ̲, **s̲** and **z̲** when they are preceded by a low back vowel. This change in these consonants is shown in the spectrographic analyses by a raise in the first formant and a lowering of the second formant leading to their being close to each other. This change in formant formation is not only the result of the low back vowel following these consonants but also reflects the formant formation of the consonants themselves, as explained by Ladefoged (1982).

This formant formation characteristic of this language phenomenon in English can also be accounted for by the theory of Grounded Phonology. It involves a feature spreading rule, whereby the t, d, δ, **s**, and **z** consonants acquire the feature [-ATR] making them less advanced in tongue root position. This slight retraction in the tongue root position leads to their being produced as t̲, d̲, δ̲, and s̲. This spread of the feature [-ATR] to these consonants is because of the low back vowel that follows them.

Thus, this language phenomenon called secondary emphasis in English is nonetheless different from its counterpart in Arabic. In Arabic, the spread is from a

consonant of primary emphasis to an adjacent vowel, leading to a change in the vowel quality from [+high] to [-high] and [-ATR]. In English, this secondary emphasis is from a [+low] vowel (with the feature [-ATR]) to a [+high] consonant, making it acquire the feature [-ATR]. Since this type of spread is from a vowel to a consonant, it does not involve changing the consonants. This harmony simply makes the production of these consonants less high and involving some retraction of the tongue root. It simply adds the feature [-ATR] to these [+high] consonants.

This feature change in their articulation is mirrored acoustically by the slight raising in the first formant and lowering of the second formant at the onset of the syllable; whereby we have the production of consonants with secondary emphasis.

1: Introduction

John McCarthy (1991) says that gutturals represent a natural class. By a natural class, he means that "gutturals are universal rather than inherited from proto-Semitic." (65) Likewise, Peter Ladefoged (1982) says that pharyngealization may be considered as the superimposition of the vowel quality which is the lowest, most back vowel. Along these lines, I hope to draw attention in this article to the fact that the English language may be said to have the phenomenon of secondary emphasis. This phenomenon of secondary as well as primary emphasis has always been associated with the Arabic Language. But whereas the Arabic Language has primary emphatic sounds which in turn lead to the presence of secondary emphatic sounds; in English there is only secondary emphatic sounds which have come about as result of a harmonic process associated with its low back vowel. I wish to give a twofold explanation of this

harmonic process in English: (i) spectrographic analyses of this harmonic process, (ii) an analysis of this harmonic process in accordance with the modular theory of Grounded Phonology by Diana Archangeli and Douglas Puueyblank.(1994). As Ladefoged (1982) himself says that " reading spectrograms [is] more an art than a pure science, " (179) it has been found that it is necessary to complement the findings made on the basis of spectrographic analyses by making use of the theory of Grounded Phonology. Accordingly, section one of this paper introduces the subject; section two gives a review of the literature related to the phenomenon of secondary emphasis; section three gives the data under discussion and their spectrographic analyses; and section four first gives a brief discussion of the theory of Grounded Phonology and then analyzes the data under discussion in the light of this theory of phonology.

II: Review of the Literature:

This phenomenon called secondary emphatic sounds has been thoroughly discussed as regards the Arabic language because of the presence of primary emphatic sounds, which are even indicated in the orthography of the language. In English, on the other hand, there are no primary emphatic sounds; and no one – to my knowledge – has discussed this phenomenon of secondary emphatic sounds. However, as this phenomenon of secondary emphatic sounds in the English language is related to its vowel system, let us first have a look at what P. Ladefoged (1982) says as regards the vowels in spectrographic analyses.

P. Ladefoged (1982) describes "a spectrograph as" a device that translates a sound into a visual representation of its component frequencies." (177) In the analysis of

vowels, Ladefoged (1982) says that " a vowel sound contains a number of different pitches simultaneously:" "there is the pitch at which it is actually spoken, and there are the various overtone pitches that give it its distinctive quality." (174) In order to "distinguish one vowel from another", he goes on to say that this is done "by the differences in the overtones that are audible " (174) and that those characteristic overtones are called the formants of the vowels. The lower of the two formants is called the first formant and the higher the second formant. He says that there is another characteristic overtone, the third formant, but there is no simple way of demonstrating its pitch.

He points out that "the first formant frequency increases as a speaker moves from the high vowel in '*heed'* to the low vowel in *'had'* and that it decreases as the speaker goes from the low vowel in '*hod*' to a high in '*who'd.* '" In other words, the first formant is inversely related to vowel height and the second formant frequency decreases as a speaker goes from the front vowel in 'heed' to the back vowel in 'who'd'. But he points out that the correlation between the second formant frequency and the degree of backness of a vowel is not as good as that between the first formant frequency and the vowel height. He also points out that "there is a better correlation between the degree of backness and the distance between the first two formants, which are far apart in front vowels and close together in back vowels." (179) This in turn makes him say that "height is more closely determined by the first formant frequency than by the height of the tongue." (180)

As for consonants, he says that "in many cases a consonant can only be said to be a particular *way* of the beginning or ending a vowel." (182) Focusing on the stop

sounds, he says that "each of the stop sounds conveys its quality by its effect on the adjacent vowel." (182) This is because "the actual point of origin of the formants will depend on adjacent vowels. "(182) In other words, "the position of that part of the tongue that is not involved in the formation of a consonant closure will be largely that of the adjacent vowel. "(182) This is actually the case as regards the data under discussion in this study in that the adjacent vowels affect the pronunciation of the consonants preceding them. Ladefoged (1982) goes on to say that "the formant frequencies at the moment of release will be determined by the shape of the vocal tract as a whole, and hence will vary according to the vowel." (182) Citing the example of *"gag"*, Ladefoged says that "the most noticeable feature is the narrowing of the distance between the second and third formants. "(183) He says at the end of the word it is almost as if the second and third formants went toward a common point. He continues saying that "this coming together of the second and third formants is very characteristic of velar consonants." (183) Ending this very brief discussion, it should be pointed out that Ladefoged (1982) says that "it is also characteristic of velars that the formant transitions take longer than in the corresponding alveolar or bilabial sounds." (183)

Of great importance to this study is Ladefoged 's (1982) assumption that "the frequencies of the first two formants determine the vowel height and backness." (207) Ladefoged 's (1982) definition of the -- /ɑ/ -- vowel as the lowest, most back possible vowel without producing pharyngeal friction is of importance to this study. He also defines pharyngealization and velarization. He says that velarization involves the "raising the back of the tongue;" (211) and in describing pharyngealization, he says that it "is the superimposition of the narrowing of the pharynx."

(211). It is interesting to note that he also says that " the cardinal vowel (5) may be considered as the superimposition of this vowel quality."(211) In ending this discussion of Ladefoged (1982), it should also be mentioned that he has said that "there is some similarity in quality between retroflex stops and velarized or pharyngealized stops in that in "all these sounds the front of the tongue is somewhat hollowed." (211)

As mentioned earlier, John McCarthy (1991) says that "gutturals are universal rather than inherited from proto-Semitic." (65) John McCarthy (1991) gives a detailed description of gutturals, saying that the full set of gutturals reconstructed from proto-Semitic are laryngeal /?/ and /h/; pharyngeal / ḥ / and /ʕ/ ; and uvular /χ / and /γ. Even though he basically concentrates on gutturals, he gives very valuable information as regards emphatics in general. Whereas John McCarthy's (1991) defines gutturals as sounds that "are produced with primary constriction in the posterior regions of the vocal tract;" (64) emphatic sounds are defined as those that "are produced by a primary constriction anywhere in the entire region that encompasses the larynx through the oropharynx." (64) He goes on to say that the proposal he is making "is not unlike the earliest classification of those sounds by the Arab grammarian Sibawaihi. He says that Sibawaihi defines all gutturals as "throat consonants": the laryngeals are produced at "the back of the throat"; the pharyngeals are produced at " the middle of the throat"; and the uvulars are produced at "the part of the throat nearest the tongue". (64) and (65) He also says that "the main gesture in the production of the pharyngeals is the approximation of the posterior wall of the laryngopharynx and the tongue root from the epiglottis down to the pharynx; "(79) i.e. both the posterior wall of the laryngopharynx and the tongue root

are moved from their rest positions; and "as a mechanical consequence of these moves, the larynx itself and adjoining structures are raised considerably."(79)

McCarthy's (1991) discussion of gutturals is important to us in that the examples he cites not only "show that the gutturals are treated as a natural class in conditioning rules of vowel lowering" *(72)* but also demonstrate the harmony between vowels and consonants. McCarthy (1991) says that "the a/a class is derived from both a/u and a/i; that is, the vowel of the impefective is lowered under adjacency to a gutteral. The evidence for this is that the a/u and a/i Ablaut patterns never occur with gutteral roots." (70) "This rule is additionally subject to morphological conditioning. It affects only the vowels of the a/i and a/u Ablaut classes; but does not affect the u/u class... nor the *i* perfective of the perfective passive; nor any other vowels in the language." (70).

In describing laryngeals acoustically, McCarthy (1991) says that the laryngeals are characterized by a complete lack of formant transition or other effects on adjacent vowels. That is, in the production of /?/ and /h/ McCarthy (1991) says that "there could be no pharyngeal or uvular constriction accompanying the glottal gesture" even though "raising of the larynx during production of the consonant (an effect seen conspicuously with pharyngeals) would produce a falling transition of the second formant in a following vowel as the larynx returns to its normal position." (78) In describing the pharyngeals / h / and /ç/ acoustically, McCarthy (1991) says that the consonant/vowel boundary of /ç/ has a F_2 that is relatively low, in the 1200-1400 H_z range and a F_1, which is high – 900- 1000 H_z. The acoustic description of /h / is roughly the same, although F_1 is not quite as high.

As regards the uvular /χ / and /γ/, McCarthy (1991) says that " the uvulars are produced with a much higher and slightly narrower constriction than the pharyngeals". (80) To obtain this constriction, the dorsum of the tongue is bunched and retracted toward the posterior wall of the oropharynx. The dorsum is also raised. (80) "Acoustically, /χ / is characterized by fricative noise at a very low frequency, below 1200 H_z. /γ/, on the other hand, shows formants at 500-600 H_z and 1200-1300 H_z ; i.e." F_1 is not as high as in the pharygeals, but F_2 is as low." (80) McCarthy (1991) maintains that the somewhat lower F_1 of the uvulars compared to the pharyngeals is consistent with the fact that they are produced quite close to the midpoint of the vocal tract." (80) McCarthy (1991) emphasizes that " F_1 is a major cue for identifying uvular / pharyngeal distinction within the gutturals." (80) Therefore, "on the articulatory side, the gutturals are produced by three entirely distinct gestures." (81) The first type (i.e. laryngeals) are purely glottal. The second type (i.e. pharyngeals) involve retraction of the tongue root and epiglottis; and they require advancement of the posterior wall of the laryngopharynx. The third type (i.e. uvulars) involve a superior- posterior movement of the tongue dorsum. However, McCarthy (1991) goes on to say that acoustically "the gutturals do share a relatively high F_1 since all are produced in posterior regions of the vocal tract" and that "this is even true of the larygeals /?/ and /h/, which lack distinctive resonance properties, since F_1 is normally quite low in consonants." (81)

After this detailed articulatory and acoustic description of gutturals, McCarthy (1991) proposes a feature theory that is not based on the traditional means of classifying consonants by points of articulation, rather "the

natural class of gutturals [should be] defined by their place of articulation, [pharyngeal]." (64) This is because gutturals "do not constitute a natural class within an articulator-based theory of distinctive features " (64) even though "gutturals must constitute a natural class within any adequate distinctive feature theory." (64) McCarthy (1991) says that his proposal differs from the dominant view within phonological theory, which has been that of *SPE* feature system (originally developed by Chomsky & Halle (1968)). The result of latter theory " is an ARTICULATOR-BASED theory of distinctive features, where each speech sound is characterized by the active articulator ...producing it."(McCarthy, 1991: 64) That is, recent phonological research on distinctive features (Halle, 1988, McCarthey, 1988) has developed a model that places very rigid restrictions on reference to 'place of articulation' in the consonant systems, making the major classification of speech sounds on the basis of the active articulator that produces them. The fruit of this work is a set of three features that refer to the active articulator. The first refers to [labial] sounds, which are produced by raising or protruding the lower lip and possibly the upper one as well. The [labial] sounds include true labials, labiodentals, and, as a secondary articulation, lip-rounding. The [coronal] sounds are the dentals, alveolars, palato-alveolars, and retroflexes. The [dorsal] sounds are made by moving the tongue body from its neutral position; and these sounds include the vowels, the palatals, velars, and perhaps uvulars, and, as a secondary articulation, verlarization. McCarthy (1991) goes on to point out that "the [dorsal] articulator will only characterize the uvulars, since of all the gutturals only the uvulars are produced by the tongue body". (83) On the other hand, "pharyngeals require a new active articulator ([tongue root], perhaps); and the

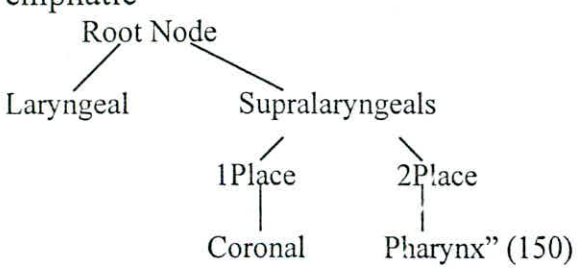
laryngeals involve gestures of the larynx that are not described by articulator features at all." (83) Thus, McCarthy (1991) manages to show that the earlier model "fails to account for the fact that gutturals are a natural class even if there is the addition of [tongue root] and some new feature [laryngeal] to the set of articulator features.

Maintaining that "gutturals are produced by three entirely distinct active articulators" (83) and that the defining characteristic of the gutturals is not the major articulator but the place of articulation, McCarthey (1991) says that "all gutturals are produced by a constriction in the same region of the vocal tract " (83) and attempts to give a detailed description of this region. He defines this region as "the area from the larynx inclusively to the oropharynx." (83) Since "three different articulators have access to that region--- the larynx, the tongue root and epiglottis, and the tongue body," (83) "distinctive features are defined as particular patterns of feedback from the vocal tract with consistent acoustic consequences." (McCarthey,1991:85) Accordingly, McCarthey 1991) proposes that feature [pharyngeal] be defined as "the orosensory pattern of constriction anywhere in the broad region of the pharynx. "(85) And in discussing evidence of the difference in sensory acuity in the vocal tract, McCarthey (1991) shows that sensory neurons in the vocal tract reveal that discriminations are most acute in the anterior mucosal surfaces of the mouth. "The large [pharyngeal] region should be poorly differentiated compared to the smaller [labial] [coronal] and [dorsal] regions " (85) and there is a "relative lack of pharyngeal sensory differentiation." (86) The tongue tip, on the other hand, is unusually sensitive. To end this very detailed description of gutturals, McCarthey 1991) says that "the 'distinctive sound producing state' of [pharyngeal] is high F_1," (85) which is a

property that gutturals share and serves to differentiate among them.

Stuart Davis (1993) says that "most Arabic dialects are characterized by a group of pharyngealized coronal consonants traditionally called emphatics;" (149) and he wonders which distinctive feature characterizes the emphatic phonemes. He says that "Jakobson (1957) used the feature [+flat] to characterize emphatics; while Card (1983) proposed the feature [+F2 Drop]", (150) both features of which "capture the lowering of the second formant that is characteristic of emphatics." (150) It is to be noted that this is reminiscent of Ladefoged's (1982) description of the low back vowels. Stuart Davis (1993) goes on to say that in terms of articuatorily based feature systems, Chomsky & Halle (1968) use the feature complex [+low, +back] to characterize the emphatics; while Hoberman (1989) uses the feature [+ constricted pharynx]. Van der Hulst & Smith (1982) use the feature [+emphasis]; while Heath (1987) uses the feature [+pharygealization]. Stuart Davis (1993) also shows that within the emerging theory of feature geometry as exemplified in the work of McCarthy (1991), Trigo (1991), and Herzallah (1990) an emphatic consonant has the representation in 2.1., with coronal being the primary place of articulation and the pharynx being a secondary place of articulation.

2.1. Possible feature geometric representation of an emphatic



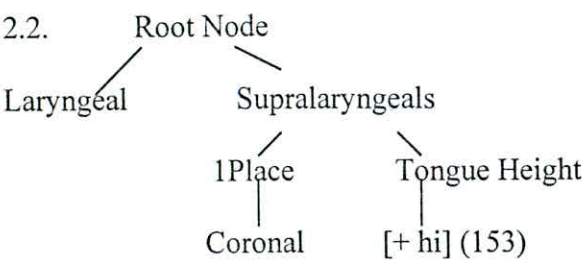
In 2.1, it is the presence of the secondary place node Pharynx that characterizes emphatic phonemes with the terms 1Place and 2Place standing for primary place of articulation and secondary place of articulation, respectively.

Assuming that "all of these feature proposals are adequate in characterizing emphatics given their acoustic and articulatory nature" (150), Stuart Davis (1993) presents phonological evidence from "the spread of emphasis or pharyngealization in a dialect of Palestinian Arabic that supports a view that [retracted tongue root] ...[+RTR] is the relvant feature that characterizes the emphatic phonemes; " (150) i.e."the underlying feature for emphatics. "(150) Maintaining that "in virtually all Arabic dialects when an emphatic occurs in a word neighboring sounds also become pharygealized," (151) he points to the fact that "dialects vary greatly as to the extent to which neighboring sounds become pharygealized.." (151) Stuart Davis (1993) cites Cairene Arabic as an example (Younes (1993)), in which "if there is an emphatic consonant in the word then the entire word is usually pronounced completely pharyngealized." (Stuart Davis, 1993:151) Concentrating on Palestinian Arabic, Stuart Davis (1993) shows that "regressive spreading of pharygealization starts from the emphatic coronal consonant and extends to the beginning of the word" (152) with no phoneme blocking this type of spread. As for progressive spread of emphasis, he says that it spreads from the emphatic coronal consonant to the end of the word; but it is blocked by the phonemes /i/, /y/, /ʂ/, /ʃ /, all of which are [+high].

In his analysis of Palestinian Arabic, Stuart Davis (1993) makes use of Pulleyblank (1989) and Archangeli & Pulleyblank (1991), who suggest that often when

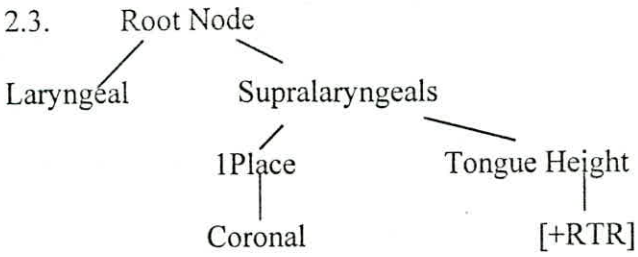
phonemes are opaque to a spreading process, they are characterized by a feature that is incompatible or anatagonistic with the spreading feature, Stuart Davis (1993) says that the phonemes /i/, /y/, /š/, /ʃ / act as a natural class "in that they are opaque to the progressive spreading of pharygealization." (153) These opaque sounds are all coronals and can all be considered as [+high]" (153), as shown by the representation in 2.2.

2.2.

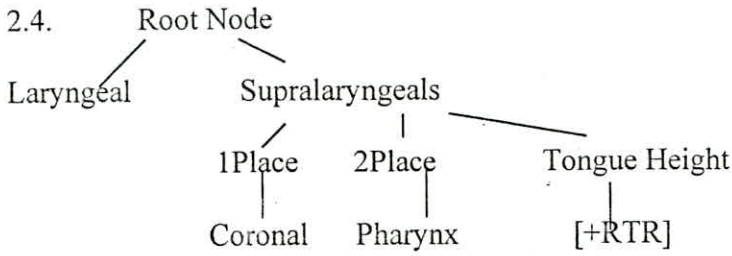


He says that there is "a feature cooccurrence restriction that "prevents any phoneme that is [+high] from also being realized with the emphatic feature [+RTR]." (154) This feature cooccurrence restriction is "If [+high], then not [+RTR]." (154) This feature cooccurrence restriction is because "the feature [+high] is incompatible with the feature [+RTR]." (154) In other words, "the feature [+high] is opaque to [+RTR] spreading;" (154) Stuart Davis (1993) differs in this respect from McCarthy (1991), as shown in 2.4.,in that Stuart Davis (1993) "represent[s] emphatics as crucially having the tongue height feature [+RTR] and lacking any pharyngeal component" (154), as shown in 2.3.

2.3.



2.4.



However, in spite of the fact that Stuart Davis (1993) argues that emphatic sounds in Palestinian Arabic have a "[+RTR], a tongue height feature and not a pharyngeal feature," (158), he nonetheless still maintains that by "retracting the tongue to produce an emphatic, the pharynx also becomes constricted...Phonetically ,... emphatics are pharyngeals." (158) Accordingly, Stuart Davis (1993) concludes saying that " Progressive Spread involves the spreading of the feature [+RTR], while Regressive Spread involves the spreading of the Pharynx Node" (159) and that "it is only the spread of [+RTR] which is subject to the cooccurrence restrictions with the feature [+high]." (160)

M. Younes (1993) differentiates between primary and secondary emphatics, both types of which are found in the Arabic Language. This distinction is important to us as the English language has only secondary emphatics. Younes (1993) goes on to say that a number of different terms have been employed to refer to this phenomenon. "In addition to 'emphasis', which is the translation of the Arabic term

tafxim, the terms 'verlarization', 'backing', and 'pharyngealization' have been widely used." (216) Describing secondary emphatics as "secondary articulation involving the back of the tongue, which accompanies a primary articulation at another point in the vocal tract", (216) M. Younes (1993) says that the primary emphatics are distinguished from the secondary emphatics in three major respects. First, they contrast with a set of nonemphatic phonemes. Second, emphatic/ nonemphatic contrasts involving primary emphatics are found in all vocalic environments, whereas contrasts involving secondary emphatics are found only next to low vowels. The third characteristic is that, "except for /r/, the secondary emphatics are found in only a handful of forms, mostly borrowings from foreign languages." (217)

He notes that there are significant differences observed in the treatment of the secondary emphatics, with different linguists adding one, two, or more to the list of emphatics phonemes. In other words, in addition to the primary emphatics /t̲ /, /s̲ /, / δ̲ /, /d̲ /, and /z̲ / and a number of other consonants generally referred to as secondary emphatics have been added by different linguists. He cites Mitchell (1956), who adds only /r̲ / to the list in Egyptian Arabic, Broselow (1976), who adds both /r̲ / and /l̲ /, Harrel (1957), whose list includes /r̲/, /l̲/, /m̲/, /b̲/, and /k̲/. Erwin's (1963) list of emphatics phonemes in Iraqi includes /l̲/, /m̲/, /b̲/, /p̲/ and /f̲/ in addition to the primary emphatics; Cowell's (1964) list includes /r̲/, /l̲/, /m̲/, /b̲/, /ʔ̲ /, and /n̲ / in Syrian; and Blanc's (1953) includes /l̲/, /m̲/, /b̲/, in North Palestinian Arabic.

Younes' (1993) discussion highlights two important points. The first is the indefiniteness of the number of secondary emphatic sounds found in the different dialects

of Arabic as opposed to the definite and specified set of primary emphatics. The second point is that the secondary emphatics are found only next to low vowels. It is this second point that "always raises the question of whether emphatic/ nonemphatic contrasts may be the result of a low vowel" contrast. (230) It is in this respect that Younes (1993) says that "it is possible to argue that secondary emphasis is no more than an association with a low back vowel whose presence in a word is perceived as a signal of emphasis." (230) He illustrates this showing that "a consonant that is adjacent to a low back vowel in a foreign word that is borrowed into Arabic is frequently interpreted as emphatic, and is pronounced and written as such." (230) e.g. /baa̱s / *bus* , /qay̱sar/ *Caesar* , /ba̱taa̱ta̱/ *potatoes* , /bari̱taanya/ *Britain*, /?i̱taalya/ *Italy*

McOmber (1996) goes even further in regarding even the primary emphatic sounds in Arabic as involving a *Pharyngealized Place Assimilation rule,* which is a spreading process that states that "segments pharyngealized with [rtr] move their articulatorey place one step toward the tongue root." (251) He says that "this rule targets lingual segments because the tongue root is triggering an assimilation (or coarticulation per Ladefoged 1982: 52ff, 242) with the rest of the tongue body". (251) McOmber (1996) maintains that "the feature retracted tongue root [rtr] " is used to distinguish pharyngeal, emphatic, and uvular consonants from their respective plain counterparts, " (233) as shown in 2.5.

2.5.

Lab	Int	Den	Pal	Vel	Lar
p b m	θ ð	t d s z	ʃ	k g	h ʔ
	ð̲	t̲ d̲ s̲ z̲		k̲ χ γ	h̲ ç.

Maintaing an "emphasis spreads from consonants onto vowels", (249) McOmber (1996) talkes about "pharyngealized velars" (i.e. /χ / and /ɣ/), and "laryngeal pharyngealization" (i.e. /h̲ / and /ʕ/). McOmber (1996) continues saying that "labials and laryngeals are necessarily excluded: there are no [rtr] labials in MSA, and larygeals are vacuous having no place features at all." (251) The main point to be deduced here is his assumption that pharyngealization whether primary or secondary is simply an *assimilation rule* that spreads the feature [rtr].

Kimary Shahin (1997) points out that there is a basic difference in the acoustics of pharyngealization and uvularization even though they are two components of one general phenomenon." (132) Following McCarthy (1994), Kimary Shahin (1997) describes pharyngealization, acoustically, as being represented by a raised F_1 and "the acoustic correlate of uvularization as a lowered F_2." (133) However, Kimary Shahin (1997) says that "both gutturals and emphatics trigger pharyngealization harmony in Palestinian Arabic. Pharyngealization harmony is tongue-root- retraction harmony, triggered by both postvelar consonants (gutturals and emphatics). She also says that in Palestinian Arabic there is "pharyngealization of vowels with postvelar consonants whether these consonants are pharyngeals or uvular;" (139) Since pharyngealization and uvularization harmonies permit specifications of pharyngeal place on nonpostvelars, the two harmonies may be considered to be two components of one phenomenon: accessing pharyngeal place.

Talking about "the pattern of emphasis spread that varies from dialect to dialect in Arabic, J. C. E. Watson (1999) says that the asymmetrical behavior of emphasis spread in the various dialects of Arabic can be explained on

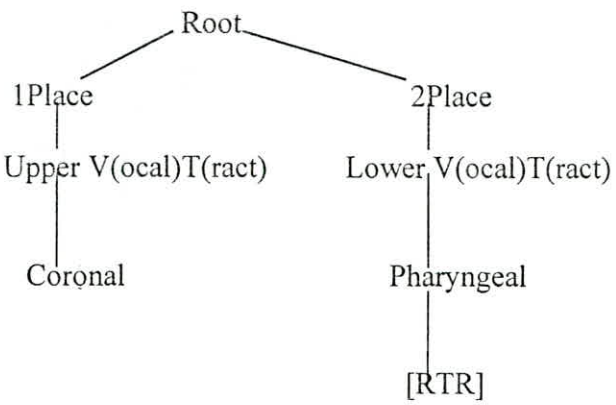
physiological grounds if one takes into account the articulatory phonetics of secondary articulation involved. She goes on to explain that "in pharyngealization, the pharnyx narrows prior to hold phase of the primary articulation. "(294) Thus, "pharyngealization is anchored more on the onset of the primary articulation, which results in the anticipatory nature of the spread of pharyngealization as with velarization . This in turn affects "the formants of preceding segment(s) more than the formants of the following segment(s) (Ladefoged and Maddieson 1996:360-361)". (293) Following Jakobson's (1978:272-273) assumption that there is a tendency to emit pharyngealized phonemes with lip protrusion and slight rounding, J. Watson (1999) says that "in labialization, protrusion of the lips tends to occur on or after the hold phase of the primary articulation." (294) Labialization, accordingly differs in that it 'is typically concentrated on the release phase of the primary articulation that it accompanies' (Ladefoged and Maddieson 1996:357)." (294) As a result the "second formant of a vowel *following* a labialized consonant is lower than the second formant of a vowel *preceding* a labialized consonant (Ladefoged and Maddieson 1996:358)." (294) She, accordingly, concludes that this "suggests that although language-specific factors may dictate the degree to which spread of a given feature in a particular language operates, the actual unmarked directionality of spread of that feature is determined by universal factors." (294) She exemplifies this by the fact that "in Cairene emphasis usually affects the whole phonological word; in Abha (spoken in Saudi Arabia) emphasis rarely spreads beyond the adjacent vowel; [and] in Qatari Arabic emphasis spreads bi-directionally over the whole word." (290)

Stuart. Davis (1995) adopts Grounded Phonology (Archangeli and Pulleyblank 1994) to account for sets of opaque phonemes found in two modern Palestinian dialects of Arabic and for differences in the directionality of emphasis spread. Grounded Phonology views opacity as the result of imposing grounded path conditions on the target of a rule rather than (more traditionally) as a result of specifying opaque segments for the opposite value of the spreading feature. A grounded path condition is taken to be a feature cooccurrence restriction that can be motivated by phonetic criteria. In the two Palestinian dialects of Arabic Davis considers, emphasis spread is bi-directional within the phonological word but exhibits a rightward/leftward asymmetry. The leftward spread (pharyngealization) is generally unbounded within the phonological word, whereas rightward spread is blocked by a set of opaque segments for each dialect. In the southern dialect of Palestinian Arabic left-to-right emphasis is blocked by the [+high, - back] phonemes /i,y,š,ǰ/. In the northern dialect of Palestinian Arabic emphasis spreads leftward from the underlying emphatic consonant to the beginning of the word. Rightward spread is frequently restricted to a following low vowel and is blocked by an intervening high phoneme / š, y, w, i, u /.

Of great importance to us is Stuart Davis' (1995) definition of emphasis. Pharyngeals for him do not just involve a movement of tongue root but also require the part of the pharynx immediately behind the mouth to be laterally compressed, so that the faucal pillars move towards each others with the larynx being somewhat raised at the same time. The feature geometry of the emphatic (pharyngealized coronal) consonants of Arabic that Stuart Davis (1995) proposes is also of great importance to us. It differs from that of Stuart Davis (1993) and McCarthy

(1991). The feature geometry of the emphatic consonants of Arabic that Stuart Davis (1995) proposes is shown in 2.7.

2.7. **The representation of emphatics**



Since for Stuart Davis (1995) " the retracting of the tongue root is an important articulatory component of emphatic consonants in comparison to their nonemphatic counterparts,"(472) it follows that vowels with this feature [RTR] may be regarded as emphatic, as to be shown in our discussion of English.

This complexity of definition of emphasis is reminiscent of Walter Lehn (1963) in his analysis of Cairene Arabic. Walter Lehn (1963) defines emphasis in Cairene Arabic as involving " slight retraction, lateral spreading, and concavity of the tongue and raising of its back (more or less similar to what has been called velarization." (31) He says that emphasis may also involve one or more of the following: (i) "faucal and pharyngeal constriction (pharyngealization);" (31) (ii) "slight protrusion or rounding (labialization)" (31); and (iii) " increased tension of the entire oral and pharyngeal musculature, resulting in the emphasis being noticeably more fortis than plain

segments." (31) But he remarks that " these features are not all equally prominent for all speakers "(31) as regards all consonants and vowels and that it is generally less for women than for men. The first two features " are probably the most consistently prominent for all segments in all environments." (31) He also draws our attention that " the most prominent effects of these features on vowels may be generalized as modification of tongue positions in the direction of low back." (31)

He says that in Cairene Arabic "emphasis never occurs as a feature of one segment only; its minimum span or domain is the sequence CV (but not VC)." (32) He reiterates saying that " within monosyllabic utterance there are no contrasts; the entire syllable is either emphatic or plain throughout." (32) He goes on to say that "since emphasis never occurs as a feature of one segment only, minimally contrastive emphatics and plain single segments do not occur." (33) Therefore, Cairene Arabic " has more emphatic-plain contrasts" (30) than Classical Arabic because emphasis has extended " throughout the consonant and vowel systems" (30) making "all consonants and vowels occur in pairs." (30) Lehn (1963) advocates an analysis in which emphasis is "a constituent on the syllable level." (39) with emphasis as a subordinate constituent since emphasis presupposes a syllable and not vice versa. According to this analysis, "all vowels occur in emphatic-plain pairs"; and "the distribution of emphatic allophones of consonants " is that " the consonant before emphatic V always has an emphatic allophone (before plain V only plain C occurs." (35)

3. A Spectrographic Analysis of Secondary Emphasis in English

Along the lines of the acoustic description of pharyngeals in the literature, let us now see if there are secondary emphatic sounds in English.

3. 1.Description of the Experiment

Five subjects have participated in this experiment: three American subjects and two near native speakers. In order to get a homogenous group, the native American subjects have been selected as not having lived away from the US for very long so that their pronunciation may not have changed in any way. The near native speaking subjects are my father, Dr. M. M. Ghaly and myself.

All subjects have been asked to read out words that target the respective sounds under study and have had their voices recorded by the spectrograph. As there is only one spectrograph in Egypt, the subjects have had to go to the Faculty of Languages and Translation at AL-Azhar University (the men's section). This recording is done under the supervision of a technician who knows how to work the spectrogram.[1] The near native speakers of English have had their voices recorded by the spectrograph in order to compare their speech with those of the native speakers to see if there are any basic differences. The assumption is that the pharyngealization process that takes place is not a language specific feature. It is a universal feature due to the adjacency of these consonants to the low back vowel.

3.2. Description of the Questionnaire

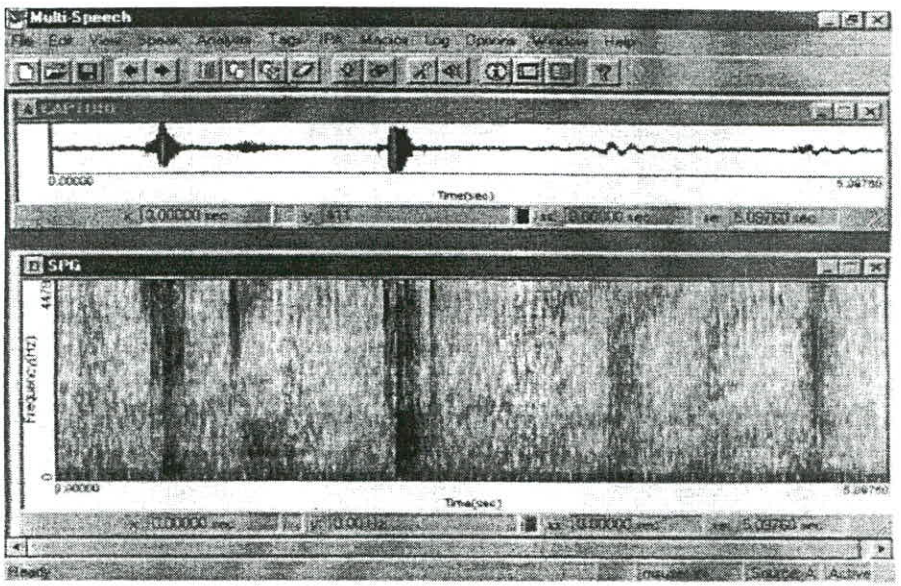
The words that the subjects have been asked to read out are as follows:

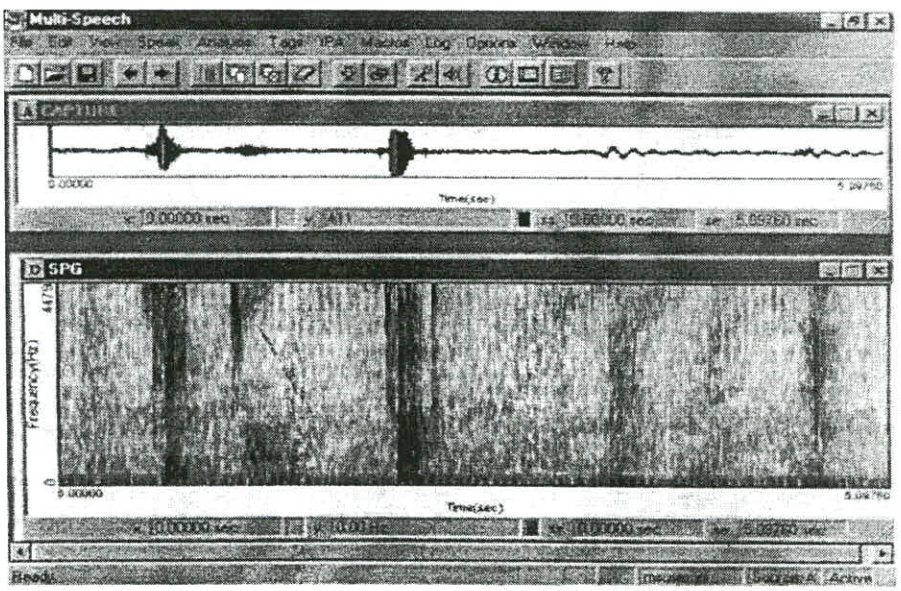
Tim /Tom	Dick/dock	breathe / bother	
tip /top	dean/dawn	see /saw	zizi / zaza
teach /taught			

It is assumed that the **t, d, δ, s** and **z** sounds in **Tim, tip, teach, Dick, dean, breathe, see** and **zizi** become pharyngealized when followed by a low back vowel such as in **Tom, top, taught, dawn, dock bother, saw** and **zaza**; i.e. these sounds, accordingly, become **t̲, d̲, δ̲, s̲,** and **z̲**.

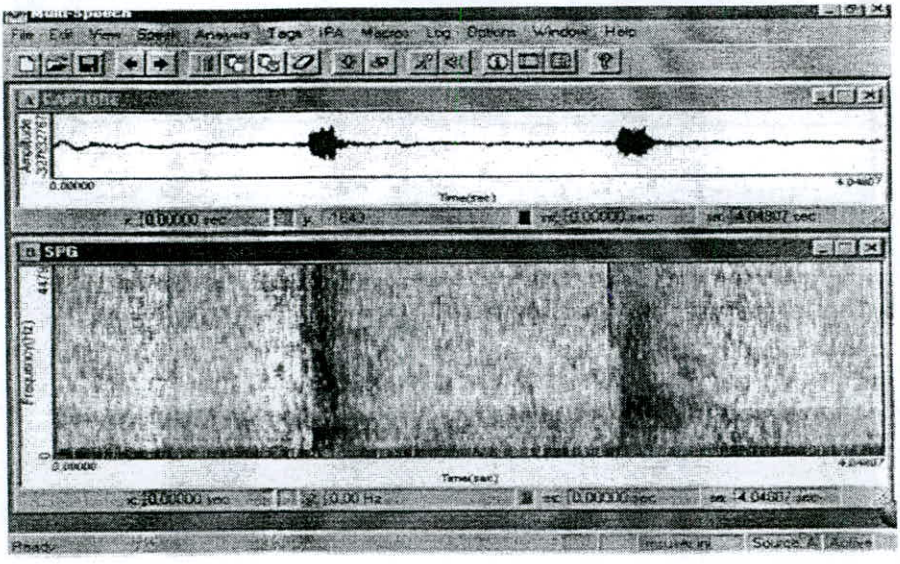
3.3. The Spectrographic Figures

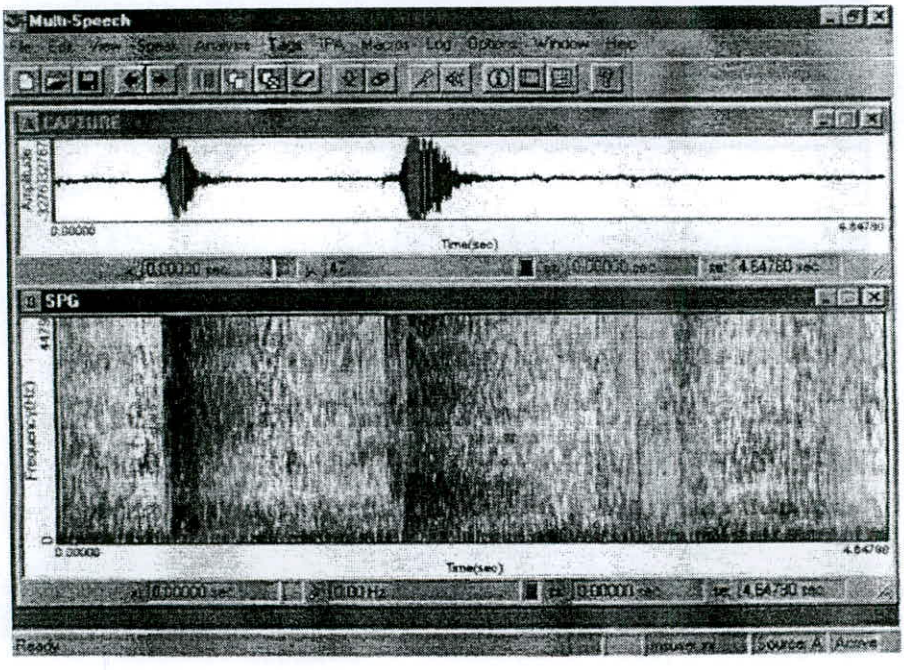
3.3.1. teach taught



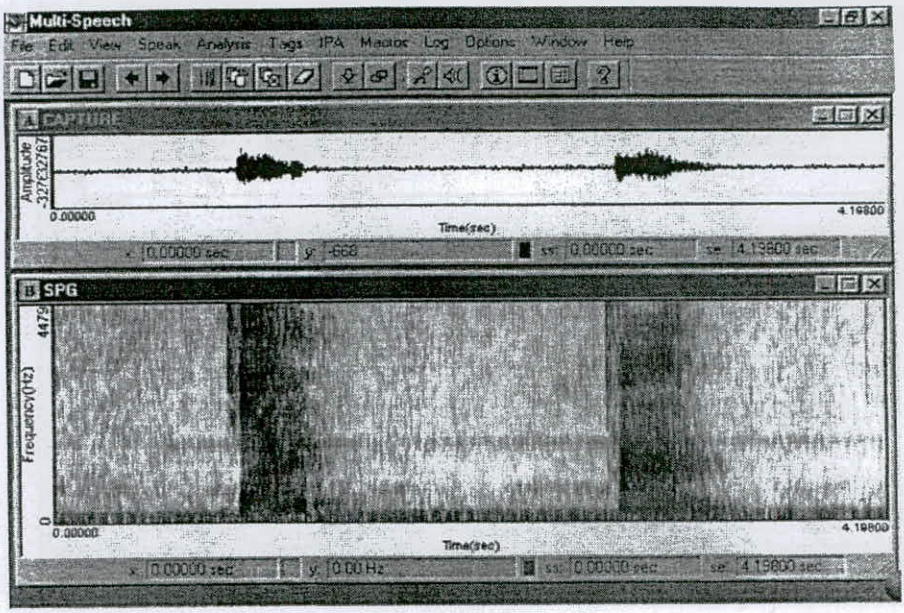


3.3.2: tip top


Multi-Speech
CAPTURE
SPG
Time(sec)
Ready


Multi-Speech
CAPTURE
SPG
Time(sec)
Ready

3.3.3. Tim Tom


Multi-Speech
File Edit View Speak Analysis Tags IPA Macros Log Options Window Help
A CAPTURE
Amplitude
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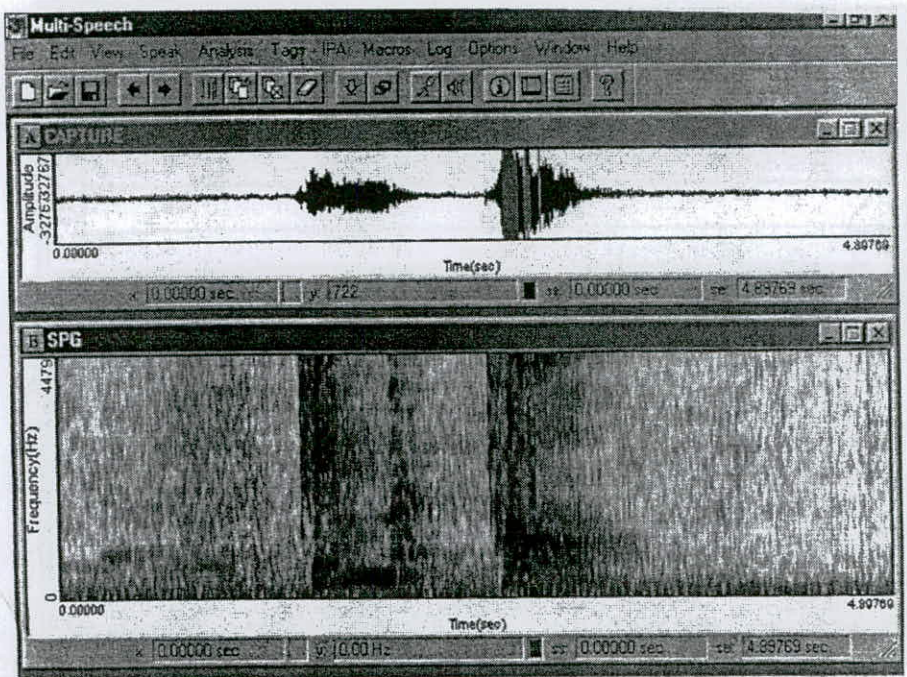
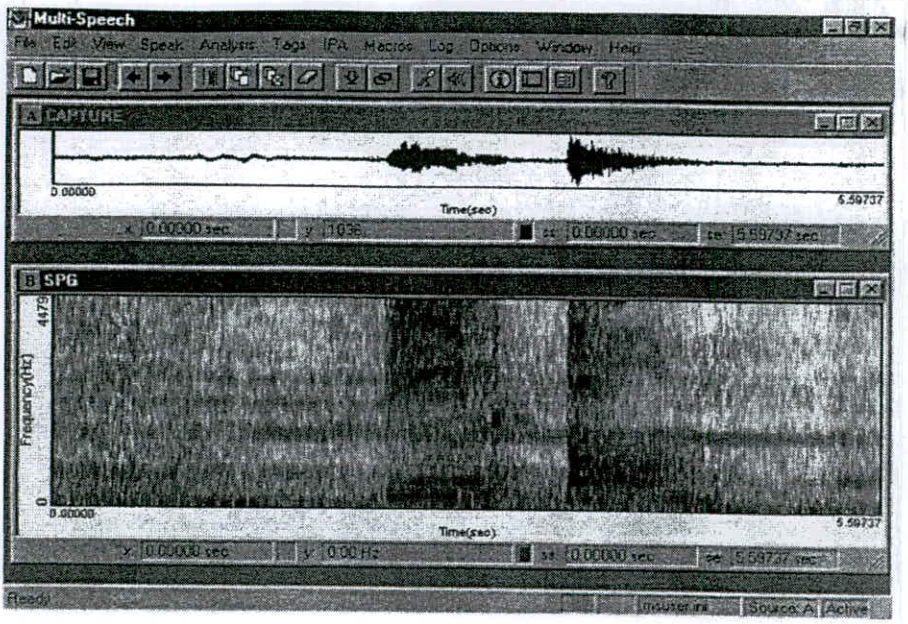
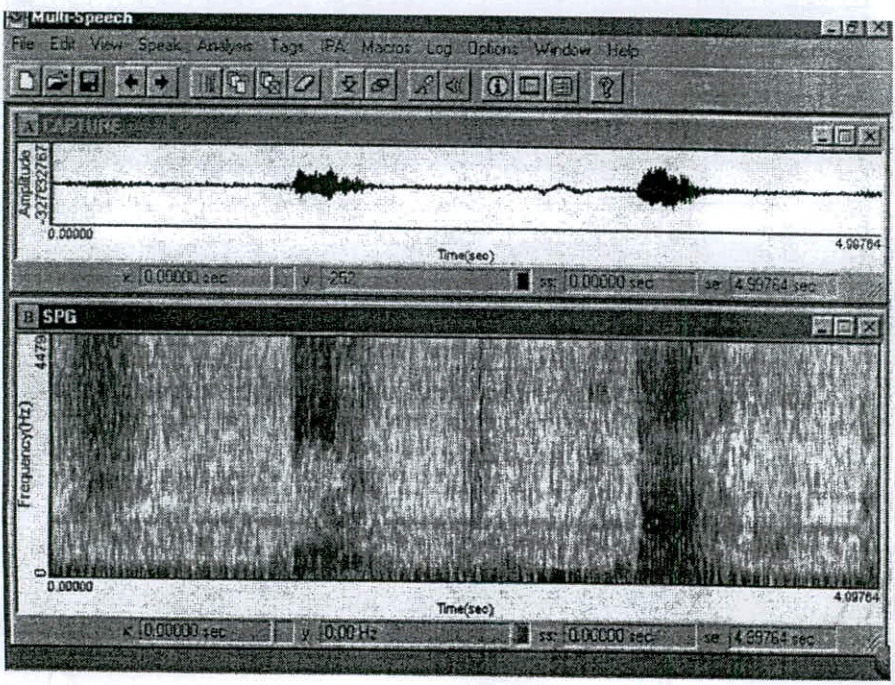
0.00000
4.19800
Time(sec)
B SPG
Frequency(Hz)
4479
0
0.00000
4.19800
Time(sec)

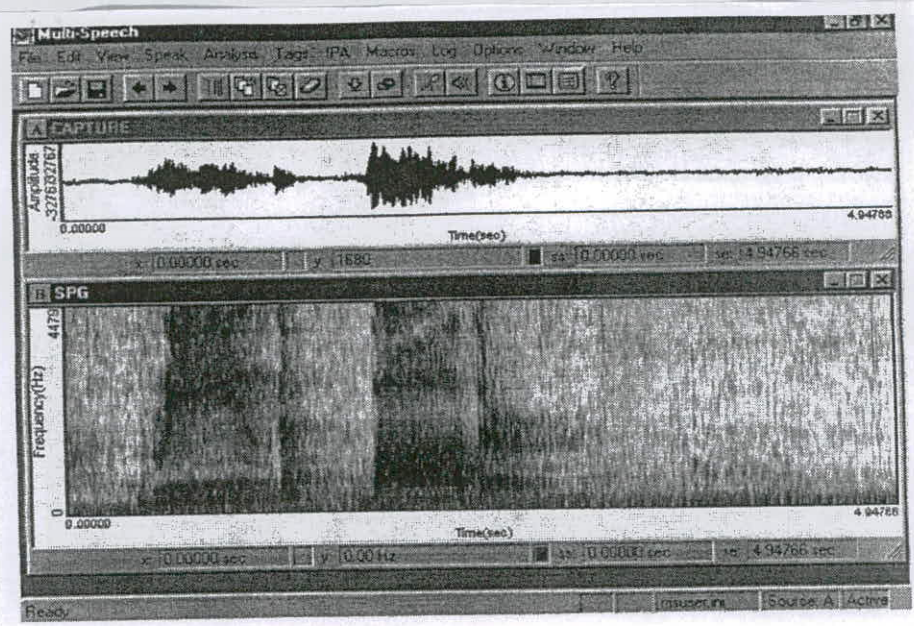

Multi-Speech
File Edit View Speak Analysis Tags IPA Macros Log Options Window Help
A CAPTURE
Amplitude
-32767
32767
0.00000
4.89769
Time(sec)
B SPG
Frequency(Hz)
4479
0
0.00000
4.89769
Time(sec)

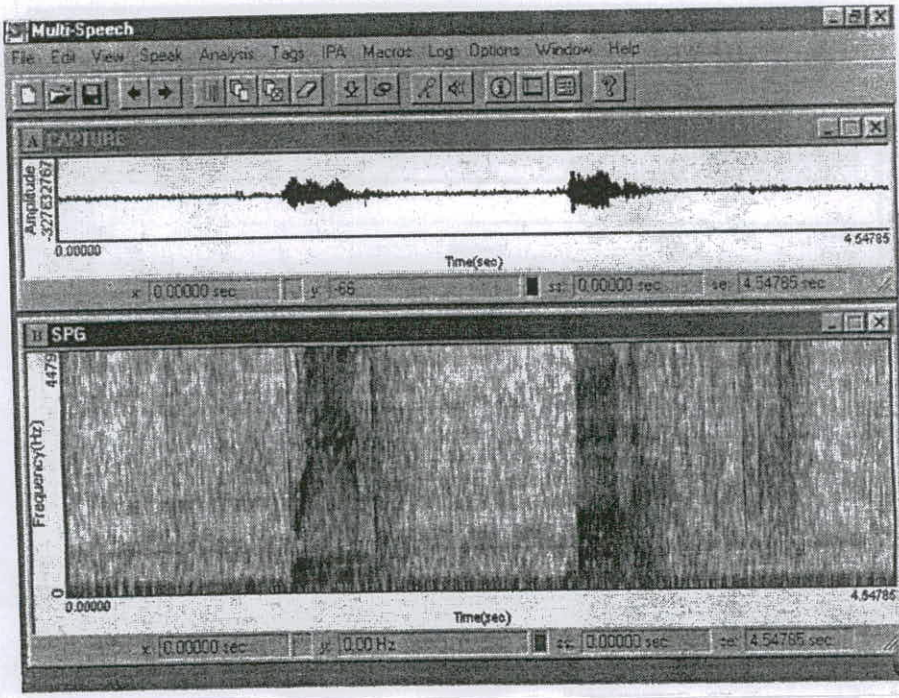
3.3.4. dean dawn



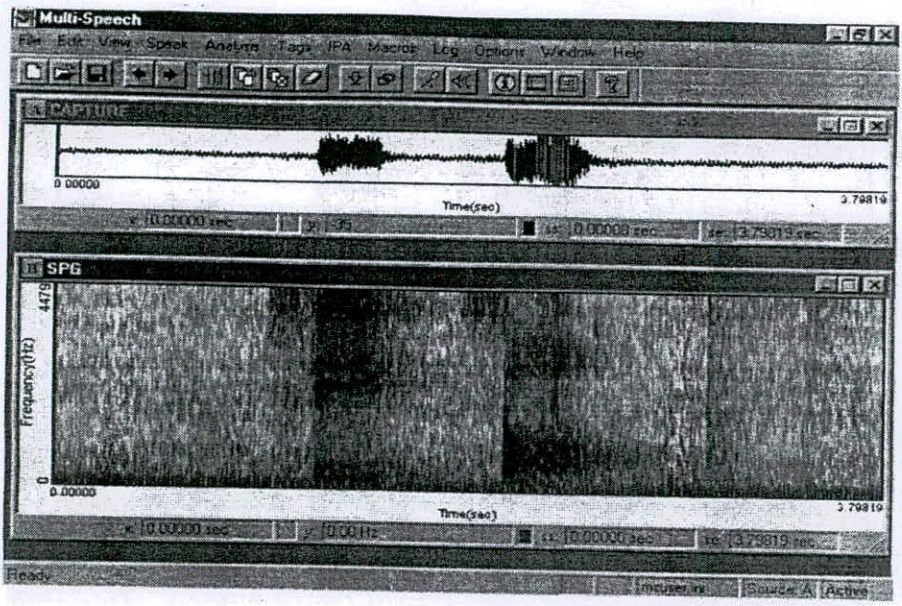


3.3.5. breathe bother





3.4.6. **see** **saw**


Multi-Speech
CAPTURE
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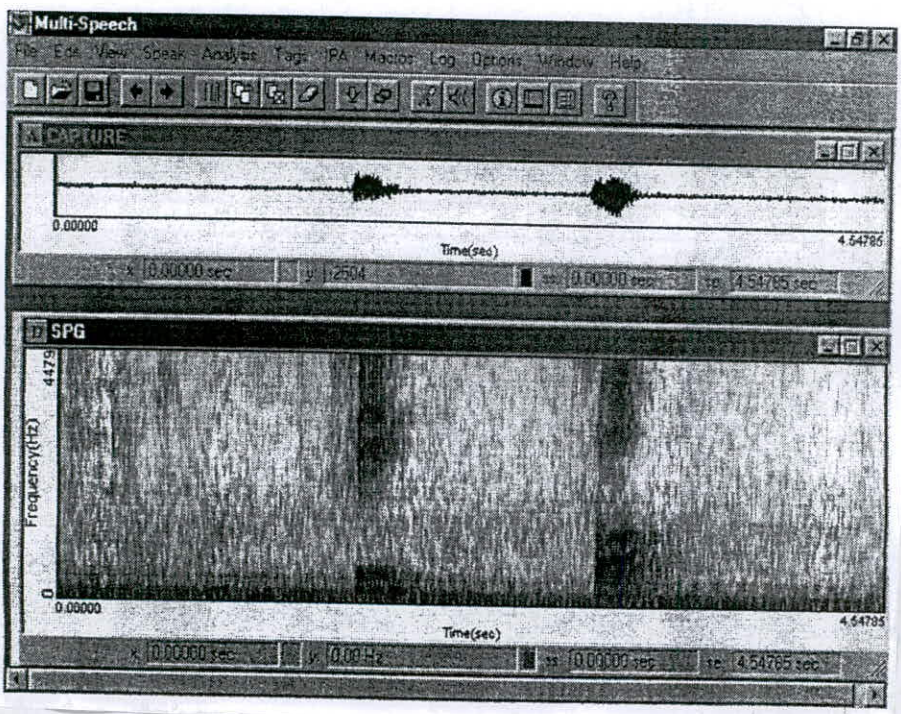
3.79819
SPG
4479
Frequency(Hz)
0
0.00000
Time(sec)
3.79819
Ready


Multi-Speech
CAPTURE
0.00000
Time(sec)
4.54785
SPG
4479
Frequency(Hz)
0
0.00000
Time(sec)
4.54785

3.4. Analysis of the Spectrographic Figures

The spectrographs of **Tim /Tom** show that the first formant in **Tom** is raised and the second formant is lowered making both formants close to one another. In **Tim,** on the other hand, the first formant is not raised; and the second formant is not lowered; consequently, there is a distance between the first and the second formants. This same difference in the formant formation is also found in each of the pairs; i.e. in **tip /top, teach /taught, Dick/dock, dean/dawn, breathe / bother see /saw,** and. **zizi/ zaza**

The above spectrographic analyses are reminiscent of Ladefoged (1982) in that there is "a correlation between the degree of backness and the distance between the first two formants, which are far apart in front vowels and close together in back vowels." (179) These spectrographic analyses also show that in the formation of the adjacent consonant"the position of that part of the tongue that is not involved in the formation of a consonant closure will be largely that of the adjacent vowel. "(182) These spectrographic analyses also verify Ladefoged 's (1982) assumption that the formant frequencies at the moment of release of the consonant will be determined by the shape of the vocal tract as a whole, and hence will vary according to the vowel. Likewise, these spectrographic analyses show in agreement with Lehn (1963) in his discussion of Cairene Arabic that " the consonant before emphatic V always has an emphatic allophone (before plain V only plain C occurs." (35)

The above spectrographic analyses also show that pharyngealization can be explained by physiological

grounds taking into account the articulatory phonetics of secondary articulation in agreement with J. Watson's (1999). Since the pharnyx narrows prior to hold phase of the primary articulation, pharyngealization is anchored more on the onset of the primary articulation; i.e. before the production of the vowels. This is because of the anticipatory nature of the spread of pharyngealization. This is displayed by the fact that the formants of preceding segment are affected more than the formants of the following segment. This similarity of the emphatic spread in English to that of Arabic, as shown in J. Watson (1999), demonstrates that the actual unmarked directionality of the emphatic spread is determined by universal factors. This universality is also shown by the fact that there are no differences between the pronunciation of the American native speakers and the near native speakers in this respect.

4. An Analysis of Secondary Emphasis in English in terms of Grounded Phonology

4.1. A brief survey of Grounded Phonology

Diana Archangeli and Douglas Puueyblank (1994) advocate a modular phonological theory which "determines the extent to which representations and processes are regulated by constraints of universal nature, and the extent to which each is open to language-specific variation." (3) "The modular approach to such variation involves the interaction of the phonological component with the morphological and syntactic components of the grammar; " (5) i.e. systems differ cross-linguistically with respect to the morphological or syntactic domain within which harmony is applicable in that in some cases, harmony may

apply between a root and suffixes, in others, between a root and prefixes.

In addition to morphosyntactic limitations, Diana Archangeli, and Douglas Pulleyblank (1994) adopt the view that features or F-elements are phonological primitives. This enables them to develop a theory of underlyingly feature specifications which they call Combinational Specifications. The particular F-elements that are considered relevant or active are language specific. Combinational Specifications allows for the possibility that if two languages have identical vowel inventory, a different set of features may nonetheless be active in each language. In the representation of morphemes within a Combinational Specifications framework, either the F-elements may be underlyingly linked to some Root node or they may be free (floating). During the course of a derivation F-elements may combine. A free element may link by rule to a Root node that already contains linked F-elements, or a linked F-element may spread to other Root nodes already containing F-elements.

Neutral elements do not undergo harmony. In many cases, the neutral element is *transparent*; in others; the neutral element is *opaque*. Transparent elements are ignored by the harmony processes; i.e. "harmony proceeds right across the transparent elements and has no perceptible effect on them" (7) in the sense that [ATR] values spread from vowel to vowel regardless of the number or nature of intervening consonants when all intervening consonants are transparent Neutral elements may also be *opaque*, preventing the harmonic process from propagating over them failing to undergo the harmonic process themselves. "The general claim is that natural language grammars impose only a very narrowly constrained set of

phonological rules, rules derived from the interaction of the four formal parameters with conditions determined by other phonological modules and principles." (10) That is, depending on the environment, harmony may apply strictly from left to right, strictly from right to left, or bidirectionally. Harmony may extend from a triggering vowel to an unlimited number of targets within the relevant domain; conversely, harmony may only apply to a vowel immediately abutting the harmonic source. To account for this class of diversity, Diana Archangeli, and Douglas Pulleyblank (1994) argue that rule theory allows the limited set of formal parameters of *Function, Type, Direction, Iteration.*

When F-elements combine, they are subject to path conditions. A path condition is essentially a feature cooccuuence restriction that is motivated on phonetic criteria. Such a path condition is referred to as a grounded condition. These path conditions are formalized in terms of implicational statements that have both positive and negative features. Diana Archangeli and Douglas Pulleyblank (1994) show that there are grounded path conditions on the features [ATR] and [low] and on the features [RTR] and [high], as shown in 4.1.1.

4.1.1. (i) *ATR/LO*
If [+ATR] then [-low]
If [+ATR] then not [+low]
(ii)*RTR/HI*
If [-ATR] then [-high]
If [-ATR] then not [+high]

These path conditions are regarded by Diana Archangeli and Douglas Pulleyblank (1994) as

phonetically grounded because the tongue root advancement that is required by [+ATR] is antagonistic with the low tongue body position that is required for the [+low] feature. Likewise, the tongue root retraction required for [-ATR] is antagonistic with the high tongue body position that is required for the [+high] feature. On the other hand, the relationship between [+ATR] and [+high] or between [-ATR] and [+low] is regarded as an instance of a sympathetic feature relation because these features are compatible. Sympathetic feature relations often play important roles in the phonology of languages; and they are referred to by rules of insertion or spreading.

Apart from the strong path conditions in 4.1.1., there are also weaker conditions, which are neither as strongly motivated in terms of phonetics nor as phonologically common cross-linguistically. The absolute predications are made by Grounding Condition I; but "Grounding Condition II makes predications about cross-linguistic and intralinguistic tendencies." (178) An example of this latter type of condition is shown in 4.1.2.

4.1.2.*FR/ATR*

If [-back] then [+ATR]

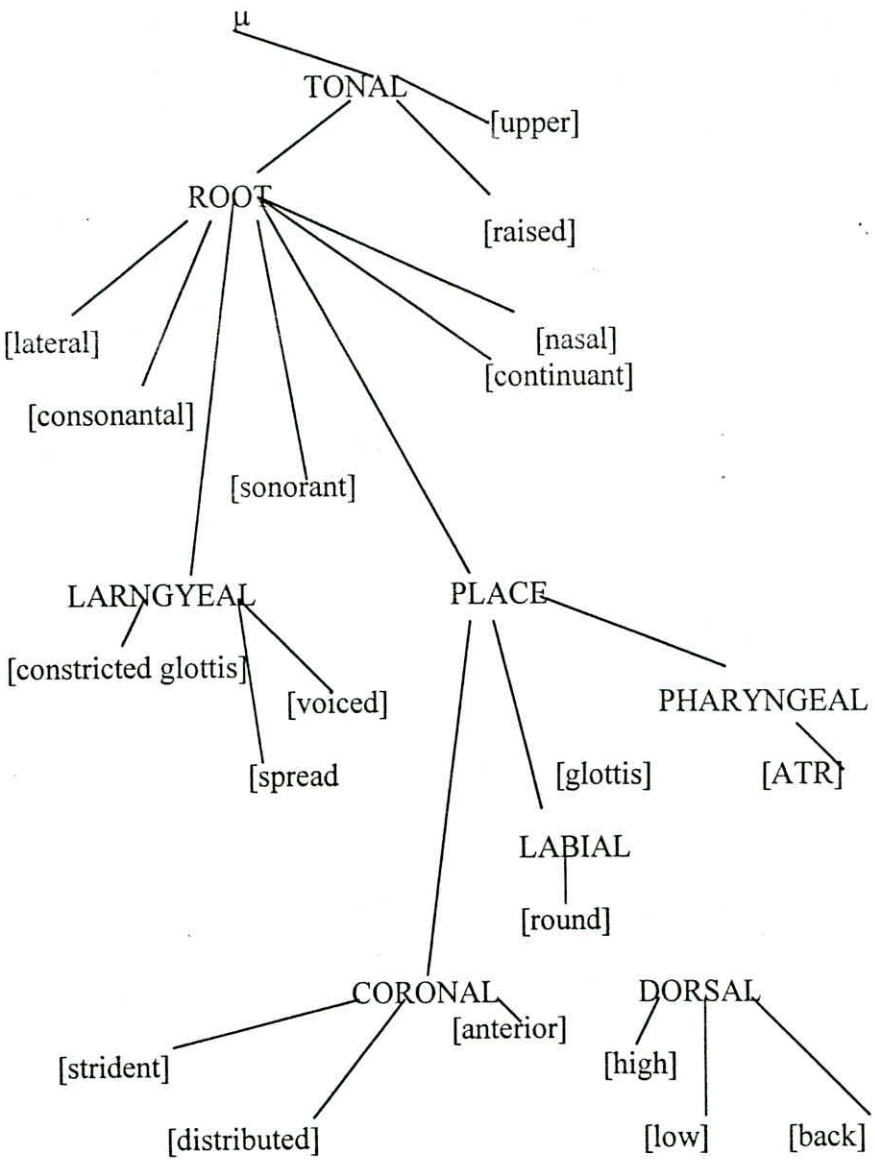
If [-back] then not [-ATR]

This grounded path condition states that the articulation of a [front] ([-back]) position of the tongue body is antagonistic to the retraction of the tongue root. Only grounded path conditions (whether expressing antagonistic or sympathetic feature relations) can be invoked by natural languages. That is, these implicational relations are *grounded in their phonetic correlates* (articulatory and acoustic) and where these implicational relations do not hold of representations as a whole, they

may still play a role in restricting the application of specific rules. This introduces "a theory of Feature Markedness; the interaction of Feature Markedness with the Grounding Conditions accounts for a variety of patterns attested cross-linguistically."(15)

Diana Archangeli and Douglas Puueyblank.(1994) are basically following Clements (1985a) in expressing feature sets by a hierarachically organized tree structure in which *Nodes* "identify sets of features that can function in a phonologically unified fashion."(19) "The Place node is defined by articulator nodes." (19) Diana Archangeli and Douglas Puueyblank (1994) propose a feature geometry as shown in 4.1.3.

4.1.3.



In discussing " the association of features: node generation" (21), Diana Archangeli and Douglas Puueyblank (1994) say that "each feature appears on its own tier" and that "the relation of association may hold

between nodes and features, other nodes, and/or prosodic structure." (21) They go to say that "the domain *path* extends over a particular type of such associations." (21) Features like [± ATR] and [± continuant] are binary. But class nodes such as Labial, Coronal, Dorsal, and Pharyngeal, however, have no negative counterpart. They " are associated with definable phonetic content." (21) A path is informally defined as "any set of associated nodes, features, or prosodic categories such that no more than one token of any node, feature, or prosodic category is included in the set." (21) "Not all nodes and not all features need to be present in the presentation of any single sound." (22) If a segment involves a daughter feature, the segment involves the dominating feature." (45)

"The conclusion to be drawn is that neither underlying representations nor surface representations consist of discrete ordered sets of consonant and vowel segments." (46) "One might simply define 'segment' as being, e.g., 'the set of feature values dominated by a single Root node'". (46) In other words, they "argue for reference to the primitive notions of features and associations, directly deriving lexical formatives through reference to such primitives" (47) and the apparent reference to 'segmental' units is "reference to the constituent 'Root node' in the feature hierarchy." (47) "Features may be unassociated at one stage of the derivation and become associated at another." (48) "Representations are constructed from *combinations* of these primitives."(48) The overall picture "is one in which the lexical formatives of a language are comprised of sets of F-elements, some linked, some free, that form paths governed by positive and negative implicational conditions." (51) "The notion of path simply defines a particular type of F-element relation

that occurs and that constitutes the domain of various implicational relations." (51))

4.2. An Analysis of Secondary Emphasis in the light of Grounded Phonology

The notion that neither underlying representations nor surface representations consist of discrete ordered sets of consonant and vowel segments adopted by Archangeli and Douglas Puueyblank.(1994) is useful in the analysis of this language phenomenon that has been called secondary emphasis in English. This is because the pronunciation of the consonants **t, d, δ, s** and **z** preceding low back vowels makes these adjacent consonants undergo a feature change, becoming **t̲, d̲, δ̲, s̲** and **z̲** This feature change of these consonants is problematic for segmental phonology. On the other hand, such a feature spread from the low back vowels to their preceding consonants is possible within the framework of grounded phonology since "features may be unassociated at one stage of the derivation and become associated at another" (48) and "representations are constructed from *combinations* of these primitives."(48)

Stressing the fact that Grounding Theory rules out particular implicational conditions, not particular feature combination, Archangeli and Douglas Puueyblank (1994) say that the combination of retraction and tongue body height is not ruled out by Grounding Theory. They say that what is "impossible... is an implicational condition that *requires* the marked configuration whereby high vowels are retracted...as an implicational condition *disallowing* the unmarked configuration whereby high vowels are advanced."(198) This variation in feature combination may be related to the acoustic properties of [ATR]. Although

"both tongue body raising and tongue root advancement cause lowering of F_1 acoustically"; [and] "both tongue body lowering and tongue root retraction cause raising of F_1," (Archangeli and Douglas Puueyblank, 1994:248) "tongue height features and tongue root features can work together to additively increase or decrease F_1. " (249) Accordingly, the change in the features of the consonants t, d, δ, s, and z when they precede a low back vowel (making them t̲, d̲, δ̲, s̲, and z̲ involves If [+high] then not [-ATR]. Since these consonants are [+high] the effect of an adjacent a low back vowel is that they acquire the feature not [-ATR]. That is, these consonantal sounds cannot altogether become [+RTR] sounds because they are coronal sounds; but their pronunciation may involve some slight tongue retraction expressed as not [-ATR]. The effect of the acquisition of this featural spread "is to raise somewhat the first formant that would otherwise have been lowered by the high specification" (249). In other words, there is" a trade- off between the lowering of F_1 produced by the [+high] specification and the raising of F_1 produced by the [-ATR]. " (Archangeli and Douglas Puueyblank, 1994:255)

This process goes counter to the fact that "the raising of the tongue body tends to correlate with tongue root advancement." (173) i.e. "[+high] implies [+ATR], not [-ATR]." (173) "Downward displacement of the tongue body tends to correlate with tongue root retraction." i.e. " [+low implies [-ATR], not [+ATR]". (173) But "the degree of tongue root advancement varies with tongue height, with greater advancement in high vowels than in mid, and greater advancement in mid vowels than in low." (174) There is also "greater advancement with front vowels than with back." (174) "Tongue root advancement *enhances* tongue body raising, and tongue root retraction *enhances* tongue body lowering." (174) Accordingly, "it is important

to note that interdependency between tongue root and tongue body movements constitutes a tendency, not an absolute correlation" (175) and that "tongue root specifications are filled in by the assignment of either [+ATR], the unmarked, or [-ATR], the marked pattern." (186) This is in keeping with Diana Archangeli and Douglas Puueyblank's (1994) claim that "more variation is possible in languages in which the harmonic value is a property of both vowels and consonants;" i.e. "where harmony takes place from a vowel to adjacent consonants or from a consonant to an adjacent vowel." (7) What happens in secondary emphasis is an inverse process of the unmarked rule of [+ATR] Insertion, which has a grounded condition on its Target. In the spread of secondary emphasis, we have a marked rule that falls on the realm of Grounding Conditions II. And this articulatory perspective of tongue root movement interacting closely with tongue body movement of tongue body raising and lowering is reinforced acoustically, as we have seen. "The primary acoustic correlate of tongue root advancement is a lowering of the first formant frequency"; but "tongue root retraction correlates with a raising of the same formant." (Diana Archangeli and Douglas Puueyblank, 1994: 7)

In summation, the *Leftward Emphasis [-ATR] Spread* in 4.2.1. is proposed in accordance with the theory of Grounded Phonology :

4.2.1. *Leftward Emphasis [-ATR] Spread*

Argument
[-ATR]
Parameters
1. Function: INSERT
2. Type: F-ELEMENT

3. Direction: LEFT TO RIGHT
4. Iteration: ITERATIVE

Structure requirements
1.Argument structure: NONE
2.Target structure: Free

Other requirements
1.Argument condition: SECONDARY PLACE
2. Target condition: NONE

The argument condition is secondary emphasis; i.e. involving pharyngealization with 2Place articulation as is characteristic of secondary emphasis, a shown above by Davis (1995) There are also no target conditions since spreading extends leftwards until the beginning of the word; i.e. until the onset of the syllable. This spread rule that is applicable to the English data under study is "triggered by a pharygealized low vowel that pharyngealizes"(Davis, 1995: 486) [+high] consonants at the onset of its syllable. That low vowels may cause pharyngealization is also voiced Davis (1995), who regards pharyngeals, laryngeals and low vowels as a natural class: "they all are characterized by the presence of the Lower V(ocal) T(ract) node."(489) Davis (1995) also says that " the assumption that low vowels are characterized by the presence of the Lower VT node is compatible with the view of Herzallah (1990) and MaCarthy (1991), who hold that low vowels can be represented as having a Pharyngeal node."(490) It is quite remarkable that all these linguists are referring to a phenomenon that pertains to Arabic and yet it is also applicable to English, verifying its universality.

5. Conclusion

The conclusion that can be drawn from the above discussion is that the language phenomenon called secondary emphasis seems to be a universal one. In its unmarked form, it is linked to low back vowels. In its marked form, it is linked to primary emphatic sounds, which are in themselves marked sounds since they are contrastive with or without low back vowels. The marked emphatics are found in Arabic; but the ones found in English represent unmarked option. But the secondary emphasis found in English involves a marked rule since it involves the cooccurrence of two antagonistic features: [+high] and [-ATR]. It, accordingly, pertains to the Grounding Conditions II as it relaxes some of the conditions of the Grounding Conditions II. This spread rule is different from that applicable to the Arabic language as in the latter language the rule leads to the derivation of a vowel of a different quality; i.e. one that has the feature [-high]. In English, on the other hand, the spread rule does not lead to the derivation of a different set of consonants with the feature [-high]. Rather, the rule leads to the derivation of the same set of consonants but with a slightly more retracted tongue root or a slightly less advanced tongue root. This difference between Arabic and English as regards the same language phenomenon which been called secondary emphasis is probably because in the former language it applies to vowels; while in the latter language it applies to consonants.

This study has also shown how a feature analysis of the same language phenomenon is correlated by an acoustic analysis. Both analyses show that low back vowels may be regarded as pharyngeal sounds. This is

shown by their capacity to bring about secondary emphasis and their formant formation. It is also shown from the articulatarily perspective. They are sounds produced by the lower vocal tract just as the primary emphatic sounds in Arabic are produced. They also involve the feature [+RTR], which is also characteristic of emphatic sounds in Arabic.

End-Notes

1. I would like to thank my father, Professor M.M. Ghaly, whose efforts have led to the presence of the spectrograph at the Faculty of Languages and Translation at AL-Azhar University (the men's section). I would also like to thank all of my subjects, who have been most generous with their time with me. Without them, this study would not have taken place. Last but not least, I would like to thank the technicians for their helpfulness and generosity of time.

Notations used in this study
Consonantal sounds
Stops
p and **b** voiceless and voiced bilabial stops.
t and **d** voiceless and voiced apical dental stops.
k and **g** voiceless and voiced velar stops.
? voiceless glottal stop.
q voiceless uvular stop .
j voiced palatal stop.

Fricatives
f and **v** voiceless and voiced labio- dental fricatives.
s and **z** voiceless palatal fricatives.
s voiceless palatal fricative.

θ and ð voiceless and voiced interdental fricatives.
h voiceless glottal fricative
x and ɣ voiceless and voiced uvular fricatives.
ḥ and ʕ voiceless and voiced pharyngeal fricatives.

Emphatics

ṭ and **ḍ** voiceless and voiced dental apical emphatic stops.
ṣ and **ẓ** voiceless and voiced dental emphatic fricatives.
ð̲ voiced interdental emphatic fricative.

Resonants

r trilled resonant in Arabic and a retroflex in American English.
l lateral resonant

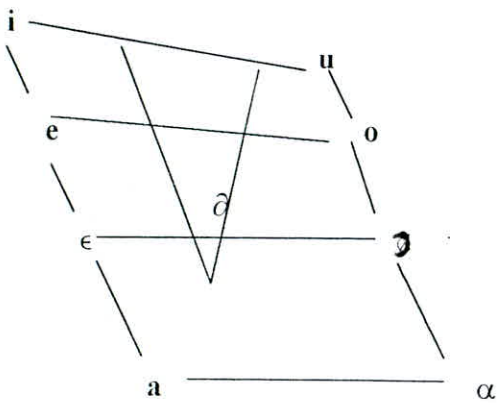
Nasals

m bilabial nasal
n dental nasal
ṉ velar nasal

Semi - Vowels

w velar semi- vowel
y palatal semi- vowel

The English Vowels (D. Jones, 1980:92)



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تقديـــم

يسعد اسرة حولية كلية الأداب ان تقتحم الالفية الجديدة بذاد فكرى متنوع ومتميز ممثلاً فى بحوث هذا العدد الخامس والثلاثين وهى بحوث متنوعة موضوعاتها (ادبية / تاريخية / نقدية / إجتماعية / إسلامية / مقارنة / نفسية / فنية ....) ومتنوعة مصادرها لانهامن باحثين من جامعتنا المصرية والعربية .

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أد / محمد نجيب التلاوى

عميد الكلية ورئيس مجلس الادارة

شروط النشر بالمجلة

يبدأ البحث بالعنوان على النحو التالى:

١ – عنوان البحث أعلى الصفحة الأولى مباشرة خط رياض«١٨» يليه اسم الباحث (كوفى مايل ١٢) بعده خط مجدول.

٢ – الكتابه بنط ١٤ خط نديم المسافة بين السطور صفر اما فى IBM بنط ١٤ خط سمبل أربك والمسافة بين السطور مفرد .

٣ – مساحة الكتابة ١٢ سم عرض × ٥ر١٩سم طول بما فيهم الرقم.

٤ – العناوين الداخلية رياض بنط ١٤ مائل أما فى IBM كوفى ١٥ مائل .

٥ – يتم اثبات المراجع والحواشى فى نهاية البحث مباشرة وتوضع فى متن البحث وفقا لرقمها.

٦ – لايقبل اى بحث للنشر الا بعد تحكيمه علمياً من اساتذة متخصصين.

٧ – يفضل الابحاث التى لايزيد حجمها عن ٤٠ صفحة حسب شروط النشر.

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المجلد الخامس والثلاثون
الجزء الثالث

يناير ٢٠٠٠

التفخيم الجانبى Secondary Emphasis فى اللغة الأنجليزية و العربية

للدكتورة هدى محمد غالى

فى محاولة لأثبات ان وجود سمات مشتركة universality فى لغات العالم ليست محصورة فى تركيب الجملة و أنما توجد أيضا على مستوى صوتيات اللغة ، يهدف هذا البحث أن يوضح أن ظاهرة التفخيم الجانبى ليست محصورة على اللغة العربية فحسب، فيوضح هذا البحث عن طريق جهاز الأ سبكتروجراف spectrograph أن اللغة الأنجليزية يوجد فيها أصوات – ت، د، س، ز، ذ فى كلمات مثل tip, dean, see, zizi, breathe ، ولكن تتحول هذة الأصوات الى ط ، ض ، ص ، ظ فى كلمات مثل top, dawn, saw, zaza, brother، و هذا التحويل فى الوصوتيات يثبت بطريقين وهما عن طريق الأ سبكتروجراف كما سبق أن ذكرنا والطريقه الأخرى هى النظرية الصوتية التى تسمى الصوتيات الأرضية سنة ١٩٩٤ Grounded Phonology لأرش أنجلى و بوليبلانك Diana Archangeli and Douglas Pulleyblank (1994) ، فهذة النظرية تفترض أن أى تغير صوتى فى أى لغة لا يخرج عن أطار فسولوجية جسم الأنسان، فبناء على هذه النظرية تغير هذة الأصوات فى اللغة الأنجليزية تماشيا مع فسولوجية جسم الأنسان، وذلك لأنه عندما تكون هذه الأصوات قبل الحرف المتحرك التى ينطق فى خلف اللسان فى هذه الحالة يكون الفم مفتوحا - و يرمز الى ذلك الحرف المتحرك ب α - فلابد أن اللسان يرجع الى الخلف قليلا وبذلك الرجوع تتحول الأصوات t,d,s,z, and δ الى t,d,s,z, and δ فى كلمات مثل top, dawn, saw, zaza, brother ، ويرمز لهذا التغير فى النظرية الأرضية على ان الأصوات t,d,s,z, and δ أكتسبت السمة الصوتية [-ATR] ولهذا تحولت الى اصوات t,d,s,z, and δ وهذا يعنى أنه أصبح بيها تفخيم ولكنه تفخيم بسبب مجاورنها للحرف التحرك α .

اما التحليل عن طريق جهاز الأ سبكتروجراف فقد آثبت عن طريق الصور الموجودة بالبحث ان الخصائص الصوتية لكلمات top, dawn, saw, zaza, brother هى الخصائص الموجودة فى أصوات ط ، ض ، ص ، ظ الموجودة فى اللغة العربية، وهذة الخصائص هى ان formants [1 and 2] يكونان متبعدين بعضها عن بعض و تكون formants [1] مرتفعة بعض الشىء بناء على تعريف ماكارثى فى مقالة سنة ١٩٩١ John McCarthy 1991.