University of Ibn Khaldoun –Tiaret
Faculty of Letters & Languages
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Section of English

ENGLISH ARTICULATORY PHONETICS

LEVEL: SECOND YEAR "LICENCE"

FIRST SEMESTER

SUCCINCT

Phoneme as a smallest segmental unit

Allophones: sound/phone/voice

Supra-segmental Phonetics

Constraints in Phonotactics

Consonant clusters

Language Syllables

English Syllable

Pitch: highness/lowness of voice

Intonation

Tone unit: High and low heads

Assimilation

Regressive/progressive

English Phonetics

Notions of **Phonetics & Phonology**

Sound & Phoneme

1.1. Phonetics: Definition

Phonetics /fə'netɪks/ is the subfield of linguistics that studies the physical properties (aspects/characteristics) of human sounds/ phones, and the processes of their physiological production. The minimal linguistic unit in phonetics is the 'phone'__ a speech sound in a language. Any utterance is produced using the different organs of speech 'passive & active articulators', such as the teeth, tongue, the velum, etc.

1.2. Phonology /fə'nɒlədʒi/ is grounded in phonetics and is a subfield of linguistics that studies the sound system of a specific language or languages. Phonology describes the way sounds function within a given language or across languages. In other words, phonology is the abstract study of sounds and how these sounds are used to convey meaning. The minimal functional distinctive unit of phonology is **the phoneme** /'fəuni:m/**.** In other words, a phoneme is the mental representation of a speech sound or different sounds (no physical reality). It is a meaningful unit. By meaningful unit, we mean that it has a contrastive function (it is responsible for the change of meaning). It is a unit of sound that can distinguish one word from another in a particular language. For example, if we substitute the consonant phoneme /**f**/ for /**r**/ in a word like 'rat' /**r**æt/, it would result in 'fat' /**f**æt/. Similarly, the sound pattern /si**n**/ 'sin' and /sɪ**ŋ**/ 'sing' are two separate words that are distinguished by the substitution of one phoneme, /**n**/ for /**ŋ**/. Similarly, the world 'l**e**t' can be distinguished from 'l**i**t' just by substituting /ɪ/ for /e/ in word-medial position. In this situation, when two words differ in meaning through the contrast of a single phoneme, these words form what is referred to as '*minimal pairs'*. More accurately, they can be classified as '*minimal pairs'* in the *phonology ofEnglish*. For (Gimson 1989), they are pairs of words which are different in

respect of only one sound segment. This difference which may occur in one of the three positions in words will lead to a change of meaning.

Phonemes usually fall into two classes: consonants and vowels. Differences in words may depend on differences between these classes in different environments.Phonemes are conventionally placed between slashes in transcription / /.

Examples of the contrast of phonemes in different environments are as follows:

In monosyllabic words:

1.   Initially: 'bat' /**b**æt/ and 'rat' /**r**æt/ differ in only one consonant, i.e., /**b**/ and /**r**/ .
      (Initial phonemes are in contrast)
2.   Medially: 'h**i**t' /h**ɪ**t/ and 'h**a**t' /h**æ**t/ differ in only a vowel, i.e., /**ɪ**/ and /**æ**/. (medial phonemes are in contrast)
3.   Finally: 'rin**g**' /rɪ**ŋg**/ and 'rin**k**' /rɪ**ŋk**/ differ in only one consonant, i.e., /**g**/ and /**k**/. (final phonemes are in contrast).

In disyllabic words:

1.   Initially: 'harden' /**h**ɑːdən/ and 'garden' /**g**ɑːdən/ differ in only one consonant, i.e., /**h**/ and /**g**/ . (Initial phonemes are in contrast)
2.   Medially: 'rider' /'raɪ**d**ə/ and writer /'raɪ**t**ə/ differ in only a vowel, i.e., /**d**/ and /**t**/. (medial phonemes are in contrast)
4.   Finally: 'riddle' /rɪd**l**/ and 'ridden' /rɪd**n**/ differ in only one consonant, i.e., /**l**/ and /**n**/. (final phonemes are in contrast).

*Note:*All of the possible minimal pairs in different languages can be set out in this way.

1.3. Sounds in RP English

Speech sounds that differ but do not create a change in meaning in words are known as '**allophones**' /ælə'fəunz/. Allophones, which are placed between square brackets **[]**represent the different realizations of the same phoneme in a certain phonetic environments, yet not all speakers produce them similarly. They may be free and vary in the articulation of different speakers of languages or dialects, yet this variation in sound production would have no effects on word meaning. Allophones belonging to the same phoneme result in great phonetic differences in different environments, the /p/, for example, is articulated initially as [pʰ],

aspirated initially, yet weakly aspirated [p**'**] in word-final position or before a vowel in unaccented syllables, as successively in: 'important', and 'polite'. 'Similarly, /l/ in 'legal' is initially clear **[l]**, yet dark **[ɫ]** and velarized in final position. The long vowel /i:/ is fully long before a final voiced consonant as in the case for **[i:]** in 'seed', yet is submitted to reduction in length **[i·]** before a voiceless consonant as in 'seat'**.** The difference in quality is related both to the position of the phoneme in the word or syllable and the adjacent sounds, i.e., phonetic context. In the case of the stated examples, the allophones of the same phoneme which occur in different situations are said to have a '***complementary distribution'***: when one never occurs in the same phonetic environment of the other, i.e., they are mutually exclusive. An example of that is the unaspirated [p̿], when preceded by initial [s], as in 'spark'[sp̿a:k'], and the aspirated [pʰ] initially in accented syllables, as in the case of 'park' [pʰɑ·ʔk']. In this case we say that 'unaspiration' and 'aspiration' are mutually exclusive in the two environments.

Sometimes speakers of English do not give the same quality to the same sound according to the contexts it is in, i.e., they produce slightly different pronunciations of the sound. In this case no effect would be made on meaning, and the different realizations of the phonemes are said to be in '***free variation'***. Free variation can be found between the realizations of separate phonemes, which is referred to as 'phonemic free variation', as in /i:/ & /aɪ/ of 'either', and between the allophones of the same phoneme, 'allophonic free variation', as in the choice of /ɪ/, or /i/ in final position of the word 'happy', which is transcribed either as /hæpɪ/ or /hæpi/. In actual speech, the initial vowel of the verb 'affix' is in free variation between the schwa /ə/ and the full vowel /æ/; thus this word can be pronounced by some speakers as /ə'fɪks/, and by others as /æ'fɪks/.

In Algerian Arabic, for example, the **[د]**/**d**/ and**[ض]** /d̪/ are allophones of the phoneme / **ض** / articulated in the word 'ضو' 'light'. In Oran, speakers produce it as 'دو'[dʌw]; while speakers in other Algerian regions produce it as 'ضو'. **[d̪ʌw]**. The French sounds [ʁ] and[r] are pronounced alternatively by French speakers in some parts of France. The same case is for some of the Algerian speakers of French who use this language in their daily speech or at work. The choice of the articulated sound is an indication of the identity of the speaker. Labov (1963) says that "free variation has sociological parameters", i.e., through his pronunciation, we can identify the social origin of the speaker.

SECTION TWO

(2) SUPRASEGMENTAL PHONETICS

ENGLISH PHONOTACTICS

2. 1. English Phonotactics: Definition

   Phonotactics is a branch of phonology that deals with restrictions in a language on the permissible combinations of phonemes. Phonotactics defines permissible syllable structure, consonant clusters, by means of ***phonotactic constraints***; i.e., what is permitted and what is not permitted as consonant clusters, onsets, and codas in syllables in any language. What is allowed in a language syllable may not be allowed in another. Phonotactic constraints are then language specific. For example, in Japanese, the /**st**/ as a consonant cluster does not occur in all environments. Similarly, in English /**tl**/ and /**pw**/ are not permitted initially in accented syllables.

 2.1.1. English Consonant clusters:

 The English monosyllabic word *twelfths* /twelfθs/ is divided into the onset /**tw**/, the nucleus /**e**/ and the coda /**lfθs**/; thus, its structure can be formed as CCVCCCC, where (C = consonant, and V = vowel). On this basis, it is possible to form rules for which representations of phoneme classes may fill the cluster before and after the vowel. This means that a vowel is not counted in the cluster, yet it is the part which, in some cases, separates the onset from the coda, form the syllable by its own.

   RP English allows at most three consonants in an '***onset***' (initial consonants before the vowel), provided that they are structured as follows:

  /s/ + stop + approximant:
- /s/ + /t/ + /ɹ/ in : *stream*
  - /s/ + /t/ + /j/ (not in most accents of American English) in: *stew*
    - /s/ + /p/ + /j ɹ l/ in : *sputum, sprawl*, *splat*
      - /s/ + /k/ + /j ɹ l w/ in : *skew*, *scream*, *sclerosis*, *squirrel*
        https://en.wikipedia.org/wiki/Phonotactics

2.1.2. English Phonotactics constraints:

RP English Phonotactics has some restrictions in the formation of syllables and consonant clusters. They are referred to as '***constraints***'. They can be summarized as follows:

- All syllables require a vowel / nucleus
- No onset starting with /ŋ/ ,i.e., /ŋ/ does not occur in word-initial position
- /**h**/ does not occur in word-final position
- No consonant clusters + an affricate or /h/ in word-initial position, as in: /sjdʒ/ or /sph/.
- The initial consonant in a complex onset must be an obstruent, such as /s/ in: (*still*). Sequences such as */ntil/* or */rkip/*, with a sonorant, are not permitted)
- A voiced obstruent, such as /**d**/ is not permitted as a second consonant in a complex onset, as in: */sdæd/*
- If the first consonant in a 'complex onset' (sequence of an obstruent & a liquid) is not /s/, the second must be a liquid or a glide, as in: quarrel, proud, trouble
- /**r**/, /**ŋ**/, /**ʒ**/, or /**ð**/ do not occur as second consonants in a complex coda as in the word "*asthma*", basically articulated as /ˈæzmə/ or /ˈæsmə/.
- If two obstruents occur in the same coda, they must share the same voicing feature, as in: f*iends*/fren**dz**/, as compared with *parents* /ˈpeəren**ts**/.

2.2. English Syllable Structure:

A syllable is formed through a sequence of speech sounds, namely one or more consonants and a vowel only. For example, the word '*teacher*' is composed of two syllables: '*tea*' and '*cher*'. A syllable is then split into a vowel, referred to as (nucleus), with initial and final consonants as optional margins.

Phonologically, a syllable is considered as the rhythmic part in a word. It can influence the prosodic features of any language. This may include pitch and stress patterns.

A word that consists of a single syllable is called a **monosyllabic** word. A word with two syllables is referred to as **disyllablic** word; and the one with three syllables is called **trisyllablic** word, which may refer either to a word of more than three syllables or to any word of more than one syllable. Linguists like to use the Greek Letter sigma (**σ)** to label the whole syllable. In most theories of phonology, the general structure of a syllable consists of three segments:

(Syllable) **σ**

Onset **(ω)**   Rime **(ρ)**

Nucleus (**v**)Coda **(κ)**
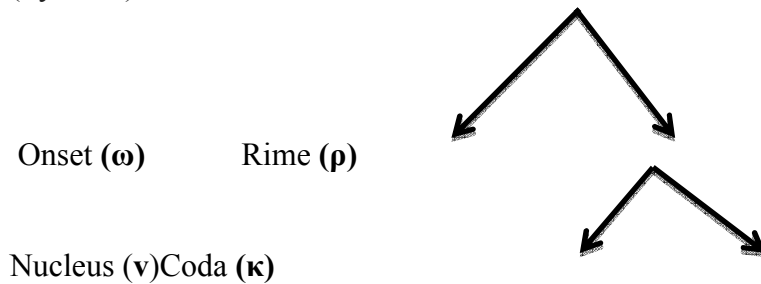
a) Onset(ω): (optional)

The *onset*is the consonant sound or sounds that form a cluster at the beginning of a syllable, occurring before the nucleus. Most syllables have an onset. Some languages restrict onsets to be only a single consonant; while others allow multi-consonant onsets according to various rules. For example, in English, onsets such as *pr-*, *pl-* and *tr-* are possible but *tl-* is not, and *sk-* is possible but *ks-* is not. In Greek, however, both *ks-* and *tl-* are possible onsets, while contrarily in Classical Arabic no multi-consonant onsets are allowed at all, as in: 'كتب' /kataba/ CVCVCV.In English, except for /ŋ/, all consonants can appear as onsets. In the following examples the onsets are in bald type: **f**at, **sp**eak, **str**ing.

Note: If the first syllable of a word begins with a vowel, this syllable has a **zero** onset, as in '**a**pply', '**a**rtist'

b) Nucleus (v): (obligatory)

The *nucleus* is the **vowel** usually seen as the core(body)andessential part of a syllable, which is obligatory, as in: '**ma**d' /mæd/, '**ma**te' /meɪt/, '**sta**rt'/stɑːt/. Generally, every syllable requires a nucleus (sometimes called the '***peak***'), and the minimal syllable consists only of a nucleus, as in the English words "eye" /aɪ/ or "owe" /əu/. The syllable nucleus is usually a vowel, in the form of a monophthong, diphthong, or triphthong, but sometimes is a syllabic consonant when the schwa vowel is dropped due to a sort of assimilation made by the influence of sonorants following obstruent consonants. The most common syllabic consonants n RP English are [m], [n], [ŋ] and [l].

c) Coda (κ): (optional)

The **coda** comprises the consonant sound or sounds that follow the nucleus in a syllable. The coda may exist in some syllables, as in: 'mea**n**' /**n**/, 'figh**t**' /**t**/, 're**d**' /**d**/; 'roa**ds**' /rəu**dz**/, 'pare**nts**' /peə**rents**/. There are syllables which consist of only an onset and a nucleus with no coda, as in: 'high' /haɪ/, 'star' /stɑː/, 'hay' /heɪ/; while others are represented only by a

nucleus, as in: 'are' /**aː**/, and 'owe' /**əu**/. Some languages' Phonotactics, such as Arabic limit syllable codas to a small group of single consonants, whereas RP English allows a number of consonant clusters stretching to four consonants.

In English syllables, a coda can be in the form of V, in 'are'; CV, in 'high', and CCV, in 'plough', etc. , where **V** stands for 'vowel', and **C** for 'consonant'. These kinds of syllables in the stated examples are referred to as **open syllables** (or *free syllables*), while syllables that have codas: VC in 'all', CVC, 'take', CVCC, in 'build', etc.) are called **closed syllables** (or *checked syllables*). Contrary to most languages that allow open syllables, there are only a few, such as Hawaiian, which lack closed syllables. As opposed to the coda, the body is the left branch, and splits into onset and nucleus.

Here are some English single-syllable words that have both a nucleus and a coda (i.e. closed syllables), where ν denotes "nucleus" and κ "coda":

* i*n*: ν = /ɪ/, κ = /n/   * cu*p*: ν = /ʌ/, κ = /p/   * ta*ll*: ν = /ɔː/, κ = /l/
* mi*lk*: ν = /ɪ/, κ = /lk/   * ti*nts*: ν = /ɪ/, κ = /nts/   * fi*fths*: ν = /ɪ/, κ = /fθs/
* si*xths*: ν = /ɪ/, κ = /ksθs/   * twe*lfths*: ν = /e/, κ = /lfθs/   * stre*ngths*: ν = /e/, κ = /ŋθs/

(Wikipedia 1: 2020)

d) Rime (Rhyme) (ρ) (obligatory)

Contrasting with the onset, the rime/rhyme can be explained as the part on the right which contains the nucleus and an optional coda. In other words, the rime is the part of a syllable stretching from the first vowel to the end. For example, /æt/ is the rime of all of the words *at* /æt/, *pat* /pæt/, and *plat* /plæt/.

Although the two are variants of the same word, "Rime" is more suggested in phonetics to mean specifically "syllable rime» than "rhyme" usually used in poetry.

In riming, it is worth mentioning a useful concept, namely the **'tone'**, which enters into the construction of intonation for more emphasis on the distinction between lexical and grammatical meaning. The tone may constitute a whole syllable or the part after the nucleus (rime)

Syllable tree diagrams

In some theories of phonology, these syllable structures are displayed as **tree diagrams** (similar to the trees found in some types of syntax).

In the one-syllable English word '*mat*', the nucleus is / æ /, the onset / *m* /, the coda / *t* /, and the rime / **æt /**. This syllable can be abstracted as a ***consonant-vowel-consonant*** syllable, abbreviated ***CVC***. The syllable structure of the word 'mat' can be structured as follows:

σ

Onset **(ω)**   Rime **(ρ)**

Nucleus **(v)**   Coda **(κ)**

m æ   t
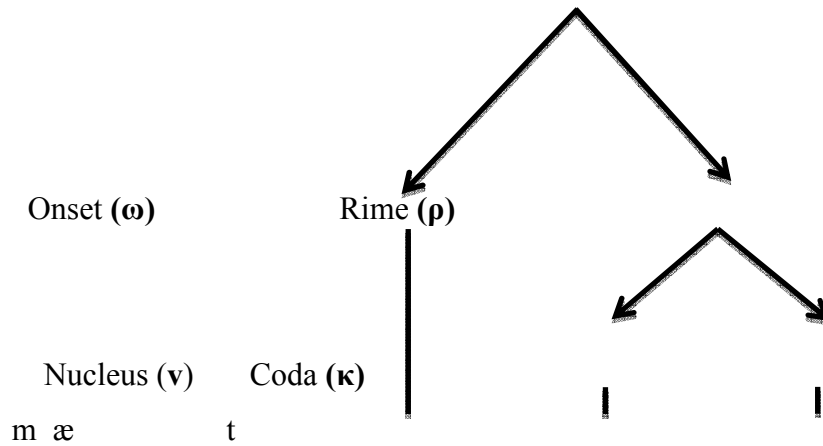
The diagram below shows the structure of the word 'strengths'

Syllable σ

Onset   Rime

Nucleus   Coda

s   t   r   e   ŋ   θ   s
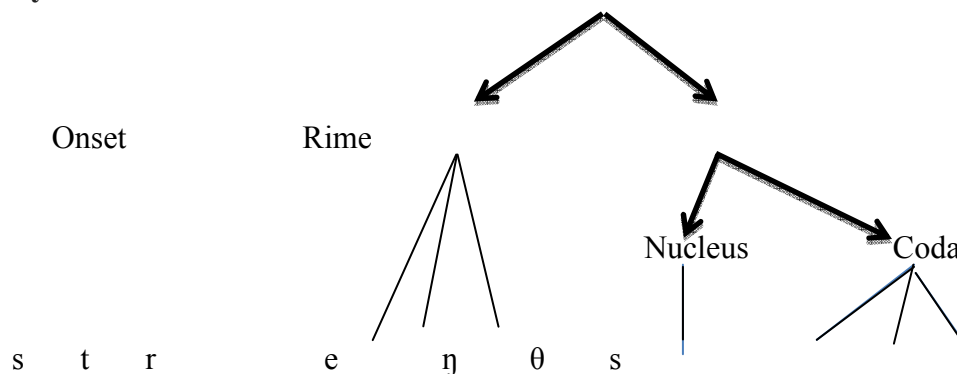
Hierarchical model for 'strengths'

ENGLISH PHONOTACTICS
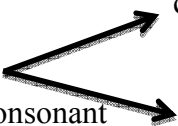
SECTION THREE

WORD TRESS

English Word Stress

3.1. Word Stress: Definition

When we talk about stress, we talk about the intensity of the syllable. It means that there is more air in the syllable. The syllable on which there is stress is perceived as a greater loudness. The two parts of speech of the word 'insult' (n) /'ɪnsʌlt/ and 'insult' (v) /ɪn'sʌlt/ are distinguished by pitch pattern. Pitch means high and low frequency. It is the sensation of sound. It is with stress that pitch is rendered. Stress and pitch make the syllable prominent. We have stress when we have energy. The voiced sounds, for example, result in a great intensity of sound on syllables. Such intensity is perceived by the listener as greater loudness. In all, a stressed syllable should be louder, higher and longer in duration than the remaining unstressed syllables.

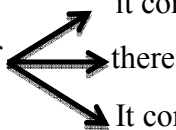**3.1.1. Stress in disyllabic Words:** Either the 1st or the 2nd is stressed

3.1.1.1. in Verbs:

1) 2nd syllable is stressed if it

contains a long vowel or diphthong

ends with more than 1 consonant

In these examples, the 2nd syllable is stressed

apply /ə'plaɪ/

attract / ə'trækt/

2) Final syllable is not stressed if

it contains a short vowel

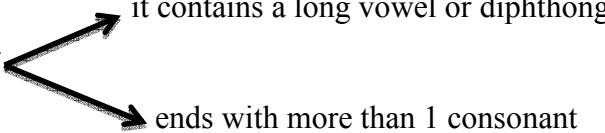there is 1 or no final consonant

It contains the diphthong /əʊ/

In these examples, the 1ˢᵗ syllable is stressed

enter / 'entə/

open / 'əʊpən /
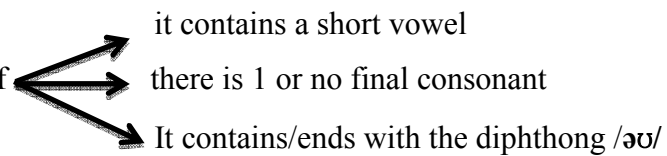
follow / 'fɒləʊ /

3.1.1.2. inAdjectives:

1) 2ⁿᵈ syllable adjective is stressed if → it contains a long vowel or diphthong

→ ends with more than 1 consonant

In these examples, the 2nd syllable is stressed

divine / dɪ 'vaɪn /

correct / kə're**kt** /

alive / ə 'laɪ**v** /

2) Final syllable is not stressed if → it contains a short vowel

→ there is 1 or no final consonant

→ It contains/ends with the diphthong /əʊ/

In these examples, the 1ˢᵗ syllable is stressed

lovely / 'lʌvlɪ /

even / 'iːvən /

hollow / 'hɒləʊ /

3.1.1.3. inNouns:

1) If the second syllable contains a short vowel, stress is put on the 1ˢᵗ syllable

money / 'mʌnɪ /

product / 'prɒdʌkt /

2) The second syllable is stressed if it contains a long vowel or diphthong.
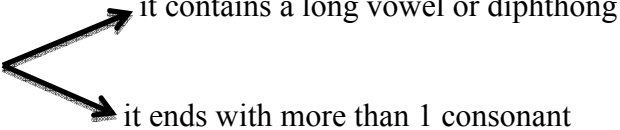
estate / ɪs'teɪt /

balloon / bə'luːn /

3.1.2. Stress in 3 Syllable words:
3.1.2.1. in Verbs:

1) Final syllable is unstressed if it contains a short vowel and ends with no more than one consonant. Stress will be placed on the penultimate (preceding) syllable.

encounter / ɪŋˈkaʊntə /

determine / dɪˈtɜːmɪ**n** /

2) Final syllable is stressed if ⟶ it contains a long vowel or diphthong

⟶ it ends with more than 1 consonant

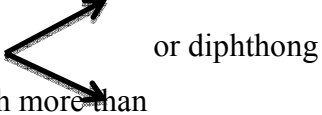entertain / intəˈteɪn /

resurrect / rɪzəˈrekt /

3.1.2.2. in **Nouns** stress requires different rules.

1) Final syllable is unstressed if It contains a short vowel or the diphthong /əu/. Stress will be put on the preceding syllable.

disaster / dɪˈzaːstə /

potato / pəˈteɪtəʊ /

it contains a long vowel
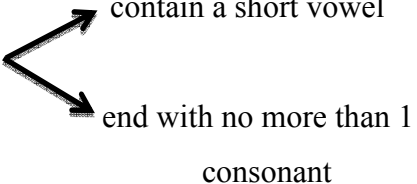
2) Middlesyllable preceding the final syllable is stressedif ⟶ or diphthong

it ends with more than

1consonant

researcher / rɪˈsɜːtʃə /

mimosa / mɪˈməʊzə /

postgraduate / pəʊstˈgrædjuət /

3) First syllable is stressed if both middle & final syllables ⟶ contain a short vowel

⟶ end with no more than 1 consonant

quantity / ˈkwentɪtɪ /

emperor / ˈempərə /

custody   / kʌstədɪ /

3.1.3. Stress in 4 Syllable words:

1) Second syllable is stressed if the word ends in: **__cy,   __ty,   __phy, __gy, or __al**

emergen**cy** /ɪ'mɜ:dʒənsi /

celebri**ty** /sə'lebrəti/

philoso**phy** /fɪ'lɒsəfɪ/

geolo**gy** /dʒi'ɒlədʒi /

symmetri**cal** /sɪ'mektrɪkəl/

2) Third syllable is stressed if the word ends in: **__tion,   __sion,   __ic**

infiltra**tion** /ɪnfɪlt'reɪʃən/

televi**sion** /telə'vɪʒən/

scienti**fic**/saɪən'tɪfɪk/

IV.1.4. Stress in 5 Syllable words:

1) Forth/penultimate syllable is stressed if the word ends in: **__tion**

alliteration /əlɪtə'reɪʃən/

imagination /ɪmædʒə'neɪʃən/

2) First, second or third syllable is stressed if the word ends in: **__cy**

independency /ɪndɪ'pendənsi/

insufficiency /ɪnsə'fɪʃənsi/

3) Third syllable is stressed if the word ends in: **__ity, __ate**

probability /prɒbə'bɪlɪti/

instability /ɪnstə'bɪlɪti/

indiscriminate /ɪndɪ'skrɪmɪnɪt/

unaffectionate /ʌnə'fekʃənɪt/

3.1.5. Stress in 6 Syllable words:

Stress in 6 syllable words change from word to another, there are not any precise rules: here are some examples:

instrumentality /ˌɪstrəmenˈtæləti/

discriminatory /dɪˈskrɪmɪnətəri/

incommunicable/ˌɪnkəˈmju:nɪkəbəl/

electromagnetic /ˌɪlektrəumægˈnətɪk/

extraterrestrial /ˌekstrətəˈrestriəl/

parliamentarian /ˌpa:ləmənˈteərɪən/

emancipationist /ˌɪmænsɪˈpeɪʃənɪst/

materialism /məˈtɪərɪəlɪz(ə)m/

indiscrimination /ˌɪndɪskrɪmɪˈneɪʃn/

superiority /su:pɪərɪˈɒrɪtɪ/

bibliography /bɪbliˈɒgrəfi/

sarcastically /saˈkæstɪk(ə)lɪ/

———————————————

SECTION FOUR
PͤROSODIC FEATURES
Pitch in English

4. 1. Pitch

How do you use pitch to communicate? What does tone mean in English? Is English a tone language? What's the difference between pitch, stress and intonation? Sudden changes and how one can use his/her voice can affect how clearly one communicates meaning of what s/he wants to say in English.

What is Pitch? When we talk about languages, pitch is the highness or the lowness of one's voice. In other words; it's the frequency of the sound waves one produces when speaking. We often talk about pitch when we're talking about singing, or playing a musical instrument. It's also extremely important when you're speaking English. In RP / American English we use

changes in pitch to emphasize keywords through words in sentence stress. By stepping up to a higher stress, we emphasize a specific syllable of a word. Pitch is one of the key elements that we need in order to emphasize a syllable with word stress. Native English speakers are listening for this higher pitch in order to hear us pronounce a word correctly. For example when we say: In the words: **note**book, ge**o**graphy, communi**ca**tion, to**day**, **li**sten, voice steps up to a higher pitch. (Repetition of 5 word articulation with much emphasis on pitch). Pitch is also used to highlight the most important words in the entire sentence. In other words, we focus attention on the keywords using our pitch. We stress or emphasize key syllables of these keywords to indicate that they are the most important ones. When we move up and down between these pitch levels when speaking, we create the natural melody of English in terms of waves. We rise up to a higher pitch and then we fall afterwards. We can hear these up and down, then up and down, then up and down. There's a high and fall of pitch between stressed syllables of stressed words and unstressed or reduced syllables that seem to become less obvious. If we listen closely, we can hear a consisting rise and fall of pitch; a kind like of our breathing or watching waves crash on the beach. We also use changes and pitch to communicate meaning through intonation. So how do we find our pitch? How do we use pitch in our voice? We may not be able to hear pitch changes in our voices. The most important thing to understand we talk about pitch in English is that the pitch we use is relative to each one of us and to each of one's own voice. The pitch levels available to one and his/herown voice will be different from the ones others can use. One may have a broader pitch range than another can have, or may have a smaller one. That's why it's so important that it would explore what is possible for one in his/her own voice. To sum up, pitch, in speech, is the relative highness or lowness of a tone as perceived by the ear. It is the main acoustic correlate of tone and intonation. It is governed by the rate of vibrations producing it. While high pitch has a high frequency, a low pitch has a low frequency. Frequency indicates how often vibrations occur. In music, pitch describes how high or low a note is. Pitch is also a major auditory element in musical tones, along with timbre, duration, and loudness. However, the pitch can be determined only if the sounds have a frequency that is clear and stable enough to differentiate from noise.In spoken language, pitch indicates the degree of highness or lowness with which one speaks. Some people naturally speak in a high-pitched voice. Emotions can also affect the pitch of someone's voice. For instance, sudden emotions like anger, surprise or joy can make a person speak in a higher pitch than usual. Likewise, a tired person may speak in a lower pitch.

In the work of the linguists Trager and Smith there are four contrastive levels of pitch: - **1**- low, **2**- middle, **3**- high, **4**- very high

4.2. Pitch & Loudness of sound

In our day-to-day life, we come across different types of sound, and we are well-equipped with a mechanism to understand different types of variations in the sound pattern. A mother talking to her kid has a different voice compared to that of the kid. Did you ever think why every person has a different voice? Let's learn about the loudness of sound, the pitch of the sound, and their difference.

4.2.1. Pitch of Sound

This category is made by the frequency of vibration of the sound waves.We say that the sound is intensive with a high pitch when the frequency of vibration reaches a higher degree. Contrarily, the sound gets a lower pitch when it has a lower frequency of vibration. This may be explained by the difference which exists between a woman's voice having a higher pitch than that of a man. Similarly, a bird produces a high-pitched sound; whereas, a lion, when roaring, hasa low-pitched sound.

4.2.2. Loudness of Sound

Loudness is usually measured by the amplitude of the sound wave. If itis large, the sound reaches its great loudness and can even be quadrupled, especially if the amplitude of the sound wave is doubled. Loudness which is expressed in decibel (dB) is directly proportional to the amplitude of vibration. According to different experiments, human ear does not support sounds on top of 80 dB, because in this case it becomes very noisy.

Various sources of sounds are illustrated in the following table:

Normal Breathing	10 dB
Soft Whisper (at 5 m)	30 dB
Normal Conversation	60 dB
Busy Traffic	70 dB
Average Factory	80 dB

The loudness of a sound wave is determined by its association with the amplitude, all types of waves have certain amplitude. For example, a height of a wave on a calm ocean will be less than 1 foot whereas good surfing waves might be 10 feet or more in amplitude. During a storm, the amplitude might increase to 40 to 50 feet.

4.2.3. Difference between Pitch and Loudness

Phoneticians often consider pitch and loudness as two sides of the same coin, yet the only difference is in term of tone quality. The pitch of a sound is when the ear responds to the frequency of sound; while loudness s related to the energy of the sound wave. In general, the pitch is the reason behind the difference in voice quality of different individuals.

4.3. Pitch in paralanguage

Pitch is determined by vocal characteristics and vocal interferences, which are the two main classes of paralanguage. Vocal characteristics represents the pitch (the highness or lowness of one's voice), volume (how loud or soft one's voice is when speaking), rate (the speed at which one's speaks) and voice quality (how pleasant or unpleasant one's voice sounds)

4.4. Volume

As referred to above, volume can be explained by the degree of loudness or softness of one's voice when speaking. This very often depends on the state that the speaker is in. In normal speech, there may be a balance between the two-volume rates, i.e., loudness and softness, and hence, extremes of being too loud or too soft are sometimes avoided to get an acceptable middle range volume. The volume rate in communication depends on to whom one's speech is addressed. It can be loud, quiet, or both at a given time. For example, if you want to call out someone who is standing at somewhat a long distance, then you need to project your voice (call higher); so that s/he can hear you well. However, there is no need to call high (make your voice high) if the person is sitting next to you. This is how loud or quiet your voice is. Varying volume is very important to communicate a range of emotions and situations. Anger or excitement, for example, can be communicated with a loud volume whereas fear could be shown by using a quiet voice.

4.5. Voice quality in volume

Voice quality is that component of speech where pitch and loudness are excluded and in which the primary distinction to a given speaker's voice is given. This quality involves **both phonatory and resonatory characteristics**. Some of the elements of voice quality are harshness, breathiness and nasality

4.6. Amplitude of a sound wave

The amplitude of a sound wave can be interpreted as the loudness of the vibrating particles of the medium from their mean position when producing the sound.Frequency is the number of vibrations made by a sound wave per second. The intensity of a sound depends on its loudness. When the amplitude rises, the sound is **perceived as louder**, whereas, if it decreases, the sound is perceived as softer. The degree of loudness then depends on the degree of intensity. In other words, the sound is perceived as louder if the amplitude increases, and softer if the amplitude decreases. The amplitude of a wave is explained by how much energy it carries.Thus, we say that when we have a large amount of energy, we geta high amplitude wave; contrarily, we get a low amplitude wave when we have a small amount of energy. The intensity of a wave can be defined as the average amount of energy passing through a unit area per unit of time in a specified direction. Relative sound intensities are often given in units named decibels (dB).

4.7. Rhythm

In phonetics, rhythm is what we feel in the movement of speech. It is usually marked bythe stress, timing, and quantity of syllables (the time occupied in its pronunciation). In poetry, rhythm is the recurring alternation of strong and weak elements in the flow of sound and silence in sentences or lines of verse. "*It is the musical quality produced by arrangements of accented and unaccented sounds and pauses. It is the repetition of the final accented vowel and following consonant. Usually, the rhyming words are at line ends*" (Colwell: 1973:28).In speech, rhythm is how words alternate according to their stressed and unstressed syllables. It shapesprosody andconstructs the patterns of stress and intonation in a language. Rhythm is an indispensable element of all music whatever other elements a given piece of music may have (e.g., patterns in pitch or timbre). Rhythm can exist without melody, as in the drumbeats, but the melody cannot exist without rhythm.

4.8. Timber

In phonetics, timber is the quality sensations produced by the tone of a sound wave, mostly during the perception of musical notes. In dealing with timber, we distinguish three kinds of sound production, namely choir, voices and different musical instruments, such as the 'clarinet' and woodwind instruments.

4.9. Melody of speech

Melody in speech enters in the way we express our feelings and emotions. It includes the falls and rises of the pitch of voice. When we say: 'Yes', for example with a rising pitch, we imply a question rather than a declarative statement. Melody is one of the main aspects of communication in social interactions.

SECTION FIVE
PROSODIC FEATURES
Intonation

5. Intonation

Intonation, in phonetics, is the melodic model of an utterance. It is primarily a matter of varying the pitch of the voice to indicate the attitude and emotions of a speaker. In languages like English, intonation is often accompanied by stress and rhythm to produce meaning. In other words, it is the way the tone of voice rises and falls when speaking or reciting something while singing it. An example of intonation is how one's voice rises at the end of a question, showing the difference between statements and questions, and between different types of questions themselves. With the variation of pitch, one focuses attention on correctly transmitting spoken messages so as verbal interactions are well regulated. Linguistically speaking, it is the use of pitch characteristics of a speaker of a language or dialect to convey syntactic information.

The term tone is used by some British linguiststo describe intonationin referringto the pitch movement found on the nucleus or tonic syllable in an intonation unit.. Intonation serves: 1)

to form sentences and tone-units; 2) to define communicative types of sentences (statements, questions, commands, exclamations); 3) to express the speaker's thoughts and attitudes.

Intonation primarily concerns pitch variation, whose functions are attributed to the speakers' expression of attitudes and emotions, help to determine the difference between statements and questions and highlight the importance of the verbal message uttered by the interlocutors. English language has three basic intonation patterns as falling intonation, rising intonation, and partial/fall-rise intonation.

1- **Falling Intonation:**depicts how a person's falling voice on the position where it is final in stressed syllables of a phrase or group of words. This usually occurs when one expresses a definite thought, or asks wh-questions.

- Where's the b↘us station?
- What time do we l↘eave?

2- **Rising intonation:** describes one's rising voice at the end of a sentence. This is expressed mostly in yes-no questions or in showing surprise.

- Is she c↗oming?
- Are you r↗eady?

*3-**Partial Intonation***:This kind of intonation includes both (fall-rise tones). It shows how voice rises then falls. The use of this intonation is when one doubts about something, or has more to add to a sentence. It is also used when asking polite requests.

- I do↘n't have any fans at the m↘om↗ent. (but I may have some in the future).
- It trained very hard during the firs↘t w↗eek. (but we reduced the tone in the coming days).

In asking questions, the use of fall-rise intonation is essential, especially when we ask for information or invite somebody to do or to have something. It is with this intonation patterns that the questions sound more polite:

- *Would you like another co ↘ff↗ee?*
- Tell me! Is this your pen↘cil↗?

Fall-rise and rise-fall tones followed by tail

The most basic distinction among English nuclear tones is that between falling and non-falling.

The various different kinds of falling tone (high fall, low fall, rise-fall) evidently have some degree of meaning in common. There is also something in common in all the various kinds of non-falling tone (high rise, low rise, mid-level, fall-rise), which we refer to as non-falls. However, here it is often necessary to distinguish between rises on the one hand and fall-rises on the other.

A popular idea among language students is that statements are said with a fall, questions with a rise. Also there is an element of truth in this generalization, it is very far from the complete truth. In English, at any rate, statements may have a fall – but they may also have a non-falling tone (a fall-rise or a rise). Questions may have a rise – but they may also have a fall. In general there is no simple predictable relationship between sentence type and tone choice. Nevertheless it is useful to apply the notion of a default tone (= unmarked tone, neutral tone) for each sentence type. As we shall see the default tone is

- a fall for statements, exclamations, *wh* questions and commands;
- a rise for *yes-no* questions.

Another useful generalization is that the default for utterances involving two intonation phrases is to have

- a fall on the main part, and
- non-fall on the subordinate or dependent part.

In a **falling** nuclear tone the pitch of the voice starts relatively high and then moves downwards. The starting point may be anywhere from mid to high. The endpoint is low. There may be some upward movement before the pitch moves downwards.

In the simplest causes the fall takes place on a single syllable. We see this in causes where the nuclear syllable is the only syllable in the IP, or where the nuclear syllable is the last syllable in the IP. The fall then happens on that syllable.

In identifying the nuclear tone we must disregard all the pitch levels and possible pitch movements that are found earlier in the intonation phrase, i. e. before the nucleus.

There is very often a step up in pitch as we reach the beginning of the nuclear fall. Do not let this mislead you into thinking that the tone is rising.

There may even be some upward movement at the beginning of the nuclear syllable. But as long as the pitch then comes down, it is a falling tone.

Often there are syllables after the nucleus, i. e. a tail. After a falling nucleus, the tail is always low. The fall (= the downward pitch movement) happens on or from the syllable that bears the nucleus (the lexically stressed syllable). The syllable(s) after the nucleus are low pitched.

If the vowel in the nucleus syllable is short, or if this vowel is followed by voiceless consonant, there may be insufficient time for the fall to be heard on the nuclear syllable itself. The effect is then one of a jump from higher pitched syllable (the nucleus) to one or more low-pitched syllables (the tail). The overall pitch pattern is still a fall.

Again, in identifying a nuclear tone (in this causes is falling) we disregard any prenuclear pitch pattern.

In a **rising** nuclear tone the pitch of the voice starts relatively low and then moves upwards. The starting point may be anywhere from low to mid, and the endpoint anywhere from mid to high.

If the nucleus is on the last or only syllable in the intonation phrase, then the rise takes place on the syllable.

Again, in identifying the nuclear tone we must disregard any prenuclear pitch pattern.

There is often a step down in pitch as we reach the beginning of the nuclear rise. Do not let this mislead you into thinking that the tone is falling.

If there is a tail (= syllables after the nucleus), the rising pitch movement does not happen whole on the nuclear syllable, as in the cause of a fall. Rather the rise is spread over the nuclear syllable and all the falling syllables – over the whole of the nucleus + tail.

This means that the last syllable is actually the highest pitched, even though it is unaccented. Some people find this difficult to perceive, and instead tend to hear the nucleus later in the intonation phrase than it really is. In fact, if there is no prenuclear material the nucleus, perceptually the most salient syllable for native speakers, is actually the lowest-pitched syllable in the IP.

In the **fall-rise** nuclear tone, the pitch of the voice starts relatively high and then moves first downwards and then upwards again. The starting point may be anywhere from mid to high, the midpoint is low, and the endpoint is usually mid.

If the nucleus is on the last or only syllables in the intonation phrase, then the entire fall-rise movement takes place on that syllable.

As usual, in identifying the nuclear tone we must disregard any pre-nuclear pitch pattern.

If there is a tail (= syllables after the nucleus), the falling-rising pitch movement is spread out over the nucleus and tail. The falling part takes place on the nuclear syllable, or between that syllable and the next. The rising part takes place towards the end of the tail and extends up to the last syllable of the IP.

SECTION SIX

Connected Speech

Aspects of Connected speech

Assimilation

6.1. Assimilation

Assimilation is a general term in phonetics for the process by which a speech sound becomes similar or identical to a neighboring sound. In the opposite process, dissimilation, sounds become less similar to one another. The term "assimilation" comes from the Latin meaning, "make similar to." "Assimilation is the influence of a sound on a neighboring sound so that the two become similar or the same. For example, the Latin prefix *in-* 'not, non-, un-' appears in English as *il-, im-.* and *ir-* in the words *illegal, immoral, impossible* (both *m* and *p* are bilabial consonants), and *irresponsible* as well as the unassimilated original form *in-* in *indecent* and *incompetent*. Although the assimilation of the *n* of *in-* to the following consonant in the preceding examples was inherited from Latin, English examples that would be considered native are also plentiful. In rapid speech native speakers of English tend to pronounce *ten bucks* as though it were written *tembucks*, and in anticipation of the voiceless *s* in *son* the final consonant of *his* in *his son* is not as fully voiced as the *s* in *his daughter*, where it clearly is [z]." (Zdenek Salzmann, "Language, Culture, and Society: An Introduction to Linguistic Anthropology. Westview," 2004)

"Features of adjacent sounds may combine so that one of the sounds may not be pronounced. The nasal feature of the *mn* combination in *hymn* results in the loss of /n/ in this word (progressive assimilation), but not in *hymnal*. Likewise, the alveolar (upper gum ridge) production of *nt* in a word such as *winter* may result in the loss of /t/ to produce a word that sounds like *winner*. However, the /t/ is pronounced in *wintry*." (Harold T. Edwards, "Applied Phonetics: The Sounds of American English." Cengage Learning, 2003). **Assimilation** then is a sound change in which some phonemes (typically consonants or vowels) change to become more similar to other nearby sounds. A common type of phonological process across languages, assimilation can occur either within a word or between words, i.e., in word-boundaries.

It occurs in normal speech but becomes more common in more rapid speech. In some cases, assimilation causes the sound spoken to differ from the normal pronunciation in isolation, such as the prefix *in-* of English *input* pronounced with phonetic [m] rather than [n]. In other cases, the change is accepted as canonical for that word or phrase, especially if it is recognized in standard spelling: *implant* pronounced with [m], composed historically of *in + plant*.

English "handbag" (canonically /ˈhændbæɡ/) is often pronounced /ˈhæmbæɡ/ in rapid speech because the [m] and [b] sounds are both bilabial consonants, and their places of articulation are similar. However, the sequence [d]-[b] has different places but similar manner of articulation (voiced stop) and is sometimes elided, which sometimes causes the canonical [n] phoneme to assimilate to [m] before the [b]. The pronunciations /ˈhænbæɡ/ or /ˈhændbæɡ/ are, however, common in normal speech.

In contrast, the word "cupboard", although it is historically a compound of "cup" /kʌp/ and "board" /bɔːrd/, is always pronounced /ˈkʌbərd/, never */ˈkʌpbɔːrd/, even in slow, highly-articulated speech.

6.1. Partial Assimilation and Total/Complete Assimilation

"[Assimilation] may be *partial* or *total*. In the phrase *ten bikes*, for example, the normal form in colloquial speech would be /tem baiks/, not /ten baiks/, which would sound somewhat 'careful.' In this case, the assimilation has been partial: the /n/ sound has fallen under the influence of the following /b/, and has adopted its bilabiality, becoming /m/. It has not, however, adopted its plosiveness. The phrase /teb baiks/ would be likely only if one had a severe cold! The assimilation is total in *ten mice* /tem mais/, where the /n/ sound is now identical with the /m/ which influenced it."

Johnston (2016: 40) explicates that there are special types of assimilation which are historical assimilation and contextual assimilation. Historical assimilation indicates the development of a language so that a word is now produced distinguishably than it was earlier. It is observable in the high amount of words that are articulated contradictorily to how they are written, as well as the presence of silent letters, for instances, handsome /hænsəm/, handkerchief /hæŋkəʧɪf/. As opposed, contextual assimilation refers to transformations in pronunciation because of the effect of surrounding words that it takes place in such instances as, horse shoe /hɔːʃ ʃuː/, whereby /s/ is substituted by /ʃ/; does she /dʌʒ ʃi/, whereby /z/ is substituted by /ʒ/ and don't you /dəʊnʧ juː/, whereby /t/ is substituted by /ʧ/.

6.2. Progressive assimilation vs. Regressive assimilation

Regressive assimilation(anticipatory assimilation) is an assimilation in which the sound that undergoes the change (the target) comes earlier in the word than the trigger of assimilation, i.e., the change operates backwards. Besides, Lorenz (2013:86) affirms that in English, regressive assimilation is frequent for syllable – final alveolar plosives and nasals [t, d, n]. For instance, the phrase good morning is /gʊd mɔːnɪŋ/ when it is articulated carefully. But in connected, everyday speech, /gʊb mɔːnɪŋ/ can be heard instead, where alveolar /d/ has been substituted by bilabial /b/ because of the following sound that is also bilabial. Similarly ten coins may not in fact be articulated as /ten kɔɪnz/, but rather as /teŋ kɔɪnz/ with a regressive assimilation of /n/ to /ŋ/.

In case of **progressive** assimilation the trigger comes before the target so that the assimilation operates forwards. In rare cases of *reciprocal assimilation* there is a mutual influence between the two sounds.Regressive assimilation is also called 'anticipatory assimilation' or 'right-to-left assimilation.' Progressive assimilation is also known as 'perseveratory assimilation' or 'left-to-right assimilation.' In other words, regressive assimilation **happens when the following sound in a word influences the preceding sound as in light** blue /laɪt blu:/ pronounced rapidly as /laɪp blu:/; whereas progressive assimilation happens when the preceding sound influences the following sound since the preceding sound is too dominant such as in the words: "handbag", which is often pronounced [ˈhamˈbag], and "hot potato" as [ˈhɒppəˈteɪtəʊ].

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