A CONCISE COURSE IN THEORETICAL PHONETICS

Edited by

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КОРОТКИЙ КУРС ЛЕКЦІЙ   З ТЕОРЕТИЧНОЇ ФОНЕТИКИ АНГЛІЙСЬКОЇ МОВИ

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У першій частині посібника подається типологічне зіставлення понять і одиниць мови і мовлення; окреслюються аспекти теоретичної фонетики – артикуляторний, акустичний, аудитивний, функціональний; проводиться розмежування фонетики і фонології. Наступні п'ять частин посібника присвячені розгляду сегментної і супрасегментної систем англійської мови. Коротко проаналізовані артикуляторні характеристики систем голосних і приголосних; теорія фонеми; характеристики складу як фонетичної / фонологічної одиниці; словесний наголос; просодичні підсистеми тону, наголосу у висловлюванні, ритмічна і темпоральна організація англійського мовлення, паузація.

Практичні завдання для засвоєння знань наведені у навчально-методичному посібнику "Теоретична фонетика англійської мови: семінарські заняття" (2019); дві публікації доповнюють одна одну і забезпечують базу, необхідну для оволодіння предметом.

Посібник призначається для студентів факультетів іноземних мов: спеціальності 035 Філологія, 035.041 Германські мови та літератури (переклад включно) (перша – англійська); 014 Середня освіта, 014.02 Середня освіта (англійська мова і література).

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1. PHONETICS

1.1 BASIC PERSPECTIVE

Phonetics studies oral speech – speech sounds and prosodic, or suprasegmental features (speech melody, stress and rhythm, tempo and pauses).

There are verbal and non-verbal ways of communicating meaning.

Verbal meaning is expressed through words, word combinations, utterances, and discourse. In oral speech, we use speech sounds – vowels and consonants, which are "building material" for syllables, words, utterances, and discourse. Syllables are the smallest units into which oral speech can be divided because sounds are not pronounced separately in connected speech.

The components of the **phonetic system of language** are:

- the system of segmental units – phonemes,
- the syllabic structure of words,
- word stress,
- prosodic features.

The two basic sections of phonetics are segmental phonetics and suprasegmental phonetics. **Segmental phonetics** studies speech sounds and phonemes (see the definition below). **Suprasegmental phonetics** studies speech features that extend over more than one segment – over syllables, word groups, utterances, stretches of discourse. These features are:

- **pitch movement**, also called speech melody or intonation;
- **loudness**;
- **tempo**.

They are factors in creating the effect of **stress** and **rhythm**. The effect of stress is caused by variations in loudness, pitch movement, and tempo. English rhythm is the result of regular recurrence of stressed syllables in stretches of speech. Another important phenomenon in oral speech is **pauses**. The use of all these elements in speech is referred to as **prosody**.

1.2 VERBAL COMMUNICATION AND VERBAL CODE

Communication is the transmission and reception of messages. The process involves at least two persons – a sender (addresser) and a receiver (addressee). Communication can be verbal and non-verbal. **Verbal communication** presupposes the use of language in oral or written form. **Non-verbal communication** has its own means:

- visualization (traffic signs, pictures, charts, diagrams, maps, logos, etc.);
- body language (sign language, facial expression, gestures, deaf-blind language, physical distance between people, etc.);
- prosody (the use of pitch, loudness, tempo, utterance stress, rhythm, pauses, specific timbre of voice);
- elements of other communication systems (light, numbers, flowers, colours, clothes, jewellery, scent, dance, sounds other than human voice such as drumming, whistle, music, etc.).

Language is a verbal code; it is a system of sounds, signs, written symbols used for communication. Its resources are lexicon (vocabulary), grammar, and phonology (the sound systems and the prosodic systems of languages).

Language is the conventional system of sounds, signs, or written symbols people use for communication and self-expression. **Speech** is planning and performing acts of speaking; oral speech is the oral medium of message transmission. Phonetics deals with the phenomena of oral speech.

1.3 THE UNITS OF LANGUAGE AND THE UNITS OF SPEECH

When speaking, people use various elements of the language system. **The units of language** are as follows (from the smallest to the largest one): · distinctive feature,

- phoneme,
- morpheme,
- word,
- phrase,
- sentence,
- text.

Distinctive feature is one of the constant, relevant features that help to distinguish one phoneme from all other phonemes in a language.

Phoneme is the smallest unit of language that makes one word different from another (*pay – day – jay – may – say – way*, etc.).

Morpheme is the smallest unit of language that has meaning of its own; words consist of morphemes.

Word is the smallest unit of language that can stand alone – people understand words even when they are taken out of context.

Phrase is a combination of words smaller than a clause (a clause is a group of words that contains a subject and a predicate; a clause is a part of a compound or complex sentence).

Sentence is a group of words that contains a subject and a predicate, and expresses a complete thought.

Text is a stretch of spoken or written language with a concrete communicative function (a report, a story, a sermon, etc.).

The units of speech are as follows (from the smallest to the largest one):
- articulatory feature,
- sound (segment),
- syllable,
- rhythmic unit,
- tone group,
- utterance,
- discourse.

Articulatory features are positions and movements of vocal organs in the production of a particular sound; for example, the lips may be stretched or rounded, the tongue may be raised or lowered, the vocal folds may vibrate or not, etc.

Sound is the smallest segment of speech.

Syllable is a unit larger than a single segment (sound) and smaller than a word. From a phonetic perspective, the syllable is the smallest articulatory and perceptible unit in connected speech. For example, *fac·ul·ty, gig·a·byte, won·der·ful.* Pitch, loudness, and tempo can make a specific effect of prominence in one or two syllables in a word. Such prominence is usually referred to as word stress. A stressed syllable in English is perceived as having a greater length, a greater degree of loudness; it is marked by a higher pitch;
sounds in a stressed syllable are pronounced more clearly than sounds in other (unstressed) syllables.

In speech, syllables are elements of larger prosodic units – **rhythmic units**.

There are several types of rhythmic units: (A) one stressed syllable, (B) a stressed syllable followed by some unstressed ones, (C) a stressed syllable with a number of unstressed ones grouped around it (the initial rhythmic unit in a tone group).

For example,

`Yes (**one rhythmic unit**)

One can 'never be `sure (**two rhythmic units**)

Rh. un. 1   Rh. un. 2

She is the 'best 'student in my `year (**three rhythmic units**)

Rh. un. 1   Rh. un. 2   Rh. un. 3

Rhythmic units make up tone groups. **Tone group** is a sense group. In speech continuum, each tone group has a particular tone (specific intonation contour). Tone groups' boundaries are marked by pauses.

For example, **three rhythmic units, two tone groups:**

I'll `help you | no 'matter `what

Rh. un. 1   Rh. un. 2   Rh. un. 3

Tone gr.1   Tone gr. 2

If one syllable expresses a complete thought, it can form a tone group alone; for example, tone groups A1 and B1 in the following dialogue:

A: ˌTea? **B:** `No || `thank you ||

Tone gr. Tone gr.   Tone gr.
 A1   B1   B2

Utterance is an oral "version" of a sentence, a stretch of speech which is not associated with grammar theory.

Discourse is a stretch of speech larger than a sentence, a complex communicative event.

1.4 THE ASPECTS OF SOUND PHENOMENA. THE BRANCHES OF PHONETICS

Phonetics studies the following aspects of human speech: (a) the production, (b) transmission, and (c) reception of speech sounds; it also (d) makes generalizations about the systems of sounds and prosodic features in a language and their role in expressing meaning.

The **aspects of sound phenomena** are as follows:
- the articulatory aspect (sound production),
- the acoustic aspect (the physical properties of speech sounds),
- the auditory aspect (the perception of speech sounds),
- the linguistic aspect (the linguistic functions of sounds and prosodic features).

The corresponding **branches of phonetics** are as follows:
- articulatory phonetics,
- acoustic phonetics,
- auditory phonetics,
- functional phonetics (phonology).

ARTICULATORY PHONETICS deals with the ways we use the vocal organs to produce speech sounds. It studies respiration (the process of breathing), phonation (the production of voice), articulation (coordinated movements of the vocal organs in the production of speech sounds). For each sound, the vocal folds vibrate in a specific way or are held apart, the position of the vocal organs is changed and their movements are different. It means that the shape, the size, and the volume of the oral and nasal cavities are changed. As a result, we produce different speech sounds.

ACOUSTIC PHONETICS studies the physical features of speech sounds: frequency, intensity, duration, spectrum.

Sound waves

Sound results from vibrations of different objects such as motors, strings in musical instruments, bells, tuning forks, vocal folds, etc. Their vibrations make the particles of air oscillate (move to and fro). The movement causes a chain reaction in adjacent particles of air. In this way, sound waves are produced. Speech sounds are produced by the movements and vibrations of the **vocal organs**, **vocal folds** in particular. Sound waves are transmitted through the air, the listener hears and interprets them.

If the pattern of vibration is repeated at the same rate, we hear a **pure (single) tone** (like that produced by a tuning fork).The shape of such waves is sinusoidal; they are called **sine waves**.
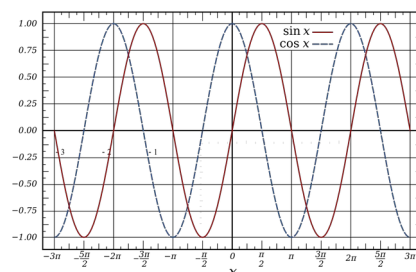
(Sine wave, 2020)

But speech waves are more complex. The vocal folds simultaneously produce different kinds of vibrations. The vibrations over the whole length of the vocal folds are called **basic vibrations**. They produce the **fundamental tone**. Parts of the vocal folds vibrate simultaneously with their whole length. These simultaneous vibrations generate other tones that are called **overtones**, or **harmonics**. The combination of the fundamental tone and overtones results in a **complex tone**.
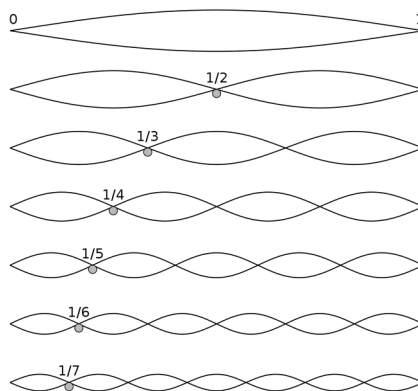
(Overtone, 2020)

Complex tones are an inherent component of

➢ vowels, sonants, voiced consonants;

➢ speech melody.

Voiceless consonants are pure noises; the vocal folds do not vibrate.

Sound waves are generated not only by the vibrations of the vocal folds. Their production is influenced by

➢ movements of other vocal organs – the tongue, the soft palate, the lips;

➢ properties of the vocal tract – pharynx, the oral and nasal cavities. When speaking, a person changes the shape of the vocal tract, which results in the production of different sounds.

There are periodic and aperiodic patterns of vibration. If the waveform pattern is regular and repeats itself, the vibrations are **periodic**. The sound waves of voiced sounds – vowels and nasals – are periodic. Random vibrations – those

that have no regular repeating pattern – are **aperiodic**. Voiceless fricatives, such as /s/, /f/, etc., are aperiodic speech sounds.

periodic (pitch)   aperiodic (noise)
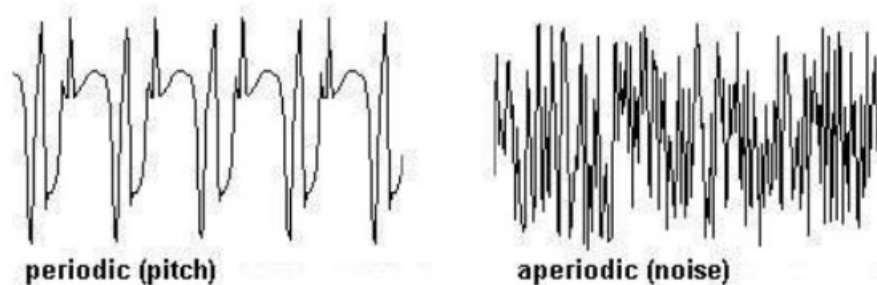
(Kreidler, 2009, ch. 3)

Frequency

The number of vibrations per second is called the **frequency** of a sound. Frequency is measured in hertz (Hz). The **basic vibrations** of the vocal folds are the **fundamental frequency**, or the fundamental (F_0). The fundamental frequency is lower than the frequencies of overtones.

There is a correlation between the frequency of a pure tone (an acoustic feature) and pitch (perceptible, auditory feature): the higher the frequency, the higher is the perceived pitch level of a sound. But what the human ear perceives as pitch is the result of several factors – frequency, duration, and intensity – working together.

Intensity

Intensity of a speech sound depends on the amplitude of the wave: a greater amplitude results in a greater intensity of a sound. **Amplitude** is the maximum distance an air particle moves in each direction from its rest point.
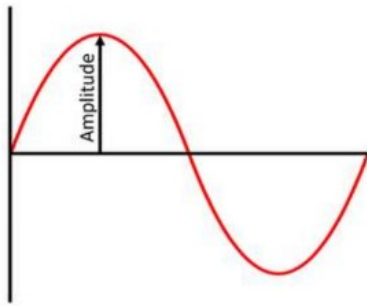
(Amplitude, 2020)

Intensity is measured in decibels (dB). The reference level (SLP – sound pressure level) for measuring intensity is **the threshold of audibility**, the point at which the human ear starts hearing a sound. See the following examples:

> ➤ the threshold of audibility (the softest sounds) 0 dB
> ➤ whisper about 30 dB
> ➤ normal conversation about 60 dB
> ➤ motorcycle about 95 dB
> ➤ a very loud radio or a rock concert 105–110 dB
> ➤ noise above 120 dB causes pain and hearing loss

(Centers for Disease Control and Prevention, 2019)

What we perceive as loudness depends on a number of acoustic features: the amplitude of vibration, frequency, and duration of sounds.

Duration

Duration is the length of a sound, the time during which vibrations last. It is measured in milliseconds (ms).

Spectrum

Spectrum is the range of frequencies of a sound. Within the spectrum of a sound, some frequencies have greater amplitude than others. These intensifies frequencies are peaks of acoustic energy. They are called **formants**.

Vowels usually have three formants – F1, F2, and F3; each next formant has a higher frequency than the previous one. Each vowel has a formant pattern of its own. Sonants are also characterized by formants. Voiced plosives, voiced fricatives, and voiced affricates "are characterized by a combination of intervals of noise, silence, and changing formant transitions". Voiceless consonants don't have formants (Acoustic Structure of Consonants, n.d.).

For more detailed information see REFERENCES:

- ➢ Crystal, 2003 b, pp. 132–137;
- ➢ Wolfe et al., 2020;
- ➢ Theory of voice production: Vocal attributes: Frequency, harmonic structure, and intensity, 2021;
- ➢ All About Linguistics, n.d. Acoustic Phonetics.

AUDITORY PHONETICS studies the ways people perceive speech sounds. A sound wave passes along the external auditory canal of the human ear and reaches the eardrum. In the ear, vibrations of the air are transformed into nervous stimuli and transmitted to the brain. It is a very complex physiological and psychological process, and the features of sounds we perceive (auditory features) do not fully correspond to the acoustic properties; yet the **basic correlations** may be presented like this:

BASIC CORRELATIONS BETWEEN THE ACOUSTIC AND AUDITORY ASPECTS OF SPEECH SOUNDS	
ACOUSTIC PROPERTIES	AUDITORY FEATURES
fundamental frequency	pitch
formant frequencies	quality (timbre)
intensity	loudness
duration	length

We perceive the fundamental frequency as the pitch of voice – the greater is the frequency, the higher is the pitch. But the intensity of a sound may also change our perception of its pitch – the lower is the intensity, the higher is the perceived pitch.

Intensity is perceived as a certain degree of loudness – the greater is the intensity of a sound, the louder is the sound. But the degree of loudness may also depend on its pitch and length. A sound is perceived as louder

➢ if its pitch is higher than that of neighbouring sounds;
➢ if it is longer than neighbouring sounds.

Duration of speech sounds is perceived as their length. But our perception of length does not always agree with the physical duration of speech sounds or other speech units. For example, the length of rhythmic units in a tone group/utterance is usually perceived as the same. But machine analysis shows that their duration is actually different.

FUNCTIONAL PHONETICS (PHONOLOGY) studies the systems of segmental units (phonemes) and suprasegmental, or prosodic, units (prosodemes, intonemes). Their function is to distinguish one word or one utterance from another; for example, *bad* from *bed*; *I want a blue HAT* (not a jacket) from *I want a BLUE hat* (not a black one).

The area of phonology that studies the distribution and grouping of phonemes in syllables and words in a language is called **phonotactics**.

1.5 PHONETICS AND PHONOLOGY

Phonetics is a branch of linguistics. In a broad sense, it studies the sound phenomena of language: segmental sounds (vowels and consonants) and how sounds organize themselves into the units of spoken language; it also studies prosodic phenomena (speech melody, stress, tempo, rhythm, pauses). Phonetics

studies the production of speech sounds, their transmission through the air, and their reception by listeners.

Phonetics studies **all possible sounds** humans produce. Human vocal organs can produce a great variety of sounds. In speech, sounds that belong to the same type are modified depending on their position in a word and the nature of neighbouring sounds; besides, different individuals pronounce the same sounds a bit differently. Despite such variations, we can recognize this or that sound as belonging to a particular type. Consider, for example, such words as *pay – day – may – say – way*. There may be differences in the way they are pronounced by different speakers. But such variations in sound production do not change the words' meanings. We get the meanings of these words because we perceive the properties of /p/, /d/, /m/, /s/, /w/ that make them different from one another. We know that /p/, /d/, /m/, /s/, /w/ are different types of sounds because they make differences in the meanings of the words. Such **types of sounds** are called **phonemes**.

Sounds are the units of speech. Phonemes are the units of language, they belong to the language system. The branch of phonetics that studies the sound system of language and the system of prosodic features (speech melody, stress, tempo, rhythm, pauses) that can change the meaning of a word or an utteranceis called **phonology**.

For example, *I want a blue HAT* is different from *I want a BLUE hat* because we change the position of so-called nucleus (in these utterances, *HAT* and *BLUE*). The nucleus is a stressed syllable in the word which is the most important one for a speaker in a given situation. It is marked by a kinetic – falling, rising, falling-rising, rising-falling – tone. So the prosodic features of the nucleus are falling/rising tone (speech melody), stress, and change in tempo (the nuclear syllable is pronounced a bit slower than other syllables).

2. ARTICULATORY ASPECT OF SPEECH SOUNDS

2.1 SPEECH SOUNDS: THE PRINCIPLES OF CLASSIFICATION

The two basic types of speech sounds are vowels and consonants. There also is a specific class of sounds called sonants; they have the properties of both vowels and consonants.

The articulatory principles of classification of speech sounds are:
the presence/absence of obstruction, the distribution of muscular tension, the force of air stream.

The articulatory features of **vowels**:

- vowels are based on voice,
- there is no obstruction in their articulation,
- muscular tension is evenly spread throughout the vocal organs,
- the force of air stream is weak.

The articulatory features of **consonants**:

- there is an obstruction in the articulation of consonants; its removal causes noise – plosion or friction,
- tension is concentrated at the place of obstruction,
- the force of air stream is strong.

The articulatory features of **sonants** (/m/, /n/, /ŋ/, /l/, /r/, /w/, /j/):

- there is an obstruction in the articulation of sonants,
- muscular tension is concentrated at the place of obstruction,
- sonants are based on voice,
- the force of air stream is weak.

2.2 ARTICULATORY FEATURES OF ENGLISH VOWELS

2.2.1 Types of **vowels**, movements of the tongue and lips, length

See FERENCES:

➢ Crystal, 2003 a, pp. 237, 238 240, 241;

➢ icSpeech. English Vowel Sounds. https://icspeech.com/vowel-sounds.html;

   and

➢ Appendices A and B.

2.2.2 **Monophthongs** and **diphthongs**

According to the stability of articulation, English vowels are divided into monophthongs (pure vowels) and diphthongs. Diphthongs have two elements: nucleus and glide. The quality of the sound changes as the tongue moves (glides) from one position to another. For classification of diphthongs see REFERENCES:

➢ Crystal, 2003 a, pp. 237–239;

    and

➢ Appendix C.

2.2.3 **Triphthongs**

See REFERENCES:

➢ Crystal, 2003 a, p. 239.

2.3 ARTICULATORY FEATURES OF ENGLISH CONSONANTS

The **types of obstruction** and the **type of noise** in the articulation of consonants:

- complete occlusion (closure) of the vocal tract; the air escapes with plosion;

- constriction (narrowing) in the vocal tract creates the effect of friction;

- occlusion-constriction – a complete obstruction is released and the air

escapes from the mouth with audible friction.

Consonants: articulation (place and manner), voiced/voiceless consonants, fortis/lenis consonants, use of the nasal cavity.

See REFERENCES:

➢ Crystal, 2003 a, pp. 242, 243;

➢ icSpeech. English Consonant Sounds. https://icspeech.com/consonant-sounds.html ;

and

➢ Appendices D and E.

Sonants: consonants or vowels?

See REFERENCES:

➢ Crystal, 2003 a, p. 242.

3. FUNCTIONAL ASPECT OF SPEECH SOUNDS

3.1 THE PHONEME

In connected speech, sounds are modified. Their features are influenced by neighbouring sounds, their position in a word, utterance stress, speech melody, and tempo of speech; for example, /p/ is aspirated in *pan* and non-aspirated in *span*.

But in any position, the relevant (most important) features of a sound do not change. These relevant features are responsible for the quality of a **sound type**. For example, /p/ is different from /d/, /g/, /m/, that is why we perceive *pie, dye, guy, my* as different words. Such types of sounds are called phonemes. The **phoneme** is the smallest linguistically relevant unit of language. Its main function is to distinguish between words.

Phonemes are also defined as **bundles of distinctive features**. For the number of English phonemes and their distinctive features see Appendices A – E.

The phoneme is an abstraction and a generalization. Yet it is material because it is represented by concrete sounds in speech.

In speech, variants of the same phoneme (speech sounds) are called allophones. An **allophone** is "one of the ways in which a particular phoneme can be pronounced" (Cambridge Dictionary, 2021). Allophones have the **relevant features** of the phoneme (features that make one phoneme different from another, thus changing the meaning; for example, *bike – pike, beak - back*) and some irrelevant (redundant) features. **Irrelevant features** depend on the position of an allophone in a word (initial, final, medial) and its phonetic environment (surrounding sounds). For example, /p/, /t/, /k/ are aspirated at the beginning of words (*pay, tell, keen*); they may be aspirated or non-aspirated at the end of certain consonants (*plum, store, close*). Another example: the same vowel is pronounced a bit longer before a voiced consonant (as /æ/ in *mad*) and a bit shorter before a voiceless one (as /æ/ in *mat*). Allophones do not distinguish between words because they are variants of the same phoneme.

Allophones may occur in complementary distribution or in free variation. Allophones are **in complementary distribution** if they never appear in the same environment (position). For example,

> ➢ voiceless allophone /l/ occurs after a voiceless consonant (as in *play*);
> ➢ the so called clear /l/, articulated with the blade of the tongue and the alveolar ridge, occurs before vowels (as in *lily*) and before /j/ (as in *will you*);
> ➢ the so called dark /l/, articulated with the slightly raised back part of the tongue, occurs before a consonant or after a vowel (as in *help, fall*).

<div align="center">(Bittner, 2013; Kuiper & Allan, 2016, pp. 167–168)</div>

Allophones **in free variation** may appear in the same environment (position) without changing the meaning of the word. For example, a speaker may choose to explode or not to explode the final /t/ in the word *cat*; the two sounds are allophones of the same phoneme in free variation (Cruttenden, 2014, p. 46).

3.2 PHONEMES IN CONNECTED SPEECH

English vowels and consonants are modified in connected speech:

Reduction. In unstressed syllables, the articulation of English vowels is weakened and the duration is shortened. Vowels are partially reduced (for example, *so late* [so ˋleɪt], where /əʊ/ may be pronounced as [o] or reduced to /ə/: *Not so late* [ˈnɒt sə ˋleɪt]; *from Brazil*, where /frɒm/ may be pronounced as [frəm].

Elision (delition). In rapid or careless speech, sounds may be left out. Most typically, consonants /t/ and /d/ are dropped if they are a part of a consonant cluster; for example, in such words and phrases as *kindness, next day, want to go (wanna go), don't know (dunno).* Weak vowel /ə/ may also be dropped; for example, in *can, slacken, fool about, fire alarm.*

Liason. A sound may be introduced between words to link them. In Received Pronunciation ("a widely recognized accent of British English, associated with education, broadcasting and the South of England", (Oxford Learner's Dictionaries, n.d.)), the final r is usually not pronounced; for example, *father* /ˈfɑːðə/, *summer* /ˈsʌmə/. But if the next word begins with a vowel, /r/ is used to

link the words; for example, *summer and autumn* /ˈsʌmər ənd ˈɔːtəm/. Intrussive /r/ may appear between two vowels even if there is no r at the end of the first word; for example,g. *America(r) and Asia, formula(r) of success.*

Accomodation. It is adapting the articulation of a consonant to a neighbouring vowel (e.g., /ʃ/ in *shoe* is labialized under the influence of the rounded /uː/) and the articulation of a vowel to a neighbouring consonant (e.g., /e/ in *men* is nasalized).

Assimilation. In a consonant cluster, a consonant is partially or fully assimilated by a neighbouring consonant.

Partial assimilation means that a consonant loses some of its features and acquires some features of another consonant. For example, in *ten bikes*, /n/ becomes bilabial under the influence of /b/ and the word combination may sound as /tem baɪks/.

Full assimilation means that a consonant takes the form of a neighbouring consonant. For example, /s/ in *horseshoe* may be pronounced as /ʃ/ under the influence of the following consonant – /ˈhɔːʃʃuː/.

According to the criterion of direction, there are three main kinds of assimilation:

  ➢ **regressive assimilation**, which means that a consonant is changed under the influence of the following sound; for example, *in ←May* /ɪm meɪ/, *let ←me* /lem: iː/; in *play* /p/ loses its plosion under the influence of /l/;

  ➢ **progressive assimilation**, which means that a consonant is influenced by a preceding sound; for example, *lunch→ score* /lʌntʃ ʃkɔː/; compare *it's* /ɪts/ to *it is* /ɪt ɪz/ – in *it's* /z/ becomes voiceless and sounds like /s/ under the

influence of the preceding /t/;

> **coalescent (reciprocal) assimilation**, which means that neighbouring sounds influence each other; for example,

won't you /wəʊnt ju/ → /wəʊntʃu/,

would you /wʊd ju/ → /wʊdʒu/,

miss you /mɪs ju/ →/mɪʃu/,

lose you /luːz ju/→/luːʒu/.

3.3 DISTINCTIVE FEATURES OF THE PHONEME

Distinctive features of a phoneme are features that make a difference between two (or more) phonemes. As a result, there is a difference in meaning between two (or more) words.

For example, /s/ and /z/ have several features in common:

> according to the type of obstruction and the manner of production of noise, they are constrictives;
> according to the active speech organ and the place of obstruction, they are lingual, forelingual, alveolar (see Appendices D and E).

The only feature that makes them different is the presence/absence of voice: /z/ is voiced and /s/ is voiceless. This distinctive feature makes a difference in meaning: *lose – loose*.

Similarly, both /eɪ/ and /aɪ/ are closing diphthongs with the glide towards the high (close) vowel /ɪ/ (see Appendix C). But they have different types of nucleus. This distinctive feature accounts for the difference in meaning between *day* and *dye.*

Distinctive features are also called relevant features. They are responsible for the difference between phonemes and the difference in the meaning of words. Each

phoneme has a set of relevant features (that is why a phoneme is sometimes defined as a bundle of relevant features). Allophones of the same phoneme have its relevant features and some irrelevant ones. Irrelevant features do not change the meaning of the word. For example, /p/, /t/, /k/ can be aspirated or non aspirated at the end of a word, but it does not make any difference in meaning.

To discover distinctive features of a phoneme, it has to be opposed to another phoneme in the same phonetic environment. In other words, we have to look for

words in which the change of one phoneme causes the change in meaning; for example, *collect – correct, vine – wine, loot – lot, ship – sheep*. They are called **minimal pairs**. Such oppositions help to establish the number of phonemes in a language.

The types of oppositions in the system of English vowels:
- monophthongs between themselves,
- diphthongs between themselves,
- monophthongs vs. diphthongs.

    The types of oppositions in the system of English consonants:
- based on the force of articulation: fortis vs. lenis consonants (*two – do*),
- based on the active speech organ; for example, bilabial vs. forelingual consonants (*bet – let*),
- based on the type of obstruction; for example, plosives vs. sonants (*pen – men*).

3.4 TRANSCRIPTION

Transcription is a method of visual representation of speech sounds. **Phonemic (broad) transcription** represents the phonemes of the language; it has a particular symbol for each phoneme, focusing on distinctive features of a phoneme and disregarding its possible modifications in speech. Phonemic

transcription does not distinguish between allophones. The phonemic symbols are enclosed in slashes, e.g., /t/. **Phonetic (narrow) transcription** seeks to describe specific characteristics of allophones in utterances. The symbols are enclosed in square brackets, e.g., [t]. The problem with phonetic transcription is that a different symbol, and sometimes a diacritic mark, should be provided for each allophone.

4. THE SYLLABLE

4.1. BASIC PERSPECTIVE

Syllables are the smallest units in speech continuum. The syllable is a **phonetic unit**: it has articulatory, auditory, and acoustic features, which is true for all languages.

It is the smallest articulatory unit: in connected speech, sounds are not pronounced separately, articulatory tension increases at the beginning of a syllable, and decreases at its end. The syllable is the smallest auditory (perceptible) unit: in speech, it is easier to recognize a syllable than to separate sounds of which it consists. The acoustic features of the syllable are fundamental frequency, intensity, duration, and spectrum modulation.

The syllable is also a **phonological unit** because each language has its own rules of combining phonemes into syllables. In English, the nucleus of the syllable is a vowel (or one of the syllabic sonants – /m/, /n/, /l/). It may be preceded and followed by a consonant or a permissible combination of consonants.

For example, in English, "formations such as … *kopf*, … *glanb, fodg* are not allowable as they may be in other languages", while /fθ/ as in *fifth*, /ŋd/ as in *ringed* , /mt/ as in *dreamt* are permissible clusters in the final position of a word (ELT Concourse Teacher Training, n.d.).

4.2 THEORIES OF SYLLABLE FORMATION

- the expiratory theory
- the prominence theory
- the muscular tension theory

According to the **expiratory (chest pulse) theory** (R.H. Stetson), a syllable is pronounced in one chest pulse, the number of syllables in an utterance depends on the number of expirations. Though, later researches proved that we do not need a chest pulse for each syllable we pronounce.

The **prominence (relative sonority) theory** (E. Sievers and O. Jespersen) argues that sounds have different degrees of sonority. Sonority is the perceptibility or distinctness of speech sounds (Merriam-Webster, 2021). There are as many syllables in a word as there are peaks of prominence (sounds with the greatest degree of sonority) in it. Vowels are the most sonorous sounds, sonants are less sonorous. The least sonorous sounds are consonants – fricatives have greater degree of sonority than plosives; voiced consonants have greater degree of sonority than voiceless ones. One peak of prominence is separated from another by a sound (sounds) with lower sonority. Influential as it is, this theory cannot explain all the cases of syllable division, for example, to which syllable the less sonorous sound belongs: /ˈe.kstrə/ – /ˈek.strə/ – /ˈeks.trə/ (Rogerson-Revell, 2011, p. 116).

The **muscular tension theory** (L. Shcherba) is another attempt to explain the process of syllable formation and syllable division. According to it, a syllable is an arc of muscular tension: the articulatory energy increases at the beginning of the syllable, it is maximal with the vowel (or a syllabic sonant), then it starts to decrease, and the end of the syllable has minimal muscular tension. This theory is relevant to the articulatory and auditory levels, while the acoustics level is not taken into account (Корунець, 2004, p. 71).

4.3 THE STRUCTURE OF THE ENGLISH SYLLABLE

The **nucleus of the syllable** is a syllabic sound – a vowel or one of the vocalic (syllabic) consonants: /m/, /n/, /l/, and /r/ in the American pronunciation of some words. For example,

➢ /m/ as in *prism* /ˈprɪz.m/,

➢ /n/ as in *cotton* /ˈkɒt.n/,

➢ /l/ as in *parcel* /ˈpɑː.sl/,

➢ /r/ in American English as in *perhaps* /prˈhæps/.

The vocalic consonants form the peak of a syllable only if they are separated from a vowel by another consonant. For example, in *pencil* /ˈpen.sl/, /e/ is the peak of the first syllable and /l/, of the second one; /n/ is not the peak of the syllable because it stands immediately after the vowel.

The central part of the syllable is its nucleus (peak). The **onset** is the non syllabic element preceding the nucleus. The **coda** is the part of the syllable that follows the nucleus.

For example, *complain* /kəmˈpleɪn/ has two syllables:
syllable 1: /k/ is the onset;

/ə/ is the nucleus;

/m/ is the coda;

syllable 2: /pl/ is the onset;

/eɪ/ is the nucleus;

/n/ is the coda.

The **syllable types** are as follows (V stands for vowels and C, for consonants):

- V – as in *I, or, oh, er* (*er* a sound uttered when a speaker makes a pause in the middle of an utterance to decide what to say next);

- C – very seldom – *m, shh*;
- CV – the so called open syllables; for example, *bee, go, two*;
- VC – the so called closed syllables; for example, *add, eat, axe*;
- CVC – as in *good, clap, choice.*

<div align="center">(Crystal, 2003, p. 246)</div>

Words may be monosyllabic (*go, eight, tell*) and polysyllabic, containing more than one syllable (*student, memory, telephone*); words containing two syllables are sometimes called disyllabic (*summer, neighbour, freezer*). In English, there may be up to three consonants in the onset (*stream* /striːm/) and up to four consonants in the coda (*glimpsed* /glɪmpst/, *sixths* /sɪksθs/ as in *five sixths of*).

4.4 SYLLABIFICATION

Syllabification is dividing words into syllables. Rules of syllable formation are called **phonotactic constraints**. They are rules concerning consonant sequences that are permissible in the onset and the coda of the syllable in a particular language. For example, in English, the nt, ng sequences are possible at the end of a syllable (*ant, student, spring, coming*), but not possible at the beginning. Dividing English words into phonetic syllables, we should avoid creating consonant sequences which are not found at the beginning and/or at the end of separate words.

For example,   *language* is divided as /ˈlæŋ.gwɪdʒ/, not /ˈlæŋg.wɪdʒ/;

sandy, as /ˈsæn.dɪ/, not /ˈsæ.ndɪ/;

somber, as /ˈsɒm.bər/, not /ˈsɒ.mbər/.

According to J. C. Wells (1990) the basic rules of phonetic syllabification are as follows:

- consonants that come between two vowels belong to the syllable which is more strongly stressed; for example, *American* /əˈmer.ɪ.kən/, *busy* /ˈbɪz.i/,

mahogany /məˈhɒg.n.i/;

- syllable boundaries coincide with word boundaries;
- in polymorphemic words (made up of more than one morpheme: the root morpheme, suffixes and prefixes), syllable structure corresponds to the morpheme structure; for example, *Roman* /ˈrəʊm.ən/, *bigger* /ˈbɪg.ə/, *coming* /ˈkʌm.ɪŋ/, *boxes* /ˈbɒks.ɪz/;
- phonotactic constraints on syllable structure (see above) must be observed;
- affricates /tr/, /dr/, /tʃ/, /dʒ/ should not be split between syllables; for example, *factory* /ˈfæk.tr.i/, *cylindrical* /sɪˈlɪn.drɪ.kl/, *kitchen* /ˈkɪtʃ.n/, *magic* /ˈmædʒ.ɪk/.

NB

There is a difference between the **syllable as a phonetic/phonological unit** and the **orthographic syllable**. The structure of the orthographic syllable does not necessarily coincide with the structure of syllable in speech. It means that dividing words into syllables in writing may be different from syllabification in speech. If a word has to be split across two lines in writing, we should place a hyphen between two orthographic syllables, but the phonetic syllabification may be different.

For example,   *syllable:* syl-la-ble /ˈsɪl.ə.bl/;

factory: fac-to-ry /ˈfæk.tr.i/.

4.5 FUNCTIONS OF THE SYLLABLE

A single syllable may constitute a word; it can join other syllables forming longer words, rhythmic units, utterances. In English, syllables can distinguish words and word combinations; for example, *ice cream – I scream, a name – an aim, a nice man – an ice man.* Together with stress, syllables indicate relative importance of words in a tone group or an utterance, thus being a factor in creating meaning; for example, *Doris baked apple CRUMble*; *DOris baked apple crumble*.

5. ENGLISH WORD STRESS

5.1 THE NATURE OF ENGLISH WORD STRESS

Accentual (stress) pattern is a component of the phonetic structure of the word.

In a word, syllables have different degrees of prominence. The correlation between the degrees of prominence is called the **accentual (stress) pattern** of the word. There may be one prominent syllable, two or three prominent syllables in a word. For example, *September* /sepˈtem.bə/);

examination /ɪɡˌzæm.ɪˈneɪ.ʃn/;

unreliability /ˈʌn.rɪˌlaɪ.əˈbɪl.ə.ti/.

Accentual patterns help to understand words' meanings (Crystal, 2003 a, p. 248). Monosyllabic words have no accentual pattern – there is nothing with which to compare the degree of prominence if a word has only one syllable. But as lexical items, these words are regarded as stressed: when pronounced in isolation, they are said with primary stress.

In terms of production (the articulatory level), the effect of prominence is achieved through greater muscular activity of the vocal organs. What we perceive as stress (the auditory level) is a combination of a greater degree of loudness, a greater length of a stressed syllable, and modifications in pitch and quality. The acoustic parameters responsible for the effect of stress are variations in intensity, duration, frequency, and formant structure. The degree of prominence depends on the quality of a vowel. Open vowels are the most sonorous ones. The syllables that contain open vowels are usually perceived as stressed.

5.2 LINGUISTICALLY RELEVANT DEGREES OF WORD STRESS

According to D. Jones, all syllables in a polysyllabic word have a certain degree of prominence. For example, there are five syllables in   the word *opportunity*

/ˌɒp.əˈtʃuː.nə.ti/. The third syllable is the most prominent one. The first syllable is a less prominent. The fifth syllable is still less prominent. The degree of prominence in the second syllable is still lesser. The least prominent syllable is the fourth one (Jones, 1922, p. 111).

Not all degrees of prominence are **linguistically relevant:** not all of them are important for establishing the accentual pattern of the word, not all of them help the listener to recognize the word and understand its meaning. Usually, four degrees of word stress are distinguished: primary, secondary, tertiary, and zero stress:

- primary stress is a prominent rhythmic beat;

e.g., *experimental* /ɪkˌsper.ɪˈ**men**.təl/;

- secondary stress is a less prominent rhythmic beat;

e.g., *experimental* /ɪkˌ**sper**.ɪˈmen.təl/;

- tertiary rhythmically non-prominent stress, or minor stress; there is no reduction of vowels or weakening of consonants in syllables that carry tertiary stress; e.g., *experimental* /ɪkˌsper.**ɪ**ˈmen.təl/;

- zero stress – found in syllables that contain reduced vowels and weakened consonants; e.g, *experimental* /ɪkˌsper.ɪˈmen.**təl**/.

5.3 THE ACCENTUAL PATTERNS OF ENGLISH WORDS

English word stress is mainly regular – the accentual patterns of a great number of English words are stable. Compare, for example, the English and Ukrainian words: *lazy* /ˈleɪ.zi/ – *laziness* /ˈleɪ.zi.nəs/; *лінúвий – лíнощі.* On the other hand, English word stress is believed to be free because it is not restricted to one position (the initial or the last syllable) in all words.

Issues for self-study

- stress in two-, three-, and four-syllable words, words with prefixes and suffixes;

- stress in compound words/phrases (late stress, early stress); · types of compounds with early and late stress;
- stress patterns of compound adjectives.

See REFERENCES:

➢   Паращук, 2005, pp. 177–181.

5.4 THE ACCENTUAL TENDENCIES IN ENGLISH

The recessive tendency. The stress falls on the root syllable. It is either the first (*father, mother, brother*) or the second syllable in words with prefixes of no particular meaning (*behind, indeed, among*). The tendency is observed in both native English words and those borrowed from other languages (*marriage, reason*). The tendency is called recessive because accent "works backwards to the root" (The Atlantic Monthly, 1895, p. 415).

The rhythmic tendency. This tendency was caused by the alternation of stressed and unstressed monosyllabic words in English utterances.

In many three- and four-syllable English words the stress falls on the third syllable from the end (*identity* /aɪˈden.tə.ti/, *policy* /ˈpɒl.ə.si/, *tendency* /ˈten.dən.si/).

If a word has more than four syllables, the recessive and the rhythmic tendencies may work together (*cinematography* /ˌsɪn.ə.məˈtɒg.rə.fi/, *spirituality* /ˌspɪr.ɪ.tʃu ˈæl.ə.ti/, *indivisible* /ˌɪn.dɪˈvɪz.ə.bl/).

The retentive tendency. A derivative – a word formed from another word or base (Merriam-Webster, 2021) – may retain the stress of its parent word. For example,   *person* /ˈpɜː.sn/ – *personal* /ˈpɜː.sn.l/ (primary stress);

person /ˈpɜː.sn/ – *personality* /ˌpɜː.snˈæl.ə.ti/ (secondary stress).

Stressing important parts of words:

➢ negative prefixes (*unknown* /ˌʌnˈnəʊn/, *misbehave* /ˌmɪs.bɪˈheɪv/);

➢ prefixes *ex-, vice-, sub-, under-*; (*vice-president* /ˌvaɪs ˈprez.ɪ.dənt/, *undermine* /ˌʌn.dəˈmaɪn/);

➢ suffix *-teen* (*eighteen* /ˌeɪˈtiːn/);

➢ both parts of compounds that are considered to be equally important; (*well-known* /ˌwelˈnəʊn/, *bad-mannered* /ˌbædˈmæn.əd/).

5.5 THE FUNCTIONS OF WORD STRESS

To explain the basic functions of word stress, see REFERENCES:

➢ Hancock (2012, pp. 64, 66, 68, 72, 76).

6. THE PROSODIC SYSTEM OF ENGLISH

6.1 PROSODY AND INTONATION

Prosody is a unity of suprasegmental features: speech melody (pitch), utterance stress, tempo, rhythm, pauses. These are perceptible prosodic features. The term **suprasegmental** means that they pertain to more than one sound (segment) and extend over units bigger than sounds – syllables, rhythmic units, tone groups, utterances, and stretches of discourse.

There are two basic approaches to **intonation** in western linguistics.

A. Intonation is viewed as variations in tone (pitch level) and stress; the factors of rhythm and tempo are also taken into account. This may be called a broad definition of intonation.

B. According to a narrow definition, intonation is the variations in the pitch

of voice, i.e. speech melody (Biber & Reppen, 2015; Crystal, 2003 b, p. 430; Intonation, 2021).

In terms of acoustics, both prosody and intonation are modifications in fundamental frequency, intensity, and duration.

6.2 PROSODIC UNITS

- syllable
- rhythmic unit
- tone group
- utterance
- discourse
  - ➢ See the subsection **The units of speech,** Topic 1, Section 1.3.

The **syllable** is the smallest prosodic unit. The prosodic features of the syllable depend on its position and status in bigger speech and language units. For example, the pitch level, loudness, and length of *im* will be different in

- ➢ *it's impossible;*
- ➢ *a long period of immobility;*
- ➢ *I like to improvise.*

The **rhythmic unit** is either one stressed syllable or a stressed syllable with a number of unstressed ones grouped around it (for examples, see Topic 1.) The stressed syllable is the **nucleus** of a rhythmic unit. Therefore the number of rhythmic units in an utterance depends on the number of stressed syllables in it. Unstressed syllables before the nucleus are called **proclitics**; those after the nucleus, **enclitics.** For example, in *I 'like it*, *like* is the nucleus of the rhythmic unit, *I* is the proclitic, and *it* is the enclitic. An initial rhythmic unit in an utterance may have proclitics and enclitics. The second, the third, etc. (non-initial) rhythmic units start with the nucleus and may have some enclitics.

The division of an utterance into rhythmic units may not coincide with the division into words.

For example, *That was exactly what they expected*

rhythmic unit 1: /ðæt wɒz ɪgˈzækt.li wɒt ðeɪ ɪk/

/ðæt wɒz ɪg/ – proclitics,

/ˈzækt/ – the nucleus,

/li wɒt ðeɪ ɪk/ – enclitics;

rhythmic unit 2: /ˈspek.tɪd /

/ˈspek/ – the nucleus,

/ tɪd / – the enclitic.

NB

In speech, stressed syllables occur at approximately equal intervals of time. It means that the more syllables there are in a rhythmic unit, the quicker they are pronounced. In the example above, there are eight syllables in rhythmic unit 1 and two syllables in rhythmic unit 2. The rate of speech in the first rhythmic unit is faster than that in the second one.

The prosodic properties of the rhythmic unit are

- pitch pattern (change in pitch level),
- accent-and-rhythm pattern,
- duration pattern.

Rhythmic units constitute larger prosodic units – tone groups. The **tone group** is a unit of speech that

- is grammatically relevant; for example, S + P, a clause, an introductory word group, etc.;

- has a definite meaning;
- has definite prosodic features – speech melody, accent, rhythm, tempo. The boundaries of a tone group are marked by pauses.

A tone group may be formed by one rhythmic unit (which, in its turn, may comprise one or several syllables – answers B, C, and D) or several rhythmic units (answer E). It may coincide with an utterance (answers B – E) or a part of an utterance (answer F).

For example,

	(a question)	(answers)
	A. *Had a good* ↗*holiday* ‖	B. ↘*Great* ‖
		C. *Oh* ↘*yes* ‖
		D. *Not so* ↗*bad* ‖
		E. '*Might have been* ↘*better* ‖
		F. ↘*Horrible* │ *I must* ↘*say* ‖

The elements of the tone group are the **nucleus** (the stressed syllable in the word that the speaker considers to be the most important one), the **pre-head** and the **head** (optional elements – stressed and unstressed syllables that precede the nucleus), the **tail** (an optional element – syllables that follow the nucleus). The nucleus is not only stressed, it is marked by a change in pitch level (falling tone, rising tone or their combinations). The combination of the nucleus and the tail (or just the nucleus if there are no other syllables after it) is the **nuclear tone**.

Tone groups have their own meanings, the most general ones being completeness and finality as opposed to incompleteness and non-finality.

The next unit in the prosodic hierarchy is the **utterance**. It is a communicative unit in the sense that it expresses a complete thought using lexical, grammatical, and prosodic features. The utterance may comprise one or more tone groups.

Structurally, it may coincide with a sentence, a word group or a word.

For example,

A. *In your opinion│does the candidate seem capable of running the department‖*

(one utterance, two tone groups)

B. *Yes‖But│frankly speaking│he has to learn quite a lot‖*

(two utterances; the first one comprises one tone group; the second one, three tone groups)

Utterances are constituents of a larger prosodic unit – discourse. **Discourse** is a sequence of utterances that form a coherent stretch of "naturally occurring spoken language" (Crystal, 2003 b, p. 116).

6.3 PROSODIC SUBSYSTEMS

- pitch
- utterance stress
- rhythm
- tempo
- pauses

6.3.1 PITCH

Pitch is "the relative highness or lowness of a tone as perceived by the ear" ("Pitch", 2021).

Speech melody is change in voice pitch, "the intonation of connected speech: the continual rise and fall in pitch of the voice in speech" (Merriam-Webster, 2021).

The acoustic correlate of pitch is fundamental frequency (see the subsections

ACOUSTIC PHONETICS and AUDITORY PHONETICS, Topic 1. PHONETICS, section 1.4 THE ASPECTS OF SOUND PHENOMENA. THE BRANCHES OF PHONETICS).

The subsystem of pitch involves

- pitch level,
- pitch range,
- tone.

Usually, three **pitch levels** are distinguished in unemphatic speech: low, mid, and high. Some phoneticians distinguish low, mid, high, and extra-high pitch levels. The pitch level of a tone group (or an utterance) is established according to its highest-pitched syllable. The higher is the pitch level, the more important is the information conveyed by a prosodic unit. For example, parenthetical items (words, phrases or utterances that are inserted in speech in order to explain or add information) usually have a lower pitch level than tone groups around them.

The **pitch range** is the "difference between the top and the bottom limits" of a tone group (Fox, 2002 p. 309). Three pitch ranges are usually distinguished: wide, mid, and narrow. The wider the pitch range is, the more emotional the speech sounds.

The **tone** is the variation in voice pitch – the direction (fall, rise or their combinations) and the rate of pitch movement in the nucleus (nucleus + tail) of a tone group. But this definition applies to kinetic tones only.

The two main types of tone are kinetic and static.

With **kinetic tones**, there is a change in pitch level; in other words, they move up and down. According to

J. D. O'Connor and G. F. Arnold (1973), there are six kinetic tones: Low Fall, High Fall, Rise-Fall, Low Rise, High Rise, Fall-Rise.

With **static tones**, the pitch level remains the same. Usually, it is mid-level tone (O'Connor and Arnold, 1973). According to some researches, there may be two extreme levels of static tones – low and high.

There are two factors in the rate of pitch variations in the nuclear tone:
- the time of pitch variation,
- the pitch range.

If the pitch range is the same, but the period of time is shorter, a falling/rising tone is steeper: diagrams A and B. If the time is the same, but the pitch range is wider, the fall/rise is steeper: diagrams C and D.

| A | B | C | D |
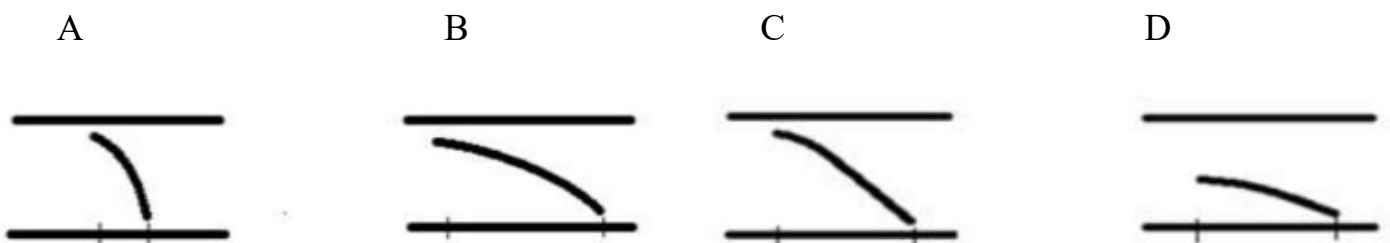
The steeper is the tone, the faster is the rate of pitch variation because "A steep rise or fall is one that goes very quickly from low to high or from high to low" (Cambridge Dictionary, 2021).

With falling tones, fast rate conveys a more categoric and definite meaning.

Topic for self-study

J. D. O'Connor and G. F. Arnold's System of Intonation Patterns: The Ten Tone Groups.

See:

➢ Appendix F.

6.3.2 UTTERANCE STRESS

Stress is a component in the phonetic structure of the word. But not all words are equally important in an utterance. Special prominence is given to the words that are important for understanding the meaning of an utterance and the words that the speaker wants to emphasize. This prominence is called **utterance stress.** The effect of stress is produced through the variations in pitch, loudness, length, and quality of sounds (auditory features). The corresponding acoustic features are fundamental frequency, intensity, duration, and formant structure.

Issues for self-study

- the main types of utterance stress: nuclear stress (marked by a kinetic tone), non-nuclear full stress (usually marked by static tones), partial stress (syllables are not pitch prominent, their pitch usually depends on the pitch pattern of the preceding fully stressed syllables);
- stress and accent.

See:

➢ Appendix F.

Notional words are typically stressed. The nuclear stress marks the word that, in the speaker's opinion, is crucial for understanding the meaning of an utterance. Other notional words may carry non-nuclear full stress if the speaker thinks they are important. For example, ˈCome and ˈsee me after ↘lunch ‖

Function words (prepositions, auxiliary verbs, conjunctions, articles) are typically unstressed. But the grammatical structure of a sentence may influence the stress pattern of an utterance.

For example, auxiliaries are usually unstressed: *She's a* ↘*writer*‖, but they are stressed in short responses: *A. Is she a* ↗*writer*‖ *B.* ↘*Yes* ‖S*he* ↘ *is*‖; and they may be stressed for emphasis: *She* ↘*is a writer*‖

Also, words may be stressed or unstressed for rhythmical purposes. For example, in *I've 'told them 'nothing at* ↘*all*‖ the word *told*, which is not so important, is stressed for rhythmical purposes.

Functions of utterance stress:

➢ stress helps to form an utterance by indicating words that carry important information;

➢ stress is a factor in creating rhythmic pattern of an utterance, which helps to delimit tone groups and utterances;

➢ emphasizing certain words, a speaker can differentiate between meanings of utterances; e.g., *Did he* ↗*come*‖ *Did* ↗*he come*‖

6.3.3 RHYTHM

Rhythm is the regular occurrence of prominent syllables in tone groups, utterances or larger stretches of speech.

English rhythm is **stress-timed**. It means that stressed syllables in a tone group or an utterance occur at approximately equal intervals of time, regardless of the number of unstressed syllables between two stressed ones (see the example and the explanation in the subsection **Rhythmic unit** of 6.2 PROSODIC UNITS).

The greater the number of unstressed syllables between the two stressed ones, the quicker they are pronounced; e.g., *That was exactly what they expected.*

rhythmic unit 1 /ðæt wɒz ɪgˈzækt.li wɒt ðeɪ ɪk/:   /ðæt wɒz ɪg/ – proclitics,

/ˈzækt/ – nucleus,

/li wɒt ðeɪ ɪk/ – enclitics;

rhythmic unit 2   /ˈspek.tɪd /:   /ˈspek/ – nucleus,

                                          / tɪd / – enclitic.

There are eight syllables in rhythmic unit 1 and two syllables in rhythmic unit 2, therefore rate of speech in rhythmic unit 1 is faster than that in rhythmic unit 2.

Proclitics occur only in the **initial rhythmic unit**. Usually, they are pronounced quickly. Non-initial rhythmic units begin with a stressed syllable that may be followed by enclitics.

6.3.4 TEMPO

Speech tempo is the rate (speed) at which utterances are pronounced. It is usually measured as a number of syllables per second.

There is a distinction between (a) measuring the speed of speech units including pauses and (b) measuring the speed of periods of speaking only, i.e. excluding pauses. It is obvious that the number and lengths of pauses affect the general speech rate.

Speech tempo is usually described as normal, fast, and slow. It is determined by the relative importance of information conveyed by the speaker. An utterance (or a tone group) sounds more important if pronounced slowly (for example, *We – are – not – supposed – to – do – it*). Fast tempo indicates a lesser degree of importance (for example, A. *Problem?* – B. *Nottoworry.*)

Tempo of speech may also convey the speaker's emotions. Fast tempo is usually associated with strong emotions, both positive and negative ones, such as joy, anger, etc. Slow tempo indicates a calm or reserved attitude. Yet it is all rather relative. For example, a deliberately slow tempo may be used when a speaker experiences a strong negative emotion – controlled rage, disgust, etc.

6.3.5 PAUSES

Pauses divide the speech continuum into relevant units (tone groups, utterances, complete stretches of discourse). In connected speech, pauses are a factor in speech rate, which depends on their number and length.

There are three main types of pauses:

- silent pauses,

- pauses of perception,

- voiced (filled) pauses.

A **silent pause** is a period of silence, though it may contain "breath noises or tongue clicks" (Belz & Trouvain, 2019).

According to the criterion of length, silent pauses are short (between two intonation groups), long (between two utterances), and extra-long (between two paragraphs).

With **pauses of perception** there is no period of silence. The brain may perceive a sharp change in pitch direction, duration or both as a pause. Typically it occurs at the junction of intonation groups within one utterance.

From a phonetic perspective, **voiced (filled) pauses** are sounds like *uh, er, hm*, etc. that signal hesitation.

Topic for self-study

6.4 FUNCTIONS OF INTONATION / PROSODY

See:

➤Crystal, 2003 a, p. 249.

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A. English vowels: Monophthongs

B. English vowels: Monophthongs. Articulation

C. English diphthongs

D. English consonants

E. English consonants. Glossary

F. J. D. O'Connor and G. F. Arnold's system of intonation patterns: The ten tone groups