# The Phonological Analysis of English Speech Sounds

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# The Phonological Analysis of English Speech Sounds

- Speech sounds are studied both by **phonetics** and **phonology**, but phonetics studies them as articulatory and acoustic units whereas phonology studies them as functional units which serve people for communicative purposes.

# The Phonological Analysis of English Speech Sounds

- In connected speech a sound is generally modified (*видоизменять, трансформировать*)
- 1) by the neighbouring sounds;
- 2) by its position in a word or a phrase;
- 3) by prosodic features: stress, melody, the tempo of speech

# *The phoneme, its definition, aspects and functions*

/**p**il/ - /s**p**il/ - /sli**p**/ - /ˊsli**p**ə/

pill – spill – slip – slipper

The various /p/-sounds differ in the manner of articulation and the acoustic qualities. But they do not differ phonologically. If one of them is substituted for another, the meaning of the word will not change.

# The Phonological Analysis of English Speech Sounds

pill – bill

**/p/ /b/**

pill – mill

**/p/ /m/**

The substitution of one sound for the other will change the meaning of the word and effect communication.

# *The phoneme, its definition, aspects and functions*

- That's why /**p**/ and /**b**/ are different elements of the English phonetic system, *they are* ***different phonemes.***
- And the various /p/-sounds in the words *pill – spill – slip – slipper* are ***positional variants*** or ***allophones*** of the phoneme /p/.

# *The phoneme, its definition, aspects and functions*

- All the actual (*реально существующие*) speech sounds, pronounced by the speaker are, are positional variants or allophones of the phoneme that exist in a language.
- In English there are 20 vowel phonemes and 24 consonant phonemes.
- In Russian there are 6 vowel and 35 consonant phonemes.

## *The phoneme, its definition, aspects and functions*

### V.A. Vassilyev

The segmental phoneme is the smallest (i.e. further indivisible into smaller consecutive segments) language unit that exists in the speech of all the members of a given language community as such speech sounds which are capable of distinguishing one word from another word of the same language or one grammatical form of a word from another grammatical form of the same word.

## The aspects of the phoneme:

- material, real and objective
- abstractional and generalised
- functional

## *The phoneme, its definition, aspects and functions*
## *Aspect 1*

- The phoneme has a *material aspect* because it exists in speech in the material form of speech sounds – allophones.
- The phoneme is also a linguistic *reality* because it exists in real speech.
- The phoneme is *objective* because it exists independently of the will of individual persons.

## *The phoneme, its definition, aspects and functions Aspect 2*

- The phoneme is abstracted from its variants that exist in actual speech and, at the same time, it is characterized by features common to all its variants (e.g.: /b/ is an occlusive, bilabial, lenis, consonant/. These features are common to all its allophones.

## *The phoneme, its definition, aspects and functions*
## *Aspect 3*

- The phoneme has a *functional aspect*: it is capable of differentiating words and their grammatical forms.

## The functions of the phoneme:

. **1) distinctive**

***word-distinctive*: /ˊdri:mə - ˊdri:mi/**

***form-distinctive*: /ɑ:sks - ɑ:skt/**

***sentence-distinctive*: It was cold.**

**It was gold.**

**The functions of the phoneme:**

**.2) constitutive** (являющийся образующим или неотъемлемым элементом чего-л.)

The phonemes in isolation have no meaning, but they constitute morphemes and words, all of which are meaningful.

**The functions of the phoneme:**

- **3) recognitive (identificatory)**
- *(распознавательная)*

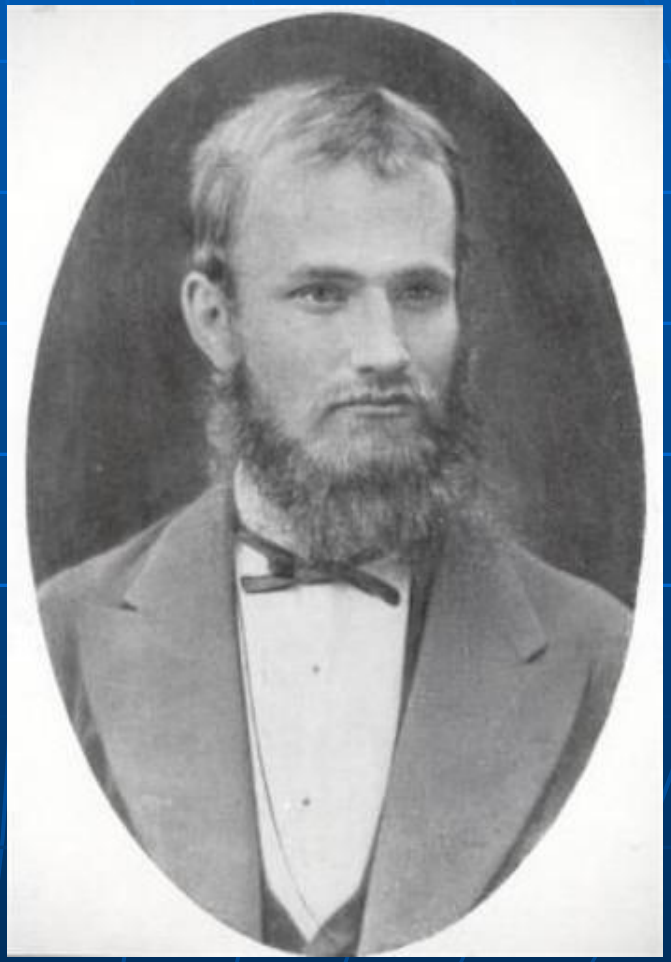
This function of the phoneme consists in making words with their grammatical forms easily recognizable as a result of the use of right allophones in their right places.

## *The phoneme theory*

- The phoneme theory was originated in Russia. Its founder was Prof. I.A. Bauduoin [ˈbɔ:dwin] de Courtnay [ˈkɔ:tnɪ].

## *The phoneme theory*

**Baudouin de Courtenay**
Ivan Alexandrovich
(born Jan Nechislav)
**(1845-1929)**
linguist-theorist, Slavonic scholar, worker of the Higher School of Russia and Poland, Corresponding Member of the Petersburg Academy of Sciences



## *The phoneme theory*

- Baudouin de Courtenay supported the so-called **psychological school** of thought in linguistics.
- A phoneme is defined by him as a *group of related* (родственный) *sounds* of a given language which are so used in connected speech that no one of them ever occurs in the position which any other can occupy.

## *The phoneme theory*

**Lev Vladimirovich Shcherba**

(commonly Scherba)

**(1880 –1944)**

Russian linguist and lexicographer specializing in phonetics and phonology.

## *The phoneme theory. Shcherba.*

- L.V. Shcherba developed Baudouin de Courtenay's views.
- He separated phonetics from phonology and stated that sounds also possess functional properties.
- In every language all speech sounds are united in a comparatively small number of sound types which are capable of distinguishing the meaning and the form of words.

## *The phoneme theory . Shcherba*

- Such types are called *phonemes*. The numerous speech sounds we actually utter are phonemic variations – *allophones*.
- Shcherba's conception is a truly materialistic theory of the phoneme.
- He was the first who defined the phoneme as a real independent distinctive unit which manifests itself in the form of allophones.

## *The phoneme theory*

**Daniel Jones**

**(1881 –1967)**

a London-born British phonetician considered by many to be the greatest phonetician of the early 20th century. He was head of the Department of Phonestics at University College, London.

# *The phoneme theory. Daniel Jones*

- Daniel Jones was a founder of the so-called ***'physical' view*** which regards the phoneme as a 'family' of related sounds in which various members of the 'family' must be similar to one another, but *no member of the 'family ' may occur in the same phonetic context as the other.*

# *The phoneme theory. Daniel Jones*

- The ***physical approach*** overestimates the material aspect of the phoneme as it regards the phoneme as a group of *articulatory* similar sounds without any regard to its *functional* and *abstract* aspects.

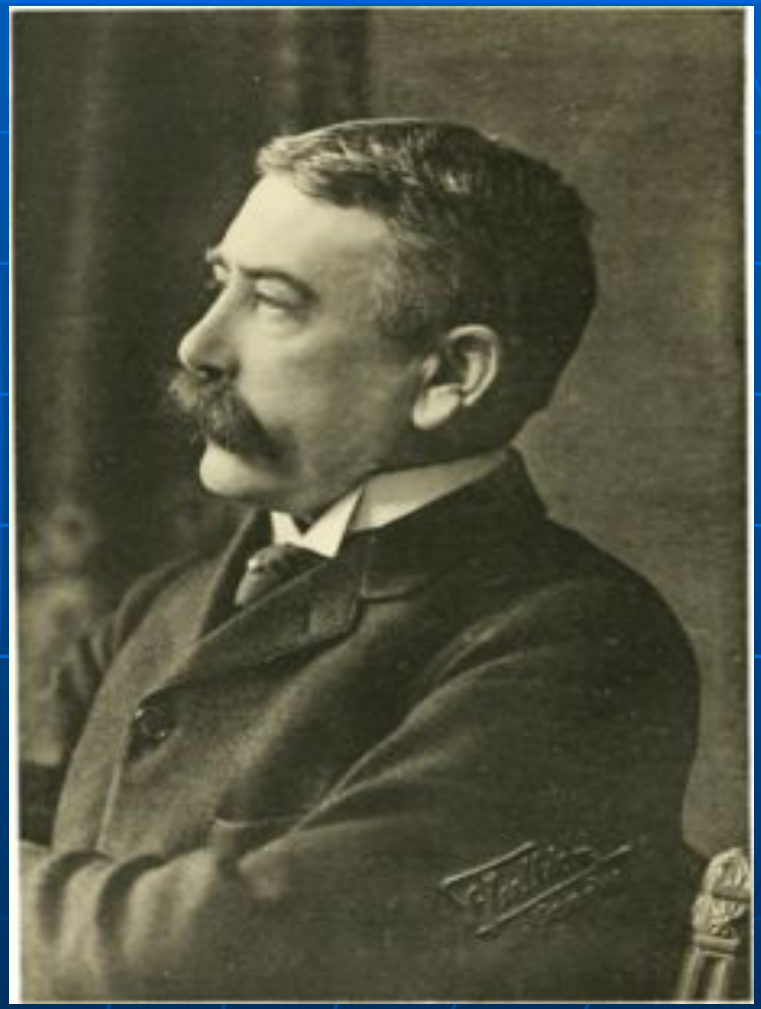
## *The phoneme theory*

**Ferdinand de Saussure**

[sɔːˈsʊər], [soʊˈsʊər]

**(1857 –1913)**

a Swiss linguist whose ideas laid a foundation for many significant developments in linguistics in the 20th century. Saussure is widely considered to be one of the fathers of 20th-century linguistics and of semiotics, and his ideas have had a monumental impact throughout the humanities and social sciences.



## *The phoneme theory. Ferdinand de Saussure*

- Ferdinand de Saussure expressed the similar views.
- He regarded phonemes as the sum of acoustic impressions and articulatory movements.

## *The phoneme theory*

**Trubetzkoy Nikolai Sergeyevich (1890 - 1938)**

a Russian linguist and historian whose teachings formed a nucleus of the Prague School of structural linguistics. He is widely considered to be the founder of morphophonology.

## *The phoneme theory. Trubetzkoy*

- N. Trubetskoy expressed the opposite approach – the so-called ***'functional' view***.
- It regards the phoneme as a minimal sound unit by which meanings can be differentiated without much regard to the actually pronounced speech sounds.

# N. Trubetskoy's views

Phoneme – a unity of phonologically relevant features.

Archi-phoneme – an abstraction which combines the distinctive features common to two phonemes.

## *The phoneme theory*

**Leonard Bloomfield (1887 –1949)**

an American linguist who led the development of structural linguistics in the United States during the 1930s and the 1940s.

## *The phoneme theory*

# Edward Sapir

## (1884 –1939)

a German-born American anthropologist-linguist and a leader in American structural linguistics. He was a highly influential figure in American linguistics, influencing several generations of linguists across several schools of the discipline.

## *The phoneme theory. Structuralists*

- The American structuralists **Leonard** /lenəd/ **Bloomfield, Edward Sapir** /səpɪə(r)/ and others expressed the similar view.
- They defined the phoneme as a bunch or a bundle of distinctive features, as an ‘abstractional fiction…’.

## *The phoneme theory*

- The **functional view** of the phoneme can be qualified as ***idealistic*** as it regards the phoneme as an abstract conception existing in the mind but not in reality, that is in human speech.

## *Methods of phonological analysis*

***Distributional method*** is based on the phonological rule that different phonemes can freely occur in one and the same position, while allophones of one and the same phoneme occur in different positions and, therefore (поэтому, следовательно), cannot be phonologically opposed to each other.

**pea – bee**

**/p/ /b/**

**rope – robe**

# *Methods of phonological analysis*

***Semantic method*** is based on the phonological rule that can distinguish words when opposed to another phoneme or zero in an identical phonetic position.

## *Methods of phonological analysis*

**/si:z/ - /si:t/**

**/z/ vs** (versus) **/t/** phonological opposition

**/si:z/ - /si:/**

**/z/ vs /-/** zero opposition

# *Methods of phonological analysis*

**Minimal pairs** – the pairs of words which differ only in one speech sound.

pill – bill /pil – bil/

sea – tea /si: - ti:/

rise – raise /raiz – reiz/

beat – bee /bi:t – bi:/

# *Methods of phonological analysis*

- If two speech sounds distinguish words with different meanings, they are a realization of two different phonemes.
- If not, they are different allophones of one and the same phoneme.
- But with the sound of a complex nature the establishment of phonological opposition is not enough to determine the phonemic status of a sound.

## *Methods of phonological analysis*

/tʃ/ - /dʒ/ eat – each, head – hedge

/t/ vs /tʃ/  /d/ vs /dʒ/

/tr/ - /dr/ tie – try,  die – dry

/t/ vs /tr/  /d/ vs /dr/

/ts/ - /dz/ hat – hats, buzz – buds

/t/ vs /ts/  /z/ vs /dz/

## *Methods of phonological analysis*

The rules to determine the phonemic status of a sound of a complex nature (by N. Trubetskoy):

1) **A phoneme is indivisible as no syllable division can occur within it.**
2) **A phoneme is produced by one articulatory effort.**
3) **The duration of a phoneme should not exceed that of other phonemes in the language.**

# *Methods of phonological analysis*

- These rules helped to conclude that /tʃ/ and /dʒ/ in the words like *cheese, each, jail, hedge* are monophonemic, because these sounds are produced by one articulatory effort and no syllable division occurs within the sounds /tʃ/ and /dʒ/.
- Opinions differ about the status of /tr/ and /dr/, but most phoneticions regard them as biphonemic clusters.

## *Methods of phonological analysis*

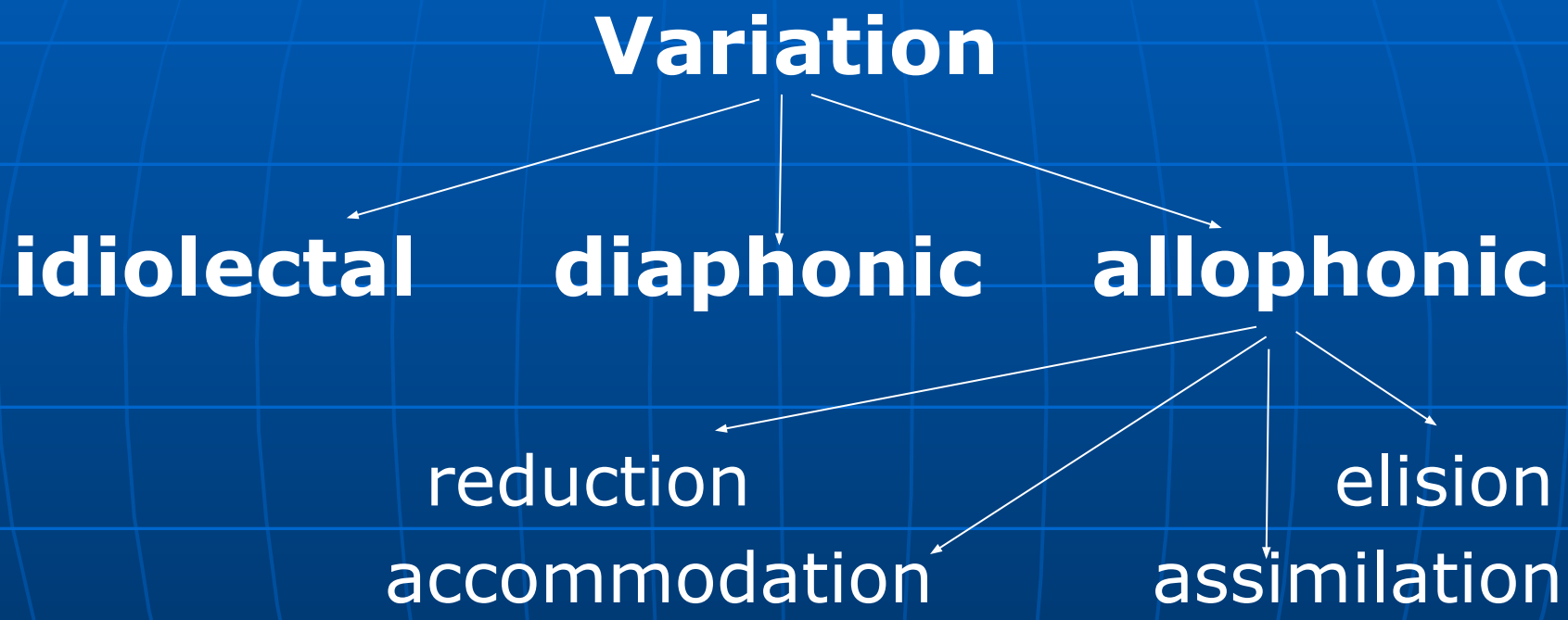
The phonemic status of complex vowels:

- Diphthongs → monophonemic
- Triphthongs → biphonemic

aiə = ai + ə (fire /ˊfaiə/)

auə = au + ə (hour /ˊauə/)

# *Modifications of phonemes in speech*



# *Modifications of phonemes in speech*

- **Idiolectal variation** embraces the individual peculiarities of articulating sounds. For instance, the speaker may mumble (нечётко произносить), or lisp (say *'thish ish'* for *'this is'),* or stutter (say *a f-f-f-fine d-d-d-day)/*
- **Idiolectal variation** may cause a lot of difficulties in the communication.

# *Modifications of phonemes in speech*

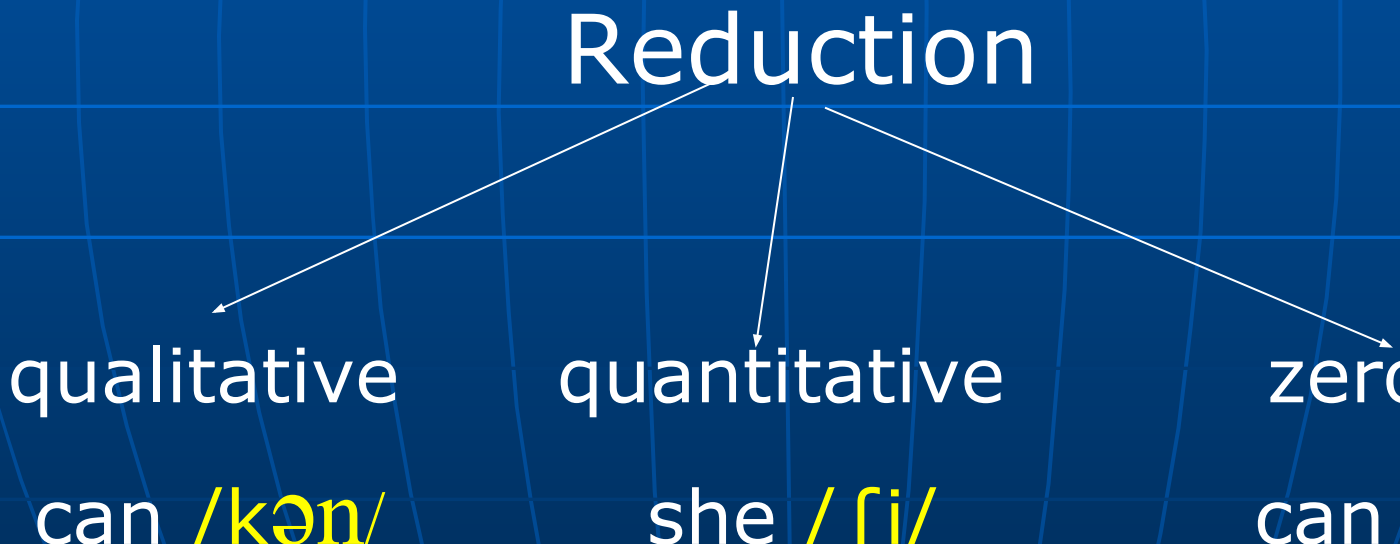
- **Diaphonic variation** is caused by concrete historical tendencies active in certain localities.
- E.g., the diaphonic variation of the sound /æ/ ranges (колеблется) from a front open /æ/ in the southern part of England to /ɑ:/ in Northern England.

# *Modifications of phonemes in speech*

- **Allophonic variation** is conditioned by phonetic position and phonetic environment (the influence of the neighbouring sounds).
- The main types of allophonic variations are reduction, elision, assimilation and accommodation (or adaptation).

## *Modifications of phonemes in speech*

**Reduction** – the weakening of articulation and shortening of the duration of unstressed vowels



# *Modifications of phonemes in speech*

- In *qualitative reduction* the unstressed vowel is usually reduced to /ə/.
- In *quantitative reduction* the unstressed vowel is shortened.
- In *zero reduction* the unstressed vowel is dropped.

## *Modifications of phonemes in speech*

**Elision** – the disappearance of a sound

Elision

historical

know /n**əu**/

palm /pɑ:m/

juxtapositional (contemporary)

a blin**d** man /ə blain mæn/

si**t** down /si daun/

# *Modifications of phonemes in speech*

- *Historical elision* reflects the process in which a sound that existed in an earlier form of a word was omitted in its later form (e.g. *cu**p**board).*
- In *juxtapositional elision* a sound that exists in a word pronounced by itself is dropped in connected speech (especially in rapid speech).

## *Modifications of phonemes in speech*

**Assimilation** – the process by which a sound is altered through the influence of a neighbouring sound.

# *Modifications of phonemes in speech*

Assimilation may influence:

- the work of the vocal cords (*voice assimilation)*;
- the active organ of speech;
- the manner of noise production *(loss of plosion or incomplete plosion);*
- the place of articulation (in trip *alveolar* /**t**/ becomes *post-alveolar*).

# *Modifications of phonemes in speech*

- *Voice assimilation* is observed when one of the two adjacent [ə̟dʒeɪs(ə)nt] (*смежный, соседний*) consonants becomes *voiced* under the influence of the neighbouring voiced consonant, or *voiceless* - under the influence of the voiced consonant. E.g.:

translate [trən**z** ˈleɪt], I shoud pay [aɪ ʃ**t** ˌpeɪ].

# *Modifications of phonemes in speech*

The active organ of speech may be affected in a careless rapid speech, e.g.:

Give me /ˌgɪm mɪ/;

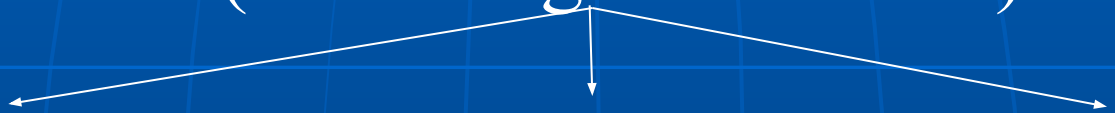
bad pain /ˈbæb ˌpeɪn/;

queen mother /ˈkwi:m ˌmʌðə/.

# *Modifications of phonemes in speech*

## Assimilation

(according to direction)



**progressive**

desks /desks/

bags /bægz/

happen /hæpm/

**regressive**

at the desk /ət ðə/

( /t/-dental )

good bye /gub bai/

give me /gim mi/

**double**

(bidirectional)

twice /twais/

/dj/ > /dʒ/ education

/tj/ > /tʃ/ situation

/sj/ > /ʃ/ issue

## *Modifications of phonemes in speech*

**Accommodation** (adaptation) – the process of adapting the articulation of a vowel to a consonant, or a consonant to a vowel.

Vowels:

- nasalization: [tẽn]
- shortening: *cease* [si·s]

Consonants:

- palatalization: / ʃ, ʒ, tʃ ʃ, dʒ/ *shirt, cheese, June*
- labialization: Compare /t/ in *tea* and *two*

# *Modifications of phonemes in speech*

## The causes of allophonic variation:

1. **"Economy of effort"**
2. **"The law of the stronger" (M. Grammont)**

   E.g. *of course* / əf͡kɔ:s/

3. **Frequency of occurrence (H. Fletcher)**

   **Frequent consonants: /t, n, s, ð, l, d/**

# Sound interchange

## Sound interchange (alternation of sounds)

**/k – tʃ/** *speak – speech*
**/i: - əu/** *speak – spoke*

Alternation series:
**/I – æ – ʌ/** *begin – began – begun*
**/d – t – t/** *build – built - built*

# Causes of sound interchange

- Synchronic → *phonetic or positional alternation of speech sounds*

  **/t –d –id/**

  **/s- z – iz/**

- Diachronic → *historical alternations of speech sounds*

## Sound interchange

# Vowel alternations are used:

1) To form the plural of some nouns

**/ æ – e/** ***man – men;***

**/u: - i:/** ***goose - geese***

2)To build the basic forms of irregular verbs

**/ai - əu –ɪ/** ***drive – drove – driven***

3) In word-formation to distinguish different parts of speech

**/e – i:/** ***breath (n) – breathe (v)***

4) To distinguish words which are etymologically related

**/eɪ – æ/** ***shade - shadow***

# Sound interchange

Consonant alternations are used:

1) To distinguish forms of verbs

***/d – t/ send – sent, build – built***

2) To form the plural of some nouns

***/f – v / leaf – leaves, wife – wives***

3) To distinguish parts of speech

***/k - tʃ/ speak (v) – speech (n)***

***/d – z/ applaud (v)– applause (n)***

4) In word-building when a suffix is added

***/t -ʃ/to correct – correction***

***/d - ʒ/ to decide – decision***

***/s - ʃ/ to express - expression***

# IPA
# International Phonetic Alphabet

represents each sound of human speech with a single symbol

# Types of transcription

Transcription is a visual system of notation of the sound structure of speech.

Types of transcription

| phonemic (broad) | phonetic (narrow) |
| --- | --- |
| *'one symbol per phoneme'* | *'one symbol per allophone'* |
| **/ˊpi:pl/, /bɔ:l/** | **[ˊpʰi:pl], [bɔ:ł]** |

# Types of transcription

- Phonemic transcription shows only functional differences, i.e. differences between sounds that are used to distinguish word meanings. The symbols are placed between slanting lines, i.e. **/ˊpi:pl/, /bɔ:l/**
- Phonetic transcription attempts to provide a more exact representation of speech. It represents the allophones of a phoneme that occur in various contexts.

# Types of transcription

- Phonetic transcription provides a special symbol for each variant of each phoneme. The symbols are placed between square brackets, i.e. the symbol [**ɛ**] denote a more open variant of the English /**e**/-phoneme, the symbol [**ɬ**] is used for a dark variant of the /**l**/-phoneme.

# Types of transcription. Diacritic Marks

Diacritic Marks - различные надстрочные, подстрочные, реже внутристрочные знаки, применяемые для изменения или уточнения значения других знаков.

◌̥ - voiceless: bag [bæg̥], [beɪð̥] bathe, [tʰæb̥z̥] tabs

◌̬ - voiced: letter [ˈleṭə] – American voiced /t/.

◌ʰ - aspirated: [pʰet], [tʰeik], [kʰæt].

◌ʷ - labialised: two [tʷu:], cool [kʷu:l].

◌̩ - syllabic: kettle [ˈketl̩], cotton [ˈkɔtn̩]

# Types of transcription. Diacritic Marks

**~ - nasalized: [tẽn], [pɒ̃nd], [mæ̃n].**

**: - long: see [si:], [bɑ:k].**

**ˑ - half-long: seat [siˑt].**

**ʳ- rhotocised (i.e. r-coloured):[ˈsentəʳ], [kɑʳt].**

**˖ - fronted,** i.e. velar is made with the back of the tongue moved forward close to the hard palate when it is followed by a front vowel as in key **[ki:]**

**̪ - dental** position of the **alveolar** consonants: ninth **[naɪn̪̪θ]**, tenth **[tʰen̪̪θ]**.

# Define the peculiarities of the sounds in the following words

| | | | |
|---|---|---|---|
| [ˈkʰætɬ̩] | cattle | [ˈmĩdɬ̩] | middle |
| [eɪt̪θ] | eighth | [ˈ mɑ̃ːʳtɪn] | martin |
| [æ̃nt] | ant | [fãɪnɬ] | final |
| [tʰen̪θ] | tenth | [ˈbɛt̪ə̆] | better |
| [ˈælbm̩] | album | [ˈgʷʊd] | good |