

**THE COMBINATORY POSITIONAL CHANGES OF PHONEMES**

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**Annotation:** *The study explores the complex system of combinatory and positional changes of phonemes, which represent two fundamental categories of phonetic variation in natural languages. While phonemes are traditionally viewed as stable, contrastive units of a language's sound system, their actual realizations in spoken communication are dynamic and context-dependent. Combinatory changes arise through the direct interaction of adjacent sounds and reflect the pervasive influence of coarticulation. These include assimilation, where one phoneme becomes similar to a neighboring phoneme in terms of voicing, place, manner, or other articulatory features; accommodation, which involves mutual influence between consonants and vowels; and coalescence, in which two sounds merge to form a single new segment. Such processes reveal the mechanisms through which speakers optimize articulatory transitions, reduce effort, and maintain fluency in connected speech.*

*Positional changes, on the other hand, are governed by the phoneme's structural location within a word or syllable rather than by immediate phonetic environment.*

*Taken together, combinatory and positional changes provide insight into how phonological systems balance stability with flexibility. Their study is essential for understanding the relationship between abstract phonemic representations and their surface realizations, for analyzing sound patterns synchronically and*

*diachronically, and for improving linguistic models of speech perception and production.*

**Keywords:** phonemic variation in connected speech, context-dependent allophonic realizations, combinatory phonetic changes, positional phonetic changes, regressive, progressive, and reciprocal assimilation, coarticulatory influence between adjacent sounds, vowel–consonant accommodation processes, coalescence and sound merging phenomena, vowel reduction in unstressed syllables, quantitative and qualitative vowel reduction, neutralization of phonological oppositions, position-based allophones of consonants and vowels, articulatory and acoustic phonetics, phonotactic and prosodic conditioning of sound change, syllable structure and stress-dependent variation, speech economy and articulatory simplification, connected-speech phonological processes, phonological system adaptability and variation, surface vs. underlying phonemic representations.

The study of phonemes and their contextual variations occupies a central position in both theoretical and applied linguistics. Although phonemes are traditionally defined as the smallest distinctive units of a language's sound system, their actual realization in speech is far from uniform or fixed. Rather than functioning as stable, isolated entities, phonemes exist within a dynamic continuum of phonetic conditions that shape their surface forms. These conditions give rise to systematic modifications known as combinatory and positional changes, which form the foundation of allophonic variation. Understanding these changes is essential for explaining how abstract phonological structures interact with real-time speech production.

Combinatory changes result from the immediate influence of neighboring sounds and are fundamentally rooted in the phenomenon of coarticulation, whereby articulatory movements overlap in time. They reflect the natural tendency of speakers to minimize effort and maximize fluency. The most prominent combinatory processes—such as assimilation, accommodation, and coalescence—demonstrate how segments adjust to each other to create smoother transitions. Assimilation may involve voicing, place, or manner of articulation; accommodation reveals the

reciprocal influence between vowels and consonants; and coalescence shows how two adjacent segments may merge into a single phonetic unit. Taken together, these processes illustrate the highly interactive nature of speech and highlight the role of articulatory economy in shaping sound patterns.

## 2.1 Assimilation of Phonemes

Assimilation is a pervasive phonetic process in which a phoneme becomes more similar, either partially or completely, to an adjacent phoneme in one or more articulatory or acoustic features. It is one of the most important types of combinatory changes in languages, occurring to facilitate speech fluency, reduce articulatory effort, and enhance temporal economy in connected speech.

Assimilation can affect consonants, vowels, or both, and it may occur within a word (internal assimilation) or across word boundaries (external assimilation). Its manifestation is governed by phonetic, prosodic, and sometimes morphological conditions.

### 1. Classification of Assimilation

#### 1.1 By Direction

##### a) Progressive Assimilation

The influence moves forward, from the preceding sound to the following one. The preceding sound “conditions” the articulation of the next sound.

English examples:

Plural –s after voiced consonants: dogs → /dɒgz/

Past tense –ed after voiced consonants: begged → /begd/

Russian examples:

подъезд → [pəd'jɛst] — the voicing of /d/ influences the following /j/.

Progressive assimilation is common in morphological endings, where affixes adapt to the preceding stem consonant.

##### b) Regressive Assimilation

The influence moves backward, from the following sound to the preceding one. This is very common in Russian and many Slavic languages, as well as in rapid English speech.

English example: *input* → [ɪmput] — /n/ becomes /m/ before the bilabial /p/.

Russian example: *сделать* → [z̥delət̥] — /s/ becomes /z/ under influence of voiced /d/.

Regressive assimilation often occurs before consonant clusters and can affect voicing, place, or manner.

### c) Reciprocal (Mutual) Assimilation

Both adjacent sounds influence each other, leading to a new articulatory equilibrium.

Example: English *don't you* → [dənt̩ʃu]

/t/ + /j/ interact mutually, producing [tʃ].

Reciprocal assimilation is less frequent than progressive or regressive but is significant in fast, connected speech.

## 1.2 By Degree

### a) Complete Assimilation

The affected sound becomes identical to its neighboring phoneme in one or more features.

Ten boys → [tem bɔɪz] (English rapid speech)

сжать → [z̥at̥] (Russian)

Complete assimilation is often found in clusters of identical or similar sounds, especially in casual speech.

### b) Partial Assimilation

Only one or several features of the phoneme are affected (e.g., place, voicing, or nasality), while others remain unchanged.

Good boy → [gʊb bɔɪ] — /d/ partially assimilates to bilabial /b/

have to → ['hæf tə] — voicing assimilation occurs without changing manner.

Partial assimilation maintains some phonemic contrast while optimizing articulation.

## 1.3 By Articulatory Feature

### a) Place of Articulation



Alveolar consonants may shift to match a following bilabial or velar consonant.

English: /n/ → [ŋ] before velars /k, g/: think → [θɪŋk]

b) Manner of Articulation

Stops may become nasals or fricatives in clusters:

English: input → [ɪmɒp̪t̪] — /n/ becomes nasal to match /p/.

c) Voicing

Consonants adjust voicing to match adjacent consonants:

of course → [əfkɔ:s] — /v/ becomes voiceless before /k/.

d) Palatalization

Consonants may acquire palatal features before front vowels or /j/:

nature → ['neɪtʃər] — /t/ + /j/ → /tʃ/

e) Nasality

Vowels may become nasalized before nasal consonants:

man → [mæn]

## 2. Linguistic Significance of Assimilation

Articulatory Economy: Reduces the effort required to produce adjacent sounds.

Speech Fluency: Ensures smoother transitions and faster speech.

Allophonic Variation: Explains why a single phoneme has multiple surface forms.

Morphophonemic Alternations: Accounts for changes in word forms during inflection.

Cross-linguistic Relevance:

English shows assimilation mainly in connected speech. Russian exhibits extensive regressive assimilation of voicing in consonant clusters.

French and Portuguese use nasal assimilation extensively.

## 3. Examples Across Languages

Language

Example



Assimilation Type

Feature Affected

English

input → [ɪmput]

Regressive

Place of articulation

English

ten boys → [tem bɔɪz]

Complete

Place & voicing

Russian

сделать → [zjdelətj]

Regressive

Voicing

French

bon pain → [bɔ̃ pɛ̃]

Progressive

Nasality

Portuguese

um bom → [ũ bõ]

Regressive

Nasality

Assimilation is a dynamic and pervasive combinatorial process that affects phonemes in predictable ways depending on direction, degree, and articulatory features. It highlights the interdependence of sounds, demonstrates the interaction between phonology and phonetics, and provides insight into allophonic distribution, connected speech patterns, and cross-linguistic variation. Mastery of assimilation patterns is crucial for linguistic analysis, pronunciation teaching, and speech technology applications.

## 2.2 Accommodation of Phonemes



Accommodation is a phonetic process in which the articulation of a vowel or consonant is modified due to the influence of an adjacent segment, without necessarily making the sounds identical. Unlike assimilation, which often creates similarity or identity, accommodation involves subtle, gradient adjustments in articulatory settings. It reflects the natural overlapping of speech gestures that occurs in fluent, connected speech and is a key aspect of coarticulation.

Accommodation is universal in spoken languages and affects both consonants and vowels. It plays a crucial role in speech fluidity, articulatory efficiency, and allophonic variation.

## 1. Types of Accommodation

### 1.1 Vowel Influencing Consonant

Vowels, especially those with distinctive articulatory features like rounding, height, or frontness, can influence adjacent consonants. This type of accommodation is most commonly observed in coarticulatory rounding or fronting effects.

Example: English *too* /tu:/ — slight lip rounding occurs during the /t/ due to the following rounded vowel /u:/.

Example: English *key* /ki:/ — the /k/ is slightly fronted due to the high front vowel /i:/.

In some languages, vowel-consonant accommodation can even affect manner of articulation subtly, producing palatalized or labialized consonants adjacent to specific vowels.

### 1.2 Consonant Influencing Vowel

Consonants can also modify the quality of adjacent vowels. This occurs when the place, manner, or secondary features of a consonant influence vowel articulation.

Palatal or alveopalatal consonants: cause vowels to become fronted or raised.

Example: English /j/ in *yes* → slightly raises the following vowel.

Russian: /tj/ in *тёмный* → [tjœmnij] causes fronting of the vowel.

Velar consonants: tend to back vowels.

Example: English *cool* /ku:l/ — /k/ slightly backs the vowel /u:/.



### 1.3 Nasalization

A subset of vowel-consonant accommodation is vowel nasalization before nasal consonants.

English: man → [mæn]

French: bon → [bɔ̃]

This process demonstrates how consonantal features can extend their articulatory influence to adjacent vowels, often without creating full phonemic change.

### 1.4 Labialization and Rounding Spread

Rounded vowels often induce labialization in preceding or adjacent consonants.

Example: English /w/ in quick is labialized before /u:/: [kʷu:ɪk]

Example: Russian: /v/ + /o/ can slightly round the /v/ articulation.

### 1.5 Tongue Height and Fronting Adjustments

Vowels may adjust their height or frontness depending on the preceding or following consonant, producing subtle shifts that do not necessarily result in phonemic change.

English: bet /bɛt/ vs. bit /bɪt/ — slight influence of the final /t/ on vowel quality.

Uzbek: Palatal consonants influence the fronting of adjacent vowels.

## 2. Characteristics of Accommodation

**Gradient and Subtle:** Unlike assimilation, accommodation does not always produce categorical changes; the modifications may be continuous and variable.

**Bidirectional:** Influence can be consonant → vowel or vowel → consonant.

**Phonetic, Not Phonemic:** Usually does not create new phonemes; it produces allophonic variation.

**Context-dependent:** The effect depends on adjacent sounds, stress, syllable structure, and speech rate.

Language-specific: While present in all languages, specific patterns vary. English, Russian, and French demonstrate different types of vowel-consonant coarticulation.

### 3. Examples Across Languages

Language

Example

Type of Accommodation

Effect

English

key /ki:/

Vowel → consonant

/k/ fronted by /i:/

English

too /tu:/

Vowel → consonant

/t/ rounded by /u:/

English

man → [mæn]

Consonant → vowel

Nasalization

Russian

тёмный /tjəmnij/

Consonant → vowel

Fronting by palatal /tj/

French

bon → [bɔ̃]

Consonant → vowel

Nasalization

4. Linguistic Significance Russian exhibits extensive regressive assimilation of voicing in consonant clusters.

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Nasality

Portuguese

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Regressive

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Accommodation is universal in spoken languages and affects both consonants and vowels. It plays a crucial role in speech fluidity, articulatory efficiency, and allophonic variation.

### 2.3 Coalescence of Phonemes

Coalescence is a phonetic process in which two adjacent sounds merge to form a single new segment that combines features of both original phonemes. Unlike assimilation, which creates similarity, coalescence produces a new segment with properties derived from the neighboring sounds. It is a common phenomenon in fast or informal speech, but in some languages, coalescence can become phonologized, forming part of the standard phoneme inventory.

Coalescence demonstrates the dynamic interaction between phonemes and highlights the flexibility and efficiency of spoken language, particularly in connected speech.

Combinatory and positional changes of phonemes form the foundation of phonetic and phonological variation in natural languages. Combinatory processes—such as assimilation, accommodation, and coalescence—demonstrate how adjacent sounds influence one another to optimize articulatory efficiency and maintain smooth transitions. Positional processes—such as reduction, neutralization, and positional allophony—highlight the strong role of prosody, stress, and syllable structure in shaping phoneme realization.

Meaning is preserved: most changes do not affect lexical contrast.

Languages differ yet share universal tendencies: similar processes occur across English, Russian, Uzbek, German, and many others.

Understanding these processes is essential for fields such as phonetics, phonology, language teaching, speech therapy, and speech technology. A comprehensive grasp of combinatory and positional phoneme changes enhances one's ability to analyze language sound systems and to interpret the complex reality of connected speech.

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