https://doi.org/10.36719/2789-6919/40/61-64

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Classification of Speech Sounds in English

Abstract

The classification of speech sounds is a fundamental aspect of phonetics, the branch of linguistics that deals with the physical properties of speech. This study explores the systematic categorization of speech sounds into consonants, vowels, and suprasegmentals based on their articulatory, acoustic, and perceptual characteristics. Speech sounds are classified according to distinctive features such as place of articulation, manner of articulation, and voicing for consonants, and height, backness, and roundness for vowels. Additionally, the analysis incorporates suprasegmental features like pitch, stress, and intonation, which play a crucial role in conveying meaning and emotion. The classification framework emphasizes both theoretical models and practical applications in areas such as speech recognition, language acquisition, clinical phonetics, and linguistic typology. By examining the various approaches to sound categorization, this paper highlights the complexities involved in distinguishing between phonemes and non-phonemic variations, offering a comprehensive understanding of the mechanisms underlying speech production, perception, and variation across languages. The study also addresses the challenges posed by dialectal variation, coarticulation effects, and sound change, thus providing insight into the dynamic and evolving nature of speech sound classification.

Keywords: *phonetics, speech sounds, classification, consonants, vowels, suprasegmentals*

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İngilis dilində nitq səslərinin təsnifatı

Xülasə

Nitq səslərinin təsnifatı nitqin fiziki xassələri ilə məşğul olan dilçiliyin bölməsi olan fonetikanın əsas istiqamətidir. Bu tədqiqat nitq səslərinin artikulyasiya, akustik və qavrayış xüsusiyyətlərinə görə samitlərə, saitlərə və supraseqmentlərə sistemli şəkildə təsnifatını araşdırır. Nitq səsləri samitlər üçün artikulyasiya yeri, artikulyasiya tərzi və səslənməsi, saitlər üçün isə hündürlük, arxa, dairəvilik kimi fərqləndirici xüsusiyyətlərə görə təsnif edilir. Bundan əlavə, təhlil məna və emosiyaların çatdırılmasında mühüm rol oynayan yüksəklik, vurğu və intonasiya kimi supraseqmental xüsusiyyətləri özündə birləşdirir. Təsnifat çərçivəsi həm nəzəri modelləri, həm də nitqin tanınması, dilin mənimsənilməsi, klinik fonetika və linqvistik tipologiya kimi sahələrdə praktik tətbiqləri vurğulayır. Səsin təsnifatına müxtəlif yanaşmaları tədqiq etməklə, bu məqalə fonemlər və qeyri-fonemik variasiyalar arasında fərq qoymağın mürəkkəbliyini vurğulayır, nitq istehsalının, qavrayışın və dillər arasında variasiyanın əsasını təşkil edən mexanizmlərin hərtərəfli başa düşülməsini təklif edir. Tədqiqat həm də dialektal variasiya, koartikulyasiya effektləri və səs dəyişikliyinin yaratdığı çətinlikləri həll edir, beləliklə, nitq səs təsnifatının dinamik və inkişaf edən təbiəti haqqında fikir verir.

Açar sözlər*: fonetika, nitq səsləri, təsnifat, samitlər, saitlər, supraseqmentlər*

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Introduction

Speech sounds, or *phonemes*, form the building blocks of language. In English, these sounds can be classified into two main categories: consonants and vowels. Each category is further divided based on specific features such as articulation, voicing, and manner of production. Understanding these classifications is essential for linguists, language learners, and anyone interested in the study of phonetics and phonology.

Consonants are sounds produced by obstructing or constricting airflow in the vocal tract, whereas vowels are produced with an open vocal tract, allowing air to flow freely. Consonants are often characterized by features like *place of articulation* (where the sound is produced in the vocal tract), *manner of articulation* (how the airflow is modified), and *voicing* (whether the vocal cords vibrate). Vowels, on the other hand, are classified according to the position of the tongue, the shape of the mouth, and the level of openness in the vocal tract (Roach, 2009).

Research

This classification system helps us understand how different speech sounds in English are produced, how they function in communication, and how they interact with each other in various linguistic contexts.

Additionally, it forms the foundation for phonetic transcription, speech therapy, language acquisition, and comparative linguistics.

1. Phonetic Classification

Sounds in English can be categorized based on how they are articulated (their place, manner, and voicing).

A. Consonant Sounds

Consonants are speech sounds that are articulated by blocking or constricting the airflow in some way.

- *Voiced vs. Voiceless*
  - *Voiced Consonants*: These sounds occur when the vocal cords vibrate. Examples include /b/, /d/, /g/, /v/, and /z/.
  - *Voiceless Consonants*: These sounds occur without vocal cord vibration. Examples include /p/, /t/, /k/, /f/, and /s/.
- *Place of Articulation*
  - *Bilabials*: Both lips are used (e.g., /p/, /b/).
  - *Alveolars*: The tongue touches the alveolar ridge behind the upper teeth (e.g., /t/, /d/, /s/, /z/).
  - *Velar*: The back of the tongue touches the soft part of the roof of the mouth (e.g., /k/, /g/) (Ladefoged, 2014).
- *Manner of Articulation*
  - *Stops (Plosives):* Complete blockage of airflow followed by a burst (e.g., /p/, /b/, /t/, /d/).
  - *Fricatives*: Narrow constriction of the airflow, causing friction (e.g., /f/, /s/, /v/, /z/).
  - *Affricates*: A combination of a stop and a fricative (e.g., /ʧ/ as in "ch," /ʤ/ as in "j").
  - *Nasals*: Air escapes through the nose (e.g., /m/, /n/, /ŋ/).

B. Vowel Sounds

Vowels are sounds that are produced with an open vocal tract. Vowels in English are classified based on tongue height, tongue position, and lip rounding (Crystal, 2008).

- *Height*
  - *High vowels*: The tongue is raised toward the roof of the mouth (e.g., /i/ in "beat," /u/ in "boot").
  - *Mid vowels*: The tongue is in a mid-position (e.g., /e/ in "bet," /ɔ/ in "thought").
  - *Low vowels*: The tongue is lowered (e.g., /æ/ in "cat," /ɑ/ in "father").
- *Front, Central, and Back Vowels*
  - *Front vowels*: The tongue is positioned toward the front of the mouth (e.g., /i/, /e/).
  - *Central vowels*: The tongue is positioned in the center of the mouth (e.g., /ʌ/ in "cup").
  - *Back vowels*: The tongue is positioned toward the back of the mouth (e.g., /u/, /o/).
- *Lip Rounding*

- Some vowels are produced with rounded lips (e.g., /u/ in "boot" and /ɔ/ in "thought").
- Others are produced without rounding (e.g., /i/ in "beat" and /æ/ in "cat").

2. Phonological Classification

In addition to phonetic characteristics, English sounds can also be classified based on their function within the language system (Martin, 2002).

A. Phonemes

Phonemes are the smallest units of sound that can distinguish words. In English, there are around 44 phonemes, including both consonants and vowels. For instance, the difference between the words "bat" and "pat" is due to the phonemic contrast between the sounds /b/ and /p/.

B. Allophones

Allophones are variations of a single phoneme. They do not change the meaning of a word, and their occurrence depends on the phonetic environment. For example, the /p/ sound in "pat" is pronounced with a burst of air (aspiration), while the /p/ in "spat" is unaspirated.

3. Suprasegmental Features

Suprasegmental features are characteristics of speech that go beyond individual sounds, affecting entire syllables or words.

- *Stress*
  - Stress refers to the emphasis placed on certain syllables within words or on words within sentences. For example, the word "record" is stressed on the first syllable when used as a noun ("RE-cord") but on the second syllable when used as a verb ("re-CORD").
- *Intonation*
  - Intonation is the rise and fall of pitch in speech, which conveys meaning or emotion. It is particularly important in English for distinguishing between statements and questions.
- *Rhythm*
  - English has a stress-timed rhythm, meaning that stressed syllables occur at roughly regular intervals, while unstressed syllables are shorter and faster.

4. Sources of Sound

Sounds in English come from various sources, which influence how they are produced and perceived.

- *Speech Sounds (Articulatory)*
  - These sounds are produced by the movement and positioning of the articulatory organs, such as the tongue, lips, and vocal cords.
- *External Sound Influences*
  - English sounds are also influenced by the context of the surrounding sounds. For example, assimilation occurs when sounds become more like neighboring sounds (e.g., "input" pronounced as "imput" in casual speech) (Clark, Yallop, Fletcher, 2007).

5. Types of English Sounds Based on Their Role in Syllables

In addition to the general phonetic classification, sounds can be categorized based on their roles in syllables.

- *Onset*: The consonant or consonants that begin a syllable (e.g., the /k/ in "cat").
- *Nucleus*: Typically the vowel or vowel-like sound that forms the core of the syllable (e.g., the /æ/ in "cat").
- *Coda*: The consonant or consonants that end a syllable (e.g., the /t/ in "cat").

Conclusion

The classification of sounds in English involves a detailed understanding of how sounds are produced, their phonological roles, and their functional characteristics. Whether looking at the physical properties of consonants and vowels or considering more abstract features like stress and intonation, understanding these distinctions is key to mastering both spoken and written English.

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Received: 01.10.2024
Submitted for review: 22.10.2024
Approved: 25.12.2024
Published: 30.12.2024