

## Chapter 5: *Phonological structure: The Phoneme and its allophones. Segmental specification: Distinctive Features in various phono-logical theories*

- 5.1. [Individual sounds and classes of sounds. The phoneme and its contrastive function](#)
- 5.2. [Allophones. Complementary distribution and free variation](#)
- 5.3. [The phonological idiosyncrasy of linguistic systems](#)
- 5.4. [Broad and narrow transcription](#)
- 5.5. [Segmental and suprasegmental phonemes](#)
- 5.6. [From the minimal unit of linguistic analysis to the bundle of distinctive features](#)
- 5.7. [Jakobson and Halle's feature system](#)
- 5.8. Chomsky and Halle's distinctive features
- 5.9. [Ladefoged's feature system](#)
- 5.10. [The use of features for segmental specification and for the description of phonological processes](#)

### 5.8. Chomsky and Halle's distinctive features

Within a fundamentally different theoretical framework many of the distinctions proposed by Jakobson and Halle can be recognized in Noam Chomsky and Morris Halle's *Sound Pattern of English* (1968), a book that represented a turning point in the development of phonological theory in the 20<sup>th</sup> century. The phonological analysis is carried out from a generative perspective, which radically modifies the interpretations of the phonological processes. The task of the phonologist was not longer to identify and classify the elements in a given corpus, but rather to devise a system of rules that explain the phonological structure of sentences and the phonological changes undergone by various segments. The classical variant of American Structuralism, often called Item and Arrangement phonology was repudiated in favour of a flexible system that should allow the linguist to explain the phonological structure of a given language. From essentially classificatory and descriptive, the model tends to become explanatory. Generative transformational grammar was a later development of earlier structuralist theories in the 20<sup>th</sup> century, of which it is in many ways a continuation, but from which it essentially departs in some fundamental aspects. At the time when SPE was published, most generativists would still accept the standard model of the late fifties and early sixties which considered the syntactic component as central within grammar while the semantic and phonological components were interpretative ones. The phonological component was structured much like the syntactic one. An *underlying representation* was postulated which consisted of a string of highly abstract phonological segments that were converted by *phonological rules* into *surface representations* that mirrored pretty faithfully the actual pronunciation of phonetic sequences. We will come back later in this chapter to this type of interpretation of phonological changes. The features used by Chomsky and Halle were defined primarily in articulatory terms and not in acoustic ones as they were

in the Jakobsonian model. This was not a return to the ‘tradition’, but a reinterpretation of most of Jakobson’s features. Chomsky and Halle themselves argue that the priority given to an articulatory description is a circumstantial one rather than one pertaining to the essence of their theoretical approach (1968: 299). The features – more numerous than Jakobson’s – were subdivided into five groups.

1. Major class features:
  - a) sonorant/nonsonorant (obstruent)
  - b) vocalic/nonvocalic
  - c) consonantal/non-consonantal
2. Cavity features:
  - a) coronal/noncoronal
  - b) anterior/nonanterior
  - c) body of the tongue features:
    - 1) high/nonhigh
    - 2) low/nonlow
    - 3) back/nonback
  - d) rounded/nonrounded
  - e) distributed/nondistributed
  - f) covered/noncovered
  - g) glottal constrictions
  - h) secondary apertures:
    - 1) nasal/nonnasal
    - 2) lateral/nonlateral
3. Manner of articulation features:
  - a) continuant/noncontinuant (stop)
  - b) instantaneous/delayed release
  - c) supplementary movements
    - 1) suction
    - 2) pressure
  - d) tense/nontense (lax)
4. Source features:
  - a) heightened subglottal pressure
  - b) voiced/nonvoiced
  - c) strident/nonstrident
5. Prosodic features:
  - a) stress
  - b) pitch
  - c) length

Here follows a brief presentation of the SPE distinctive features:

1. *Major class features* dealt with the fundamental *vocalic/nonvocalic* and *consonantal/nonconsonantal* distinctions. As explained earlier in this book, the distinction suggested by Chomsky and Halle was essentially an articulatory one: the uttering of vowels did not involve any major obstruction in the way of the airstream,

while a major constriction at some point along the vocal tract was always associated with the articulation of consonants. Just as with Jakobson, liquids were described as being [+consonantal; +vocalic], glides were [-consonantal; -vocalic], a combination of features that also characterized the glottal fricative **h** and the glottal stop ?

The distinction *sonorant/obstruent* was introduced the former being described as sounds allowing spontaneous voicing. Vowels, glides, liquids and nasals were naturally included, though it is not clear why **h** and the glottal stop received the same specification. A refinement of these features is suggested in the epilogue of the book where vowels are described as syllabic and *vocoid* (vowel-like in nature) while glides are characterized as *non-syllabic* and *vocoid*. Thus, the articulatory similarity between vowels and glides is captured, the difference being one of distribution (in the position of syllable nuclei – see the chapter on syllable).

*Syllabic/nonsyllabic*. Consonants are described as *contoids* (consonant-like in nature) and vowels as *vocoids* while the same distinction *syllabic/nonsyllabic* that differentiated between vowels and glides operates in the case of consonants too. It keeps apart *syllabic* consonants (nasals and liquids) and *nonsyllabic* ones (the true consonants or obstruents). We must mention that +/- *syllabic* is a different type of feature since it refers to the possibility of occurrence (distribution) of a sound in a given position (context) – i.e. syllable nucleus. That is why the introduction of this feature was considered by many phonologists to be a shortcoming of the SPE system as it is based on a criterion that differs from the mainly articulatory criteria that operate in the case of the other features.

## 2. *Cavity features* were essentially place of articulation features.

- a) *Coronal* sounds (a new feature actually originating in Jakobson's *grave/acute* opposition) were defined as sounds produced with the blade of the tongue raised from the neutral position (dental, alveolar, palato-alveolar consonants).
- b) *Anterior* sounds (another apparently new feature, which can, however, be associated to Jakobson's *compact/ diffuse* one) were sounds produced in front of the palato-alveolar region.
- c) The *body of the tongue features* actually distinguished among vowels having different degrees of aperture as a result of the higher or lower position of the tongue in the mouth. It was, however, extended, not very convincingly, to [-*anterior*; -*coronal*] consonants and, as it was obvious that it was irrelevant for coronal and anterior sounds, the authors argued that it could be at least used to describe "subsidiary consonantal articulations such as palatalization, velarization and pharyngealization".
- d) The feature *rounded/unrounded* made a distinction between sounds (primarily vowels) pronounced with either rounded or spread lips.
- e) The feature *distributed/nondistributed* differentiated between sounds produced with a constriction that extends for a considerable distance along the direction

of the air flow, and sounds articulated with a constriction that extends only for a short distance in the direction of the air flow. Apical from laminal and retroflex from nonretroflex consonants, respectively are thus distinguished.

- f) The feature *covered/noncovered* refers to the position of the pharyngeal walls: in the case of covered sounds the walls are narrowed and tensed, while noncovered sounds are articulated without such a narrowing or tensing.
  - g) *glottal constrictions* involve the complete closure of the glottis.
  - h) The features involving *secondary apertures* mainly differentiate between:
    - 1. *nasal/nonnasal* sounds, the opposition being based on the different cavities nasal and oral respectively through which the air is released.
    - 2. *lateral/nonlateral* sounds, the opposition being again based on the type of release: the air is or is not allowed to flow laterally.
3. *Manner of articulation features* essentially distinguished between stops and fricatives on the one hand and plosives and affricates on the other.
- a) *continuant/noncontinuant*. Continuant sounds are produced with a primary constriction that does not entirely block the air flow, while the articulation of noncontinuant sounds (stops) involves such a complete closure.
  - b) *instantaneous release/delayed release* is a feature that keeps apart plosives from affricates. It refers then to sounds produced with a complete closure of the tract, but which differ in the manner of the release: instantaneous or abrupt in the case of plosives and delayed in the case of affricates.

The two features then combine to describe the respective consonant classes. Stops are characterized as [-*continuant*; +*instantaneous release*], while fricatives are [+*continuant*] and affricates are [-*continuant*; +*delayed release*].

- c) supplementary movements characterise sounds articulated with two simultaneous closures, such as clicks, the labiovelars or the glottalized sounds.
- d) The feature *tense/lax* parallels the feature *long/short* in vowels and *voiceless/voiced* in consonants. It describes the higher or lower muscular articulatory effort required by the uttering of the respective sound.

#### 4. Of the *source features*

- a) the *heightened subglottal pressure* feature accounts for aspiration in the tense voiceless stops.
- b) *voiced/unvoiced* is a fundamental feature characteristic of sounds in any language and has already been discussed in detail.
- c) the feature *strident/nonstrident* was described as being “marked acoustically by greater (or lower) noisiness” and restricted to obstruent continuants and affricates. Of the former class, the dental fricatives of English are nonstrident, while the alveolar ones are strident.

5. *Prosodic features* were only listed, without being described since as the authors put it, “our investigations of these features have not progressed to a point where a discussion in print would be useful”.

Most of Chomsky and Halle’s features are still widely used in phonological theory even at present. Phonologists have, however, become increasingly aware of the inadequateness of the binary principle especially in the situations when a more refined analysis of a phonological reality was needed. Even with Chomsky and Halle some of the features were not binary and a feature like *syllabic* was of a totally different nature as pointed out above. Instead of the initial polarities, hierarchies or scales were built to more accurately describe the characteristics of phonemes. In order to explain syllable constituency, the initial binary opposition *obstruent/sonorant* was abandoned in favour of a scale of sonority (see the chapter on syllable).