

Phonology III: Features

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Features

- **Features**

= are the most basic units of phonology.

= like atoms they are basic building blocks of speech sounds.

= they are phonetically grounded elements.

Features



Segments (speech sounds)



Syllables

Patterns of Patterns

- Sometimes, the rules for one phoneme's distribution are identical to the rules for another phoneme's distribution.
- /t/ → [t] / after [s]
/t/ → [t^h] / at the beginning of stressed syllables
[t^hap] 'top' [stap] 'stop'
- /p/ → [p] / after [s]
/p/ → [p^h] / at the beginning of stressed syllables
[p^hæt] 'pat' [spæt] 'spat'
- /k/ → [k] / after [s]
/k/ → [k^h] / at the beginning of stressed syllables
[k^hɑ:] 'car' [skɑ:] 'scar'

Natural Classes

- The same rules apply to /p/, /t/, and /k/. Why?
- /p/, /t/, and /k/ form a **natural class** of sounds in English.
 - They are all voiceless stops
 - No other sounds in English are voiceless stops
- A **natural class** is a set of sounds in a language that:
 - Share one or more (phonetic) features
 - *To the exclusion of all other sounds in that language*
 - ...and function together in phonological rules (behave similarly).
- The phonetic “features” primarily include the phonetic labels we’ve already learned.
 - ...although we’ll need to make some additions.

Natural Class Examples

- For instance, in English:
 1. [k], [g], [ŋ] form the natural class of velar stops
 2. [u] and [o] form the natural class of rounded, tense vowels.
- What natural classes are formed by the following groups of sounds?
 - [t], [s]
 - [v], [ð], [z], [ʒ]
 - [ɪ], [ɛ], [æ]

Phonological Problem: Arabic

Enter [CORONAL]

- There are a few features in phonology that are more general than the ones we find in phonetics.
- For instance: the Arabic Sun and Moon letters.
 - What's the pattern?
- The "Sun letters" include alveolars, alveopalatals, and interdental
 - = sounds made with the front part of the tongue
- The "Moon letters" include everything else.
- [CORONAL] is a feature - a cover term for alveolars, alveopalatals, and interdental

Feature types

1. Major class features
2. Manner features
3. Laryngeal features
4. Articulator features

Major class features

3 major class features

1. [\pm consonantal]:

- [+consonantal] = produced with a major obstruction – all consonants except for [h] and [ʔ]
- [-consonantal] = glides, vowels, and [h] and [ʔ]

2. [\pm sonorant]:

- [+sonorant] = sounds that resonate (are singable) when produced – vowels, glides, liquids, and nasals
- [-sonorant] = all obstruents (stops + fricatives)

3. [\pm syllabic]:

- [+syllabic] = sounds that can be syllabic nuclei – vowels, syllabic liquids, and syllabic nasals
- [-syllabic] = the rest

Feature matrix

/d/

binary

[+consonantal
-sonorant
-syllabic]

Major Class Features
= allow us to group sounds into
vowels, consonants, and glides

Manner features

4 Manner features

1. [\pm continuant]:

- [+continuant] = sounds produced with free or nearly free airflow – vowels, glides, liquids, and fricatives
- [-continuant] = nasal and oral stops, and affricates

2. [\pm delayed release]:

- [+DR] = sounds produced with a slower release – [tʃ] and [dʒ]
- [-DR] = all other sounds

3. [\pm nasal]:

- [+nasal] = sounds produced with a lowered velum – nasal stops
- [-nasal] = all other sounds (oral sounds)

4. [\pm lateral]:

- [+lateral] = [l], when air is escaping along the sides of the tongue
- [-lateral] = all other sounds

Feature matrix

/d/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-DR
-lateral

/l/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-DR
+lateral



Distinctive feature = A feature that is able to signal a difference in meaning by changing its plus or minus value

Laryngeal Features

3 laryngeal features – represent the activity of the larynx

1. [\pm voice]:

- [+voice] = voiced sounds
- [-voice] = voiceless sounds

2. [\pm spread glottis]:

- [+SG] = aspirated consonants
- [-SG] = the rest

3. [\pm constricted glottis]:

- [+CG] = only [ʔ] in English
- [-CG] = the rest

Feature matrix

/d/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-lateral
-DR
+voice
-SG
-CG



/dʒ/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-lateral
+DR
+voice
-SG
-CG

Articulator features

3 main articulator features which are non-binary.

1. [LABIAL]

2. [CORONAL]

3. [DORSAL]

- Each main feature has sub-features which are binary.

Articulator features

[LABIAL] – sounds produced with lips

1. [±round]:

- [+round] = labial sounds produced with protruding lips – rounded vowels and [w]
- [-round] = labial sounds with no lip protrusion – [p,b,f,v,m]

Articulator features

[CORONAL] – sounds produced with front of the tongue

1. [±anterior]:

- [+anterior] = coronal sounds produced in front of the alveopalatal region (interdentals and alveolars)
- [-anterior] = coronal sounds produced at the alveopalatal region (alveopalatals)

2. [±strident]:

- [+strident] = all 'noisy' coronal fricatives and affricates ([s, z, ʃ, ʒ, tʃ, dʒ])
- [-strident] = all other coronal fricatives and affricates ([θ, ð])

Articulator features cont'd

[DORSAL] – sounds produced with the body and back of the tongue

1. [±high]:

- [+high] = Dorsal sounds produced with the tongue body raised
- [-high] = Dorsal sounds with neutral or lowered tongue body

2. [±low]:

- [+low] = *Vowels* produced with the tongue body lowered
- [-low] = all other *vowels*

3. [±back]:

- [+back] = Dorsal sounds produced with the tongue body behind the palatal region
- [-back] = Dorsal sounds produced with the tongue body in front the palatal region

Articulator features cont'd

[DORSAL]

4. [\pm tense]:

- [+tense] = vowels that are tense
- [-tense] = vowels that are lax

5. [\pm reduced]:

- [+reduced] = vowel [ə]
- [-reduced] = all other vowels

Feature matrix

Feature matrix

/d/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-lateral
-DR
+voice
-SG
-CG
CORONAL
+anterior
-strident



/z/

+consonantal
-sonorant
-syllabic
-nasal
-continuant
-lateral
-DR
+voice
-SG
-CG
CORONAL
+anterior
+strident

Feature matrix

/b, p, d, t, tʃ, dʒ, ʔ/

+consonantal

-sonorant

-syllabic

-nasal

-continuant

Why should we care?

- Features are considered to be the basic building blocks of language.

Sentences

Words

Morphemes

Phoneme

Features

- The set of features is therefore universal.
- The distinctive features determine:
 - What contrasts a sound makes with other sounds.
 - What natural classes a sound belongs to.

Why should we care cont'd?

- Phonological rules can (and should) always be expressed in terms of distinctive features.
- For instance, voicing assimilation for English plurals:

Rule:

$\left[\begin{array}{l} +\text{voice} \\ +\text{continuant} \\ \text{CORONAL} \\ +\text{anterior} \\ +\text{strident} \end{array} \right] \rightarrow [-\text{voice}] / [-\text{voice}] \underline{\hspace{1cm}}$