

Feature review; natural classes

(1) **Distinctive feature:** an articulatory/acoustic property that classifies speech sounds

(2) **Some examples:**

Feature name	Defining properties	[+F]	[-F]
[nasal]	Velum position	Velum down m, n, ŋ, ã, ě, õ, ȷ, ȷ̃...	Velum up b, d, g, a, e, o, j, r...
[voice]	Vocal chord vibration	Yes b, d, g, v, z, ʒ, vowels, nasals, l, r, glides	No p, t, k, s, ʃ, f, h
[aspirated] ([spread glottis])	Glottis held wide open	Yes h, p ^h , t ^h , k ^h , voiceless fricatives	No All others
[coronal]	Tip or blade of tongue involved in articulation	Tip/blade involved t, s, ʃ, θ, l, n...	Tip/blade not involved p, k, h, a, w, j...
[anterior]	Constriction site relative to alveolar ridge	At or in front of ridge p, f, t, s, θ, d, l, m, n	Behind ridge k, ʃ, tʃ, j, ŋ, ʈ, λ
[lateral]	Sides of tongue position	Lowered l, ɫ, ɮ, λ	Not lowered All others, incl. r
[consonantal]	Contact between articulators or significant narrowing of vocal tract	Yes Stops, fricatives, affricates, nasals, l, varieties of [r]	No Vowels, glides (j, w), h, ʔ
[continuant]	Airflow through mouth	Yes Fricatives, laterals, r, glides, vowels, h	No Stops, affricates, ʔ
[syllabic]	Center or margin of syllable	Center Vowels, r, m, n, l, ʃ	Margin Glides, other C's
[sonorant]	Continuity of spectrum amplitude in F1-F2 region	Continuity Nasals, laterals, r, glides, vowels	Discontinuity Stops, fricatives, affricates, glottal stop
[back]	Site of tongue body constriction	Back u, o, ʊ, ɑ, ɔ, w and uvulars (q, ʀ)	Front i, e, y, æ, j

Feature name	Defining properties	[+F]	[-F]
[round]	Lip pursing	Yes o, ɔ, u, ʊ, y, w, k ^w	No All others
[low]	Jaw position	Lowered a, æ, ɑ	Not lowered All others
[high]	Tongue body vertical position	Raised i, u, y, ɯ, j, w, velar C's	Not raised All others

(3) **Speech sounds** are bundles of distinctive features.

(4) **Some common sound classes described by feature combinations:**

mid vowels (e, o):	[-high, -low]
stops (p, t, k):	[-son, -cont]
liquids (laterals and r-sounds):	[+son, +consonantal, -nasal]
glides:	[-cons, -syllabic]

(5) **Some properties of distinctive features:**

- They are binary: [+F] and [-F].
- Most segments have some value for every feature.
- Features are universal: sounds of all languages are describable by using the same feature set.
- Rules apply to features or feature groups, not lists of sounds.

(6) **How distinctive features help the analysis:**

- They reveal the basic similarity between processes that appear to be quite different.
- They permit an explanation of the fact that certain processes are widespread, while others are infrequent or non-existent.
- They explain how speakers extend phonological processes to non-native sounds.

(7) **English consonants:**

p t tʃ k m n l
b d dʒ g
f s ʃ
v z ʒ w r y h

vs.

Ancient Greek consonants:

p t k m n l
p^h t^h k^h
b d g
s r

(8) **Similarities between the Greek and English C systems:**

- sonorants cannot precede obstruents at the beginning of syllables
e.g. no words like **mbro**, **rpa**, **lsi** in either language
- aspiration (h and C^h in English and C^h in Greek) is only allowed syllable-initially.
e.g. no words like [p^hæh], [rɪp^h], [æt^h.læs] in either language

Therefore all sets of sounds that undergo or condition a rule can be described by a shared feature value or a set of shared feature values.

Moral: if your rule applies to a non-natural class (e.g. {m, i, t} → Ø/ #__) then either:

You don't have the right rule and must revise the analysis (most common)

An adjustment must be made to the theory of distinctive features (very uncommon).

(17) Biblical Hebrew

Perfect	Imperfect	Gloss
ba:har	ji-vhar	choose
ga:nav	ji-ynov	steal
da:raʃ	ji-ðroʃ	inquire
pa:yaʃ	ji-fgoʃ	meet
ka:θav	ji-xtov	write

Hebrew rule:

Natural classes:

(18) Arabic assimilation in nouns with *al-* 'the'

Intact <i>al</i>		Assimilated <i>al</i>	
ʔal-qamr	the moon	aʃ-ʃams	the sun
ʔal-faras	the mare	ʔad-da:r	the house
ʔal-kita:b	the book	ʔaz-zajt	the oil
ʔal-harb	the war	ʔan-nahr	the river
ʔal-ʔab	the father	ʔaθ-θawb	the garment

Arabic rule:

Natural classes: