

Distinctive Features – Consonants

Traditionally /p/ = voiceless bilabial plosive (= voicing place manner).

Many people suggest that phonemes do not exist: they are just short-hand for a co-occurrence of a set of features.

Features are needed so that rules can make reference to classes of sounds (Carr, 1993:54).

Binary Features

Voicing is binary : [+voice] or [-voice]

What about place and manner?

place : bilabial labiodental dental alveolar palato-alveolar palatal velar glottal

manner : plosive fricative affricate nasal lateral approximant

How can these be reduced to binary features?

Place

We use two features: [anterior][coronal]

front of mouth = [+anterior]

back of mouth = [-anterior]

top of mouth = [+coronal]

not top of mouth = [-coronal]

(Carr, 1993:60 : [+coronal] = “articulated with the blade of the tongue raised above its neutral position”)

Fill in the grid for the English fricatives.

	f	v	θ	ð	s	z	ʃ	ʒ	h
coronal									
anterior									
voice									

Which ones still cannot be differentiated?

Strident : [+stri] sounds "have high frequency noise" (Carr, 1993:57).

Carr (1993) regards /f, v/ as strident. This agrees with Chomsky and Halle (1968). Others disagree. See Laver (1994:260-2).

The plural -s morpheme is pronounced as /ɪz/ after a [+stri +cor] consonant. If /f, v/ are regarded as [-stri], then the plural morpheme is /s/ after any [+stri] consonant.

Manner

We need to reanalyse : plosive, fricative, affricate, nasal, lateral, approximant

Obstruents : have blockage somewhere in the vocal tract, so that "the passage of air from the lungs is obstructed in some way" (Richards & Schmidt, 2002:372). Plosives, fricatives and affricates are [+obs].

Sonorant : carrying greater amount of sound (Roca & Johnson, 1999:59) "produced with a relatively free airflow" (Crystal, 2003:423).

But [+obs] = [-son] → one of them is redundant.

We will use [obstruent] (Carr, 1993:56).

Others use [sonorant] (Roca & Johnson, 1999:88).

Continuant: involving no complete blockage in the mouth. Which sounds are [+cont]?

Fill in the grid for the following voiced consonants.

	b	m	v	ð	d	n	z	ʒ	dʒ	g	ŋ
voice											
obstruent											
continuant											
anterior											
coronal											
strident											

Which ones still cannot be distinguished?

We will use [delayed release] for something that is both plosive and fricative.

Fill out the grid for the voiced fricatives and affricate:

	v	ð	z	ʒ	dʒ
voice					
obstruent					
continuant					
del rel					
anterior					
coronal					
strident					

Consonants, Vowels and Approximants

Consonantal

[+cons] sounds have “a radical constriction in the vocal tract” (Carr, 1993:55).
Approximants are [-cons].

Syllabic

[+syll] sounds function as the nucleus of the syllable. All vowels are [+syll].

All consonants are [-syll] but they are sometimes converted to [+syll] by rule.

The full grid (Carr, 1993:65-6)

	p	b	m	w	f	v	θ	ð	t	d	n	l	s	z	r	ʃ	ʒ	tʃ	dʒ	j	k	g	ŋ	h
cons	+	+	+	-	+	+	+	+	+	+	-	+	+	-	+	+	+	+	-	+	+	+	+	+
syll	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
voice	-	+	+	+	-	+	-	+	-	+	+	+	-	+	+	-	+	-	+	+	-	+	+	-
obs	+	+	-	-	+	+	+	+	+	+	-	-	+	+	-	+	+	+	+	-	+	+	-	+
cont	-	-	-	+	+	+	+	+	-	-	-	+	+	+	+	+	+	-	-	+	-	-	-	+
del rel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-
lat	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
nas	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+
ant	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
cor	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
stri	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-	+	+	+	+	-	-	-	-	-

Notes:

- /w/ is a problem. It has dual articulation (labial + velar), so it really should be both [+ant] and [-ant].
- /r/ is [+ant] even though it is palato-alveolar in English, because Carr (1993) is showing an alveolar trill, not the English approximant

Exercises

1. How can the approximants /j, w, r, l/ be represented?
2. What about the liquids /r, l/?
3. What about the plosives?
4. What about the fricatives?
5. What class of sounds does [-cor +ant] refer to?
6. What class of sounds does [+voice +obs -cont] refer to?

Feature Co-occurrence Restrictions (FCR)

(Carr, 1993:76)

Some feature specifications are redundant. We can use a FCR, eg:

[+nas] → [+voice]

Explain this in words. Why do you think there are no voiceless nasals? Do you think this is universal or language-specific?

What other dependency rules can you see? Look for instance at the affricates.

References

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