Introduction to Phonological Analysis **Handout 6 (Sept. 19)**
LING 232A/632A, Fall 2013
Tamás Biró

Theme: Features (cont'd).
Based on: Hayes, 2009, chapter 4.

1. From the IPA charts to features… or rather vice versa

"Axiom of binarity": at least in SPE-style, features take either + or – values, unless they do not take any.

How to "binarize" dimensions with more than two levels? And why is it good to do so?

Step 1: From continuous levels in phonetics to discrete levels in phonology.
How many needed? As many as in IPA? Do specific languages really make all those distinctions?

Step 2: Approach 1: find contiguous subsets of the scale: a. {+ + + - - - -} b. {- - - + + + - }
Approach 2: Turn it into a *square of opposition* { [++] [+-] [-+] [--] }

Question: Are you convinced? What do you need to be convinced?

2. Features for vowels

a. Rounding: [round] *rounded* [+round] vs. *unrounded* [-round].

b. Backness: [back] *front* [-back] vs. *back* [+back].
[back] [front] *front* [-b, +f] vs. *central* [-b, -f] vs. *back* [+b, -f]. ([+b,+f]?)

c. Height: many languages with 2 or 3 levels. Some with 4 or 5 levels. IPA chart: 7 levels!
[high] [low] *high* [+hi, -lo] vs. *mid* [-hi, -lo] vs. *low* [-hi, +lo].

d. Tenseness: [tense] *tense* [+tense] ([i], [e]) vs. *lax* [-tense] ([ɪ], [ɛ]). A.k.a. [ATR]?

e. Nasalizations: [nasal] *nasalized* [+nasal] vs. *non-nasalized* [-nasal].
That's a feature borrowed from the consonants. Q: reason for using the same feature?

Furthermore: SPE 1968 also had [±long] and [±stress]. Nowadays, we prefer other approaches.
What about diphthongs?

3. Features for consonants

a. Manner features: based on the **sonority hierarchy**

greater sonority ← **→ less sonority**

vowels			**glides**	**liquids**	**nasals**	**obstruents**		
a	*e, o*	*i, u*	*j, w*	*l, r…*	*m, n…*	*fricatives*	*affricates*	*stops*
[+syllabic]			[-syllabic]					
[-consonantal]			[+consonantal]					
[+approximant]					[-approximant]			
[+sonorant]						[-sonorant]		
[+continuant]					[-continuant]	[+continuant]	[-continuant]	
[0 delayed release]						[-delayed release]		[+dd.r.]

Notes: Q: Are glides consonants / consonantal? Are vowels approximants? In what sense?
[+consonantal] segments can be turned into [+syllabic]. Q: glides why not?
Traditional terminology (not reflected in this table): *sonorants* vs. *obstruents* within consonants.
[-continuant] are also called *occlusive.* The notion *stop* or *plosive* may sometimes also include nasals.

b. Place features: primarily, based on *active articulator*, secondarily on *passive articulator.*

bilabials	labiodentals	dental	alveolar	postalveolar	palatal	velar	uvular	pharyngeal
p,b,m	f,v	θ, ð	t, d, s, z, n	ʃ, ʒ, ʧ, ʤ	c, ɟ, ɲ	k, g, ŋ	q, ɢ, ʀ, χ	ħ, ʕ
[+labial]		[-labial]						
[-coronal]		[+coronal]				[-coronal]		
[-dorsal]					[+dorsal]			
[-lbiodnt]	[+labiodental]	[-labiodental]						
[0 anterior]		[+ anterior]		[- anterior]		[0 anterior]		
[0 distributed]		[+dstr]	[-distribt'd]	[+distributed]		[0 distributed]		
[0 back]					[-back]		[+back]	
[0 low]					[-low]			[+low]

Additionally: sibilants [s, z, ʦ, ʣ, ʃ, ʒ, ʧ, ʤ, ʂ, ʐ] are [+strident].
[l, ɬ, ɮ, ɭ, ʎ, ʟ] are [+lateral].

Everything else: [-strident] or [0 strident]. Everything else: [-lateral]. Q: difference between – and 0?

c. Laryngeal features:

[voice]	voiced vs. unvoiced consonants
[+spread glottis]	[h, ɦ, ʍ]
[+constricted glottis]	glottal stop [ʔ], ejectives, preglottalized sounds, etc.
[+implosive]	

d. Features for secondary articulation: using vowel features (Q: why?)

Labialization (with rounded lips)	[ʷ]	add [+round, +labial]
Palatalization	[ʲ]	add [+dorsal, +front, -back, +high, -low]
Velarization	[ˠ]	add [+dorsal, -front, +back, +high, -low] (cf. to back velars)
Pharyngealization	[ˤ]	add [+dorsal, -front, +back, -high, +low]
Aspirated consonants	[ʰ]	add [+spread glottis]

4. Rewrite rules (cont'd) A → B / C_D

That's a *context sensitive rewrite rule* on formal language theory: CAD → CBD.

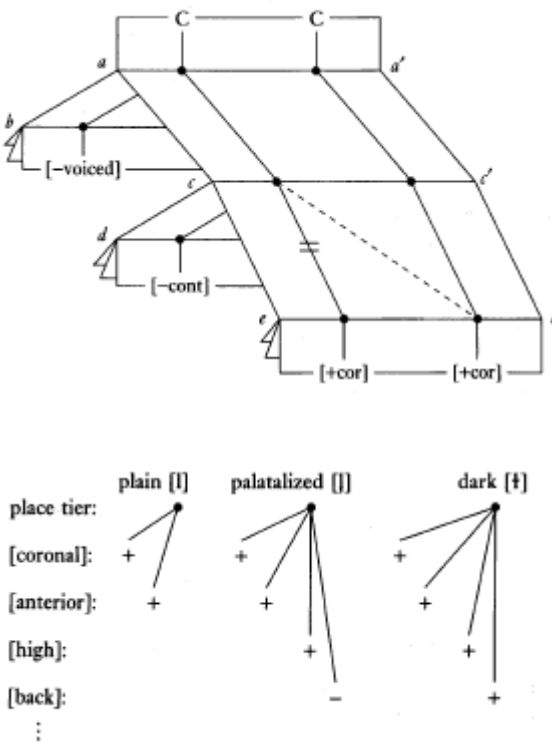
- optionality (or probabilistic / stochastic rule application)
- vacuous application
- Each of A, B, C and D can be Ø.
- In SPE phonology, A, B, C and D are (theoretically) feature matrices
- Features are binary. Or tertiary (allowing 0)? Some theories prefer unary features.
- Variables: [α voice]
- Feature sets: [α place]

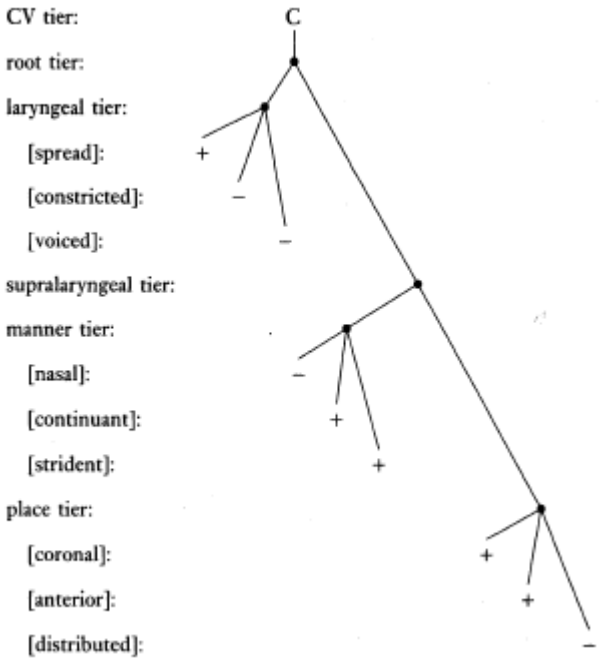
5. Feature geometry: another type of representation, another "data structure" for phonological theory

Structuralist phonology: segment = an atomic unit, a letter from an IPA-like alphabet.

SPE-phonology: segment = a feature "matrix", an unorganized bunch of feature-value pairs.

Feature geometry: segment = a feature "tree", and SPE-features are the leaves.
Non-terminal nodes are groups of feature (place, manner, etc.)





From G. N. Clements (1985): The Geometry of Phonological Features. Reproduced in John A. Goldsmith (ed.): *Phonological Theory: The Essential Readings*, Blackwell: Oxford, 1999.

Reading for Tuesday: Kenstowicz, chapter 2; Hayes, chapters 5 and 6.

Homework: *Hayes*, pp. 100-101, exercise 2. Kenstowicz, pp. 84-85, excercise 2.7/ A and B.