

# Introduction to Linguistics

## Phonology 2

### Distinctive Features

- distinctive features can be used to distinguish different phonemes from each other
- there is a limited inventory of possible sounds, therefore a limited number of features
- features are universal - all languages share the same set of distinctive features (voicing, nasality, etc)
- relationships among phonemes that form a class - bilabial sounds, voiced sounds, fricatives, etc.
- accounts for various processes, e.g. assimilation, harmony (spreading), etc.

### Major Class Features

- [Cons(onantal)]: produced with a close constriction in the oral cavity
  - sustained vocal tract constriction at least equal to that required in the production of fricatives (contact or near contact in vocal tract)
- [Syl(labic)]: sounds which function as syllable nuclei
  - segments constituting a syllabic peak (= head of syllable)
- [Son(orant)]: produced with a high degree of acoustic energy
  - with a vocal cavity disposition which makes spontaneous voicing easy
  - relatively free air passage either through mouth or nose
- these three features provide the following distinctions among the sounds of language:

	Cons	Son	Syl
Obstruents	+	-	-
Nasals/Liquids	+	+	-
Glides	-	+	-
Vowels	-	+	+
Syl. Sons.	+	+	+

### Manner Features

- [Cont(inuant)]: sounds made without completely blocking the flow of air, e.g. fricatives, glides, liquids, vowels; stops, affricates, nasals are [-continuant]
- [Nasal]: air passes via nasal cavity; lowering of velum, e.g. [m], [n], etc.
- [Lat(eral)]: distinguishes sounds made with the side of the tongue approaching or contacting the sides of the oral cavity, e.g. /l/; most useful in distinguishing /l/-sounds from /r/-sounds

### Laryngeal Features

- [Voiced]: periodic vibration of vocal cords
- [Spread Glottis]: aspirated sounds generated with the vocal cords apart, producing non-periodic (noise) component in acoustic signal
- [Constricted Glottis]: produced with vocal cords drawn together (glottalized sounds)

### Strident

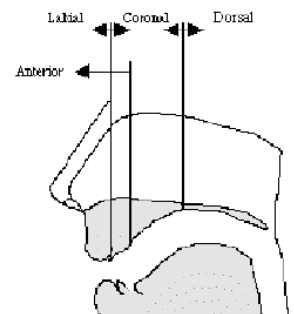
- [Strident]: produced with complex constriction forcing the airstream to strike two surfaces, producing high-intensity fricative sounds

[+strident]		[-strident]
[f] [v]		[ɸ] [β]
[s] [z]		[θ] [ð]
[ʃ] [ʒ]		

### Cavity Features

- position in mouth: Anterior, Coronal, Labial, Dorsal
- [Anterior]: produced with an obstruction that is located in front of the palato-alveolar region
- [Coronal]: produced with the blade of the tongue raised from its neutral position towards teeth or hard palate: from dental to alveo-palatals
- [Labial]: produced with an obstruction that is located at the lip(s)
- [Dorsal]: produced with an obstruction made with the back of the tongue

	p	t	tʃ	k
Ant	+	+	-	-
Cor	-	+	+	-
Labial	+	-	-	-
Dorsal	-	-	-	+



### [Distributed]

- produced with a constriction that extends for a considerable distance along the direction of the air flow
  - useful for distinguishing among the fricatives:

	f/v	θ/ð	s/z	ʃ/ʒ
[Distrib]	-	-	-	+

## Vowel Place Features

- neutral position of body of tongue = assumed to be relaxed and central, approximating the configuration found in schwa (as in English 'sofa')
- [High]: produced by raising body of tongue above level it occupies in neutral position
- [Back]: produced by retracting body of tongue from neutral position
- [Low]: produced by lowering body of tongue below level it occupies in neutral position

## The Rules of Phonology

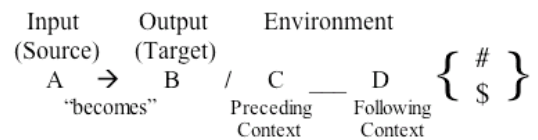
- in order to explain the kinds of changes that take place in phonology we employ rules
- rules are formal mechanisms that cause various changes in phonological structure
- there are a number of types of such changes, including: assimilation, dissimilation, insertion, deletion, etc.

## Assimilation Rules

- assimilation (Latin *ad + simil* 'same') refers to a process of one sound becoming more *similar* to an adjacent sound, either before or after it
- *vowel nasalization*: nasalize vowels before nasals in the same syllable, e.g. *tone* [tõʊn]
- *nasal assimilation*: a nasal consonant changes its place of articulation, e.g. *in-accurate* vs. *im-possible*
- *regular plural assimilation*: the regular plural /-z/ agrees in voicing with the preceding

## Formal Rules

- there is a special notation for making formal phonological rules:
- → means 'becomes' or 'is changed into'
- / marks what follows as the environment of context where a rule takes place
- \_\_\_ indicates site of the change
- # marks the boundary of a word, beginning or end
- \$ marks the syllable boundary



## Environment

- in order to indicate the environment of a rule, certain conventions are followed
- to indicate the beginning of a word: # \_\_\_ D
- to indicate the end of a word: C \_\_\_ #
- to indicate the beginning of a syllable: \$ \_\_\_ D
- to indicate the end of a syllable: C \_\_\_ \$
- rules are written using this notation along with the distinctive features

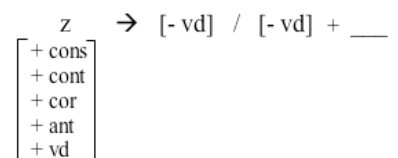
## Feature-changing rules

- feature-changing rules change the values of distinctive features from [+] → [-] or from [-] → [+]
- for example, rule 3 for the plural below changes the value of [voiced]:
- **English Plural:**

1. Add /z/ to the singular of regular count nouns to form the plural
2. Insert [ə] before the plural morpheme when the noun ends in a *sibilant*
3. Change the plural to [s] when a noun ends with a voiceless sound

## English Plural Rule

- that is, the plural [z] becomes [s] when preceded by a voiceless sound
- + in this case indicates a morpheme boundary between the base and the suffix



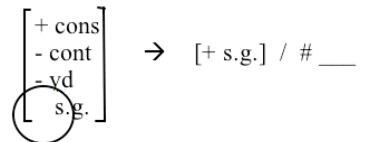
## Dissimilation Rules

- much less common than assimilation rules
- used to make pronunciation easier
- example of the suffix -al/-ar, which makes adjectives

-al	-ar
anecdotal	angular
annual	annular
mental	polar
penal	perpendicular
spiritual	similar
floral	velar

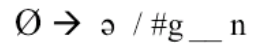
## Feature Adding or Filling

- specifies a value for a previously unspecified feature, eg. [s.g.] in English
- assumes that some feature values are not specified:
- English aspiration is determined by position and requires syllable structure before deciding whether or not to apply



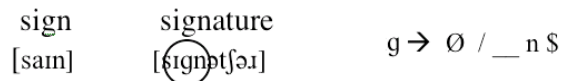
## Insertion (Epenthesis)

- another common process is the adding of a new segment (insertion or epenthesis)
- an example of the adding of a new segment is the insertion of the vowel [ə] in some speaker's pronunciation of the word *gnu*, i.e. [gənu]



## Deletion (Syncope)

- parallel to insertion is the removal of an existing segment (deletion or syncope)
- an example of the deletion of a segment is the difference in pronunciation between *sign* and *signature*

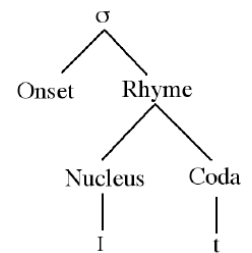
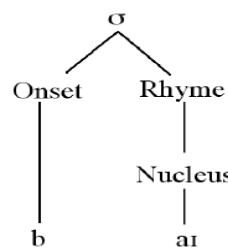
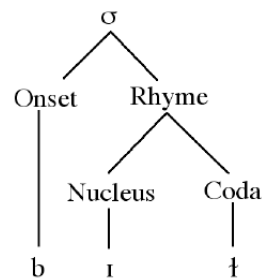


## Syllable Structure

- all languages possess syllable structure and are very much alike in the general format of the syllable
- the syllable is a very useful tool in phonology, allowing the characterization of a number of properties
- provides a structure for the description of processes such as phonotactic constraints, syllable weight, stress assignment, etc.

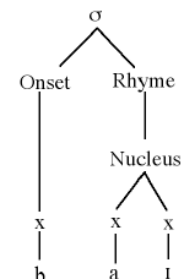
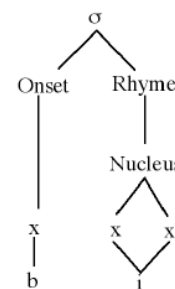
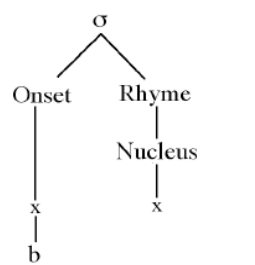
## Constituency

- onset vs rhyme: rhymes rhyme (fat, cat, bat, hat, rat), onsets alliterate ("Too Much Talent in Tennessee?")
- *rhyming* occurs at the end of the word, *alliteration* at the beginning
- stress placement is sensitive to rhymes, doesn't care about onsets
- the first division inside the syllable is between onset and rhyme
- Greek σ represents 'syllable'
- rhymes may be divided into **nucleus** and **coda**
- nucleus is the core of every syllable, without it, there is no syllable (obligatory)
- the onset appears at the beginning of the syllable
- a syllable with an occupied ('filled') coda is 'closed'
- note that the /l/ will be dark-l, [ɫ], if it is in the **rhyme**
- a syllable without a coda is 'open'
- a syllable without an onset consonant may be said to have an 'empty onset'
- it is still a 'closed' syllable



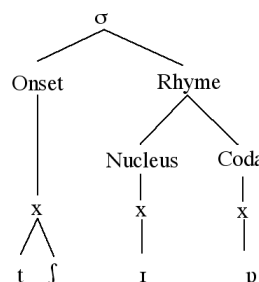
## The Nucleus

- short vowels have a non-branching nucleus
- long vowels/diphthongs represented by branching nucleus
- long vowels attach a single vowel to two slots
- diphthongs attach one vowel to each slot



## Affricates

- affricates can also involve branching
- an affricate branches under one timing slot, so it acts like a single consonant

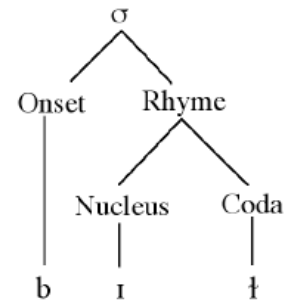
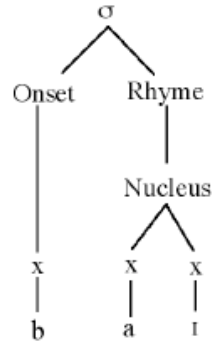
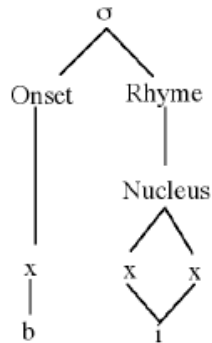
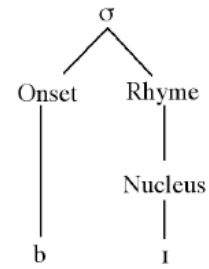


## Syllable Weight

- syllables may be described as light or heavy
- light syllables have no branching anywhere in the Rhyme

## Heavy Syllables

- heavy syllables branch somewhere in the Rhyme
  - in the nucleus: a. long vowel; b. diphthong
  - in the rhyme



## Minimal Words

- the difference between light and heavy syllables is important
- in English, it is involved in stress assignment
- it also helps determine acceptable words:
  - /bɪ/ is not an acceptable word of English (too light)