

Lecture Note on LTS

Lesson 1 Phonetics

- Greek word root "phon" means "sound"
- Phonetics is the science of speech sounds
- Phonetics aims to describe the physical aspects of the sound and studies the perception and production of the sound
- Sound has three defining characteristics:
 - pitch: how high or low a sound is, it's based on the ear's response to the frequency of the sound
 - loudness: the sound energy transferred in a specified direction, it's determined by the intensity of the sound and the sensitivity of the ear
 - quality: the nature of the sound, it allows the ear to distinguish sounds which have the same pitch and loudness
- Spectrogram: a graph to represent the frequencies of speech over time
- From the perspective of sound being pronounced, there are two defining characteristics: place and manner

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2015)

CONSONANTS (PULMONIC)

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	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

- ■ the horizontal row represents the place of articulation
- the vertical row represents the manner of articulation

Lesson 2 Phonology

- Phonology studies the distributional properties of the sounds
- The languages in the world sound so different because the way the languages use speech sounds to form patterns differ from each other
- Phonology tells us what sounds are in the language, how they do and can combine into words, and explains why certain phonetics features are more important to identify a word

- The English noun plural -s's pronunciation is depended on which letter it's attached to
 - voicing: sounds with vocal cord vibration are voiced, and sounds without vocal cord vibration are voiceless
 - sibilance: fricative consonants of higher amplitude and pitch, made by directing a stream of air with the tongue towards the teeth
 - [z] occurs after voiced nonsibilant segments
 - [s] occurs after voiceless nonsibilant segments
 - [əz] occurs after sibilant segments
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	<i>bus</i> + pl.	<i>butt</i> + pl.	<i>bug</i> + pl.
<i>Basic representation</i>	/bʌs + z/	/bʌt + z/	/bʌg + z/
Apply rule (1)	↓ ə	NA* ↓	NA
Apply rule (2)	NA	s	NA
<i>Phonetic representation</i>	[bʌsəz]	[bʌts]	[bʌgz]

- – 1. Insert a [ə] before the plural morpheme /z/ when a regular noun ends in a sibilant, giving [əz]
- – 2. Change the plural morpheme /z/ to a voiceless [s] when preceded by a voiceless sound



- Phonemes are the basic units of sound and are sensed in human's mind rather than be spoken or heard
- Each phoneme have one or more sounds called allophones associate with it, which represent the actual sound being produced in various environment, though they are pronounced differently, they are the same sound
- Allphones of phoneme are in complementary distribution, that is they never occur in the same environment
- Phonology is concerned with the distributional properties of speech sounds, it studies how speech sounds form patterns in a language and across language

Lesson 3 Morphology

- Morpheus: the God of dreams, hence the Greek word root "morph" is associated with "shape and form"
- Morphology: studies of the form of words
- Morphemes — the morphological unit of language, they are the building block that shape the words

- e.g. unhappiness: un-: prefix, happi: stem, -ness: suffix
- happi: free morpheme (can stand on its own)
- un, ness: bound morpheme (have to attach to a free morpheme)
- e.g. morphology: morph: stem & free morpheme, -logy: suffix & bound morpheme, o: linking element(interfix)
- Like phoneme, morphemes are basic units that are sensed in human's mind rather than spoken or heard
- The actual spoken forms of morphemes are called morphs, most morphemes are realized by one morph, but still there are some morphemes are realized more than one morph in relation to their phonological context
- The morphs that represent the same morpheme are called allomorphs, allo itself is a morpheme which stands for "other and different"
- A word is not the simple sequence of morphemes, that has an underlining hierarchical structure
- Morphology studies the internal structure of words and rules by which words are formed

Lesson 4 Semantics

- Semantics: science of meaning in language, can be separated into two parts
 - meaning of words: lexical semantics
 - meaning of sentences: phrasal semantics
- Words are related to one another in a variety of way: synonym, antonym, hyponym, metonym...
 - synonym: words that have close meanings
 - antonym: words have opposite meanings
 - hyponym: words belonging to the same class
 - metonym: words used to replace another word (but convey the same meaning) under certain environment
- Phrasal semantics depend on the meanings of the word and how the words are combined structurally
 - e.g. The boy found a red brick.
 - having an NP structure
 - The boy: agent, doer
 - a red brick: theme
 - e.g. The boy put the red brick on the wall.
 - the red brick: theme
 - on the wall: goal
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Thematic role	Description	Example
Agent	The one who performs an action	Jerry ran.
Theme	The one or thing that undergoes an action	Tom called Jerry .
Goal	The place to which an action is directed	Put the cat on the couch .
location	The place where an action takes place	It rains in Shanghai .
experiencer	One who perceives something	Tom heard Jerry playing the piano.
...		

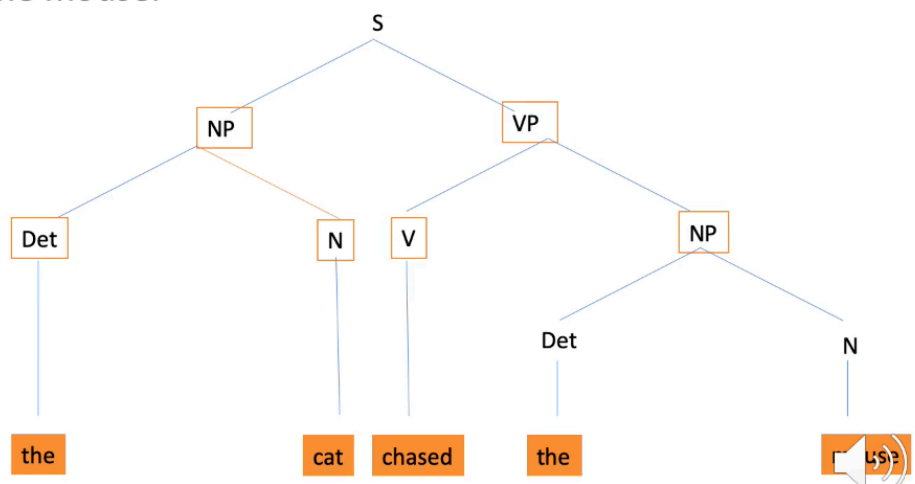
- Semantics is the scientific study of meaning in language

Lesson 5 Syntax

- In English words, "sym-" is related to "same" or "together"
 - synergy: work well together
 - synchronize: content matches with each other
 - syntax: the way in which the words are put together, study of sentence patterns of language
- Syntactical roles determine the order of words and how the words are grouped
- Syntactical category
 - part of speech (e.g. noun, verb, adjective, adverb, pronoun, preposition, ...)
 - phrase structure (e.g. NP, VP, AdjP, AdvP, PP, ...)
 - sentence (as the core of the structure)
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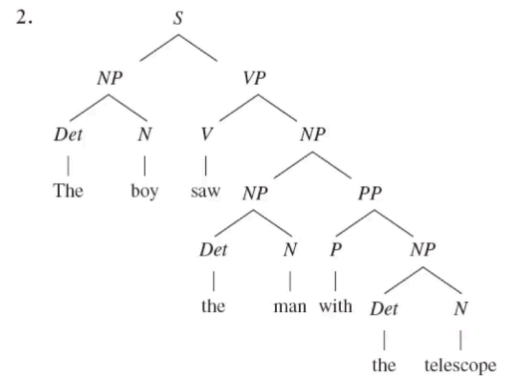
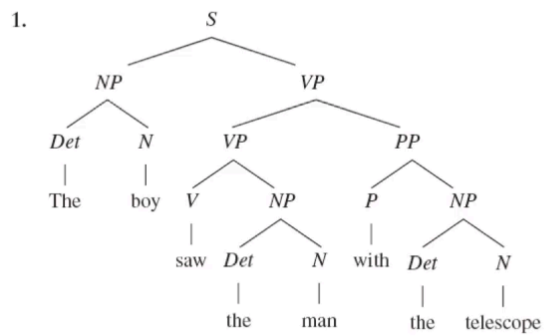
Phrase Structure Tree

- The cat chased the mouse.



- there might be differences in analysing the phrase structure tree:

• **The boy saw the man with the telescope.**



- Phrase structure rules

- S is usually divided into NP and VP
- $NP \rightarrow (Det) + N$
- $VP \rightarrow V + (NP) + (PP)$
- $PP \rightarrow P + NP$

- Syntax studies the rules that govern the ways words combine to form phrases and sentences