

# Language and Cognition

ELL 788

2/11

# Language

- What do we mean when we talk about Language ?
- Learning new languages?
- Often, people talk about the unusual aspects of language use:
  - ▶ word origins (etymology)
  - ▶ Folklorisms like 'Eskimo words for snow'
  - ▶ new or invented languages
- The study of language often involves finding the 'weird' in the normal

## We are effortless language users

- We produce (and understand) hundreds of utterances every day, all of which are meaningful
- Language in human beings is used to share complex knowledge across individuals, co-ordinate joint activities

### Generativity

use fixed number of strings to generate a very large, potentially infinite number of sentences

This is generally understood as an adaptation characteristic of humans

# Non-human communication systems

- We distinguish language from communication or other communicative systems found in other species
- Communication systems in other animals show an ability to learn and produce sequences e.g. birds (zebra finches), apes (Washoe, Kanzi, Nim Chimpsky)
- Mechanisms of acquisition and developmental trajectory and means of use are quite different from humans
- The origin of language: *the* big debate (that no one enjoys)

# Non-human communication systems

- Critical evidence to discriminate between language origin theories is lost in time
- Continuity and discontinuity: Two hypotheses that describe the evolutionary emergence of language
  - ▶ Continuity: Adaptation and natural selection (ideas from Darwinian evolution) apply to the emergence of language
  - ▶ Discontinuity: Language is a relatively small 'jump' from pre-existing communicative abilities

# Non-human communication systems

- Discontinuity: Human language ability represents a clear break from evolutionary past
- Discontinuity: Language is qualitatively different from communication systems in other animals

## Famous proponents of each view

Noam Chomsky: language 'organ' as a sporadic mutation in humans

Phillip Lieberman: speech and motor control are a result of longer, evolutionary processes

- Two abilities with respect to observable physical features include:
  - ▶ physical configuration of the vocal tract
  - ▶ refined motor control over articulators
- Continuity: rudimentary speech abilities must've existed to produce complex vowel sounds (gradual upgradation)
- Discontinuity: only *Homo sapiens* had the nerve tracts associated with complex breathing control (required for speech)

## What does it mean to know a language?

- Language is a cognitive ability
- Parallels with other abilities, such as vision
- Language as an adaptation, with advantages (complex knowledge) and disadvantages (lowered larynx)



The little star's beside a big star

ðə lɪdʒl stɑːz bəsaɪd ə bɪg stɑː

## Duality of Patterning

Form discrete meaningful units from discrete, non-meaningful units

## Translate into Hindi

The little star's beside a big star

yah chota taara ek bade taare ke paas hai

### Arbitrariness

Relationship between objects and events in the world. The linguistic symbols used to represent them is arbitrary

## More examples

the little star's beside a big star

\* the little star's beside for a big star

\* little the's beside a star big

### Grammar

Regulates the combination of symbols into messages (Pinker and Jackendoff, 2005)

“A theory of grammar is a theory about the mental representation of linguistic knowledge” (Sag et. al, 2003)

(1) The little star 's beside a big star  
Det Adj Noun Verb Prep Det Adj Noun

## Lexicon

Words and their parts of speech

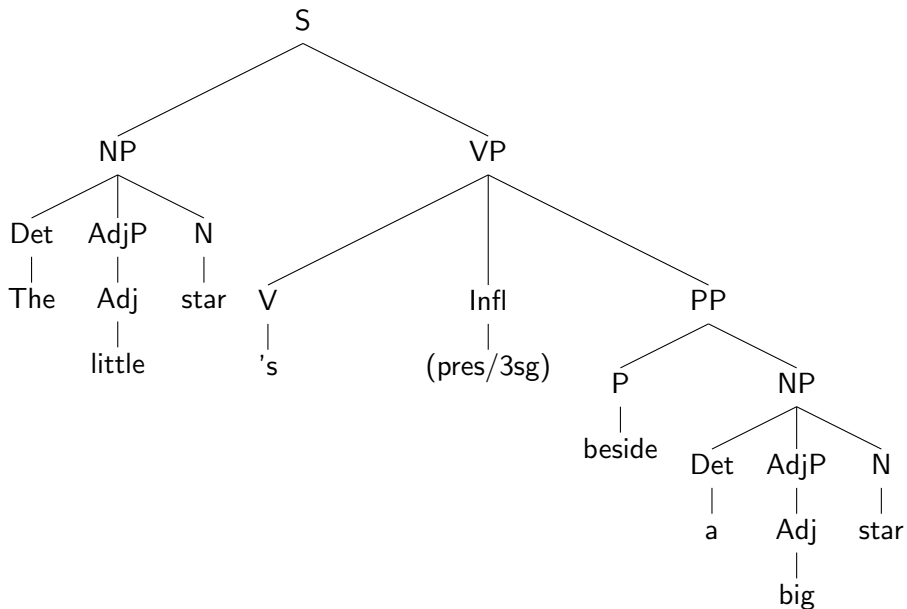
The little stars  
The little cats  
The little buses

## Morphology

The study of words and word formation processes

(2) The little star 's beside a big star  
Det Adj Noun Verb Prep Det Adj Noun

# Syntactic structure



## Levels of linguistic analysis

- Phonetics and Phonology: sounds and sound systems (of a language)
- Morphology (and Morpho-phonology): word formation and the knowledge of words
- Syntax: sentence and phrase formation processes
- Semantics: how sentences are connected with things in the world
- Discourse and Pragmatics: how all levels of language are used to communicate



# Levels of linguistic analysis

- Constructing meaning is the entire reason why we use language
- This process takes place via linguistic expressions (combinatorial processes)
- Understanding this form and meaning pairing is the bread and butter of linguistics

## What makes things meaningful *to* people?

- Perception, background knowledge and communicative context
- Also, other processes like inference interface with linguistic expression

# Cognitive architecture

- Meaning has several interfaces:
  - ▶ linguistic context and prior knowledge
  - ▶ sensory perception
  - ▶ intention and action
- We can think of cognitive structures or 'thought' being acted upon by all these factors
- This brings the study of language a part of the enterprise of cognitive science

# Language and Thought

- What is the connection between language and thought?

## Does thought take place 'in' language ?

“Linguistic form provides one means for thought to be made available to awareness (another is visual imagery)” (Jackendoff, 2002)

- Primate cognition: integration of perception, action, inference and background knowledge (but not language)
- We can connect human cognitive structures or 'thought' with our evolutionary history as well

# Do you think in English or Hindi?

- Translate: aap ne khaana khaaya?

## Language and Thought

Can a language-specific set of meanings be separate from a person's general knowledge and beliefs about the world?

## Spatial location and orientation

- Frames of reference to describe spatial orientation differ in English and Tzeltal Mayan (Levinson 1996, 2003)
- “Pass me the cup on your left” (English) vs. “Pass me the cup which is uphill” (Tzeltal)
- Egocentric axis (left-right) vs. Geocentric axis (north-south)
- This makes Tzeltal Mayan speakers more accurate at geographical locations/directions (and worse at left/right distinctions)
- Does language re-structure our non-linguistic cognition ?

# Linguistic relativity

- Sapir-Whorf hypothesis: differences among languages strongly affect thought processes of their speakers
- Strong version: if a category is not expressed in a language, then the concept for that category does not exist (e.g. honorifics, left/right orientation)
- Weak version: certain concepts may be more easily accessible because these categories exist in the language

# Summary

- Language properties: generativity, arbitrariness, duality of patterning
- Language origin theories: continuity and discontinuity hypotheses
- Language and cognition, language and thought

# References

- Traxler: Introduction to Psycholinguistics: Understanding Language Science, Ch 1, Ch3
- Ray Jackendoff: Foundations of Language, Ch 1 (Example 'The little star's beside the big star' taken from pg6)