
Linguistic Essentials

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Based on Manning&Schutze Ch 3)

Parts of Speech and Morphology

- Parts of Speech correspond to syntactic or grammatical categories such as *noun, verb, adjective, adverb, pronoun, determiner, conjunction, and preposition*.
- Word categories are systematically related by morphological processes such as the formation of plural form from the singular form.
- The major types of morphological processes are inflection, derivation and compounding.

Words' Syntactic Functions

- Typically, nouns refer to entities in the world like people, animals and things.
- Determiners describe the particular reference of a noun and adjectives describe the properties of nouns.
- Verbs are used to describe actions, activities and states.
- Adverbs modify a verb in the same way as adjectives modify nouns. Prepositions are typically small words that express spatial or time relationships. Prepositions can also be used as particles to create phrasal verbs. Conjunctions and complementizers link two words, phrases or clauses.

Nouns

Have features such as:

- number: singular, plural (e.g., *book / books, man / men*)
- gender: masculine, feminine (e.g., *waiter / waitress* – natural gender in English)
 - neutral in some languages (e.g., *das Madchen* in German = *the girl*). Grammatical gender in most languages.
- case: nominative (in subject position), accusative (direct object), genitive (possessive), dative (indirect object)
- (e.g., *filius, filium, filii, filio* in Latin = *the son*)

Proper nouns (names)

Pronouns

Have features such as:

- number, gender, case, person (1st, 2nd, 3rd)

	Nom	Acc	Possesive	Dat	Reflexive
1 st sg	I	me	my	mine	myself
2 nd sg	you	you	your	yours	yourself
3 rd sg masc	he	him	his	his	himself
fem	she	her	her	hers	herself
neutral	it	it	its	its	itself
1 st pl	we	us	our	ours	ourselves
2 nd pl	you	you	your	yours	yourselves
3 rd pl	they	them	their	theirs	themselves

Determiners

- Definite article : *the, that*
- Indefinite article: *a*
- Demonstrative adjectives: *that, those*

Have features like:

- number: singular, plural
- gender: masculine, feminine
- case: nominative, accusative, genitive (possessive), dative

(e.g., *le / la / les* in French)

Adjectives

Have features such as:

- number, gender, case

(e.g., *beau / belle / beaux / belles* in French)

- degree: positive, comparative, superlative

(e.g., *good / better / the best*)

(e.g., *interesting / more interesting / the most interesting*)

Quantifiers (e.g., *all, many, some*)

Verbs

Have features such as:

- number (singular, plural)
- person (1st, 2nd, 3rd) (e.g., 3rd person sg: *the dog **eats***)
- tense (past, present, future) ...
- aspect (progressive, perfect)
(e.g., *eating* – continuous form, gerund)
- base form / infinitive (eat / to eat)
- modality / mood (subjunctive, conditional)
- voice (active / passive)

(e.g., *I ate the cake. / The cake was eaten by me.*)

Adverbs

Have features such as:

- degree: positive, comparative, superlative

(e.g., *fast / faster / the fastest*
well, better, the best)

Qualifiers (e.g., *very fast*)

Prepositions and Particles

- Prepositions
(e.g., *in*, *over*, *on*)
- Particles: in phrasal verbs or other compounds
(e.g., *make up*, *show off*)

Conjunctions

- Coordinating:

(e.g., *apples **and** oranges*)

- Subordinating:

(e.g., *I would like to go the movie, **but** I have to study.*)

- Complementizer: *that*

Introduces a subordinate sentence that is direct object.

(e.g., *I think **that** he will come to class.*)

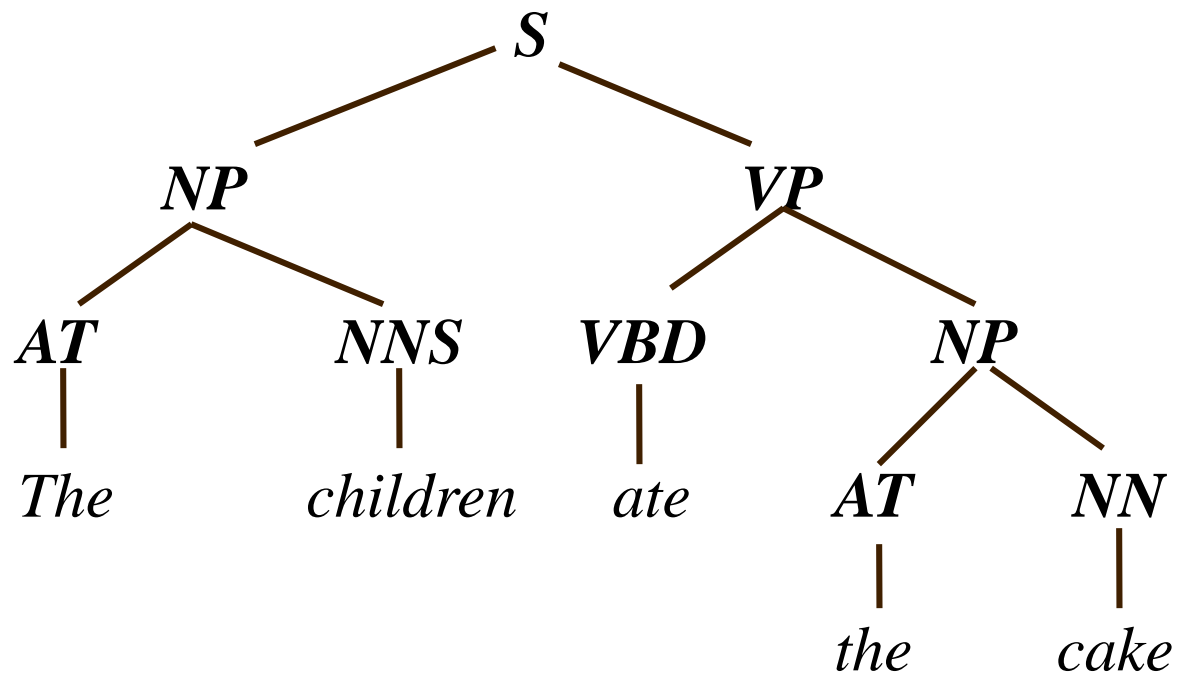
Syntax or Phrase Structure: A simple context-free grammar

- S --> NP VP
- NP --> AT NNS |
AT NN |
NP PP
- VP --> VP PP |
VBD |
VBD NP
- P --> IN NP
- AT --> the
- NNS --> children |
students |
mountains
- VBD --> slept |
ate |
saw
- IN --> in | of
- NN --> cake

The Grammar

The Lexicon

Syntax or Phrase Structure: A Parse Tree



Local and Non-Local Dependencies

- A local dependency is a dependency between two words expressed within the same syntactic rule.
- A non-local dependency is an instance in which two words can be syntactically dependent even though they occur far apart in a sentence (e.g., subject-verb agreement; long-distance dependencies such as wh-extraction).
- Non-local phenomena are a challenge for certain statistical NLP approaches (e.g., n-grams) that model local dependencies.

Semantic Roles

- Most commonly, noun phrases are arguments of verbs. These arguments have *semantic roles*: the *agent* of an action, the *patient* and other roles such as the *instrument* or the *goal*.
- In English, these semantic roles correspond to the notions of *subject* and *object*.
- But things are complicated by the notions of *direct* and *indirect object*, *active* and *passive voice*.

Subcategorization

- Different verbs can relate different numbers of entities: *transitive* versus *intransitive verbs*.
- Tightly related verb arguments are called *complements* but less tightly related ones are called *adjuncts*. Prototypical examples of adjuncts tell us time, place, or manner of the action or state described by the verb.
- Verbs are classified according to the type of complements they permit. This called *subcategorization*. Subcategorizations allow to capture syntactic as well as semantic regularities.

Attachment Ambiguity and Garden-Path Sentences

- Attachment ambiguities occur with phrases that could have been generated by two different nodes in the parse tree.

The child ate the cake with a spoon.

- Genuinely ambiguous: *Fruit flies like a banana.*
- Garden-Path sentences are sentences that lead along a path that suddenly turns out not to work.

The horse raced past the barn fell.

Semantics

- Semantics is the study of the meaning of words, constructions, and utterances.
- Semantics can be divided into two parts: lexical semantics and combination semantics.
- **Lexical semantics**: hypernymy, hyponymy, antonymy, meronymy, holonymy, synonymy, homonymy, polysemy, and homophony.
- **Compositionality**: the meaning of the whole often differs from the meaning of the parts.
- **Idioms** correspond to cases where the compound phrase means something completely different from its parts.

Pragmatics

- Pragmatics is the area of studies that goes beyond the study of the meaning of a sentence and tries to explain what the speaker really is expressing.
- Understand the scope of quantifiers, speech acts, discourse analysis, anaphoric relations.
- The resolution of anaphoric relations is crucial to the task of information extraction.