Basic Parts of Speech

- **Parts of Speech Classes**: adjective, adverb, article, conjunction, noun, verb, preposition, pronoun, etc.

- A **closed class** contains a relatively fixed set of words; new words are rarely introduced into the language.
  
  articles, conjunctions, pronouns, prepositions, etc.

- An **open class** contains a constantly changing set of words; new words are often introduced into the language.
  
  adjectives, adverbs, nouns, verbs

Examples of Closed Classes

- **Articles**: a, an, the
- **Conjunctions**: and, but, or, because, when, if, …
- **Demonstratives**: this, that, these, …
- **Prepositions**: to, for, with, between, at, of, …
- **Pronouns**: I, you, he, she, him, her, myself, …
- **Quantifiers**: some, every, most, any, both, …

Nouns

**Nouns**: represent objects, places, concepts, events.

- *dog, city, idea, marathon*

**Count nouns**: describe specific things or sets of things.

- *dogs, cities, ideas, marathons*

**Mass nouns**: describe composites or substances. Verb agreement is singular. Ex: “Dirt is …”

- *dirt, water, garbage, deer*

Articles

Articles are problematic for *natural language generation*.

Most singular noun phrases begin with an article.

*Ex: a newspaper, an apple, the movie*

But there are many exceptions, for example:

- *The bowl was full of rice.  
  They go to college.*
- *The bowl was full of apple.  
  They go to university.*
- *She went on vacation.  
  She went on trip.*
- *He fell asleep in class.  
  He fell asleep in room.*
- *She sat up in bed.  
  She sat up in chair.*
- *I heard the news on television.  
  I heard the news on radio.*
Modifiers

**Adjectives**: words that attribute qualities to something.

- wet, loud, happy, funny

**Noun modifiers**: nouns that modify other nouns.

- dog food, aluminum can, song book

**Head noun**: typically the rightmost noun of a base (simple) noun phrase; the main concept.

- dog food, smelly beef dog food,
  smelly beef dog food coupon

Prepositions and Particles

**Prepositions** represent relationships, such as time, location, modification, and complements.

- He put the book on the table.
- Sam gave the book to Mary.
- Jane walked up the stairs.

**Particles** follow verbs and create a new verbal meaning.

- Greg passed out.
- Charlie threw up his lunch.

Sometimes there can be preposition/particle ambiguity:

- Sarah looked over the paper.

Verbs

**Verbs**: represent actions, commands, assertions.

Types of verbs:

- **main verbs**: walk, eat, believe, claim, ask, ...
- **auxiliary verbs** (used with a main verb):
  - be, do, have, ...
- **modals**: would, should, could, can, will, may, ...

Verb Forms and Tenses

<table>
<thead>
<tr>
<th>Form</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base (root)</td>
<td>walk, be, go</td>
</tr>
<tr>
<td>Infinitive</td>
<td>to walk, to be, to go</td>
</tr>
<tr>
<td>Simple Present</td>
<td>walks, is, goes</td>
</tr>
<tr>
<td>Present Participle</td>
<td>walking, being, going</td>
</tr>
<tr>
<td>Simple Past</td>
<td>walked, was, went</td>
</tr>
<tr>
<td>Past Participle</td>
<td>walked, been, gone</td>
</tr>
</tbody>
</table>

There are also more complex tenses, for example:

- Future: will + Base Verb
- Present Progressive: is/are + Present Participle
Voice

Passive voice consists of a form of “be” followed by a past participle.

<table>
<thead>
<tr>
<th>Active Voice</th>
<th>Passive Voice</th>
</tr>
</thead>
<tbody>
<tr>
<td>I saw Elvis.</td>
<td>Elvis was seen by me.</td>
</tr>
<tr>
<td>I will find him.</td>
<td>He will be found by me.</td>
</tr>
<tr>
<td>I have found him.</td>
<td>He has been found by me.</td>
</tr>
</tbody>
</table>

**Important:** the roles are reversed in active and passive voice.

John killed Sam.  
Subject is killer.  
Direct Object is victim.

Sam was killed by John.  
Subject is victim.  
Object of “by” PP is killer.

Gerunds (or gerundives)

Gerunds are present participle (-ing) verb forms that syntactically **function as nouns**.

- drinking fountain
- moving sale
- dining room

Skiing is popular in Utah.
Drinking and driving is dangerous.
My singing in the shower bothers my roommate.
Winning races is exciting.
The killing in Bosnia is still going on.

Adverbs and Adverbial Phrases

**Adverbs** qualify the meaning of verbs, adjectives, adverbs, clauses … nearly anything other than a noun!

- She sings well.
- He runs very fast.
- He left a present here yesterday.
- She drove slowly.
- John frequently went to the doctor.
- Mary sings often.
- Then Gary will go back to school.
- The computer crashes almost every day.

Transitivity

Transitive verbs require **syntactic** objects.

- An intransitive verb has no object.  
  she laughed, he lied

- A transitive verb has a **direct object**.  
  she ate an apple, he read a book

- A ditransitive/bitransitive verb has two objects: a **direct object** and an **indirect object**.  
  he gave Mary a gift  
  she sang the baby a song
### Subcategorization Frames

<table>
<thead>
<tr>
<th>Verb</th>
<th>Subcat. Frame(s)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>laugh</td>
<td>--</td>
<td>She laughed.</td>
</tr>
<tr>
<td>find</td>
<td>NP</td>
<td>She found a kitten.</td>
</tr>
<tr>
<td>give</td>
<td>NP NP</td>
<td>She gave the dog a bone.</td>
</tr>
<tr>
<td></td>
<td>NP PP(to)</td>
<td>She gave a bone to the dog.</td>
</tr>
<tr>
<td>reside</td>
<td>PP(in)</td>
<td>She resides in Utah.</td>
</tr>
<tr>
<td>put</td>
<td>NP PP(on)</td>
<td>She put the book on the shelf.</td>
</tr>
<tr>
<td></td>
<td>NP PP(in)</td>
<td>She put the book in a drawer.</td>
</tr>
<tr>
<td>try</td>
<td>VP(to)</td>
<td>She tried to sleep.</td>
</tr>
<tr>
<td></td>
<td>NP</td>
<td>She tried sushi.</td>
</tr>
<tr>
<td>believe</td>
<td>S</td>
<td>She believed that ....</td>
</tr>
</tbody>
</table>

### Sentence Complements

Some verbs accept an entire sentence structure (S) as a complement.

- He believed that the world would end tomorrow.
- She knows that Elvis is still alive.
- He claimed that there was life on Mars.
- They hope their lottery ticket will be a winner.
- Jim does not know why the dinosaurs died.
- She wondered whether it will rain tomorrow.

### Relative Pronouns and Clauses

**Relative Pronouns:** who, which, that, ...
- The man who saw Elvis ...
- The UFO that landed in Toledo ...
- The Rolling Stones concert, which I attended ...

**Relative Clauses:** (relative pronoun may be omitted)
- The man who saw Elvis ...
- The man I saw in Boston was wearing a purple hat.

**Reduced Relative Clauses:** relative pronoun and “be” omitted
- The boy run over by the car was sent to the hospital.
- The doctor arrested for fraud is still practicing medicine.

### Sentence Moods

- **Declarative (assertion)**
  - Elvis is alive.
- **Yes/No question**
  - Is Elvis alive?
- **WH-question**
  - Where is Elvis?
- **Imperative (command)**
  - Forget about Elvis!
Sentence Structure

A **Parse Tree** represents sentence structure.

*The lost boy was quickly found.*

Multiple Parse Trees

*John walked the dog with fleas.*

Attachment Ambiguities

**Prepositional Phrases**
- *The box on the table with the pencils.*
- *The robbery of McDonald’s in Boston by men with guns.*
- *The man on the hill with the telescope.*

**Conjunctions**
- *The antics of Rover, my dog, and Rufus, my cat, ...*
- *The antics of Rover, my dog and Fido ...*
- *The antics of Rover, Rufus, my cat, and Fido ...*
- *Fred, the mayor of the town that was devastated by a tornado, and John, the governor of ...*

Internal Noun Phrase Bracketing

Nouns and modifiers within a noun phrase can be bracketed to disambiguate the intended meaning of the NP.

*red plastic cat food can cover*

*winter computer science department course schedule*