Introduction to Linguistics – LANE 321

CHAPTER 9 – SYNTAX

Syntax

- When we concentrate on the structure & ordering of components within a sentence = studying the syntax of a language
- Syntax (originally Greek) = 'putting together'/ 'arrangement'

Syntax is the study of the rules governing the way words are combined to form phrases and sentences in a language.

Symbols used in syntactic analysis

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S sentence	**NP** noun phrase	**PN** proper noun
N noun	**VP** verb phrase	**Adv** adverb
V verb	**Adj** adjective	**Prep** preposition
Art article	**Pro** pronoun	**PP** prepositional phrase

*   ungrammatical sentence
→   consists of / rewrites as
( )   optional constituent
{ }   one and only one of these constituents must be selected

S → NP VP
NP → {Art (Adj) N, Pro, PN}
VP → V NP (PP) (Adv)
PP → Prep NP

Syntax

○

- When we set out to provide an analysis of the syntax of a language, we try to adhere to the "all and only" criterion.
- This means that our analysis must account for:
  - all the grammatically correct phrases and sentences and
  - only those grammatically correct phrases and sentences in whatever language we are analyzing.
- In other words, if we write rules for the creation of well-formed structures, we have to check that those rules won't also lead to ill-formed structures.

Syntax

- The grammar will generate all the well-formed structures of the language
- The grammar will not generate any ill-formed structures

For example,

 We might say informally that, in English,

- a preposition (e.g. *near*) + a noun (e.g. *London*) = a prepositional phrase (*near London*).
- If we follow this rule, we will produce phrases like *near tree* or *with dog*.
- We clearly need to be more careful in forming this rule.
- a preposition + a noun phrase (not just a noun) = a prepositional phrase.
- NP ⟶ {Art (Adj) N, Pro, PN}
- So that the revised rule can produce these well-formed structures: *near London, with you, near a tree, with the dog*
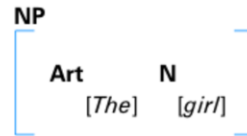
Syntax

- When we have an effective rule such as "a prepositional phrase in English consists of a preposition followed by a noun phrase," we can imagine an extremely large number of English phrases that could be produced using this rule.
- In fact, the potential number is unlimited.
- This reflects another goal of syntactic analysis, which is:
  - to have a small and finite set of rules that will be capable of producing a large and infinite number of well-formed structures.
- This small and finite set of rules is sometimes described as generative grammar because it can be used to "generate" or produce sentence structures and not just describe them.
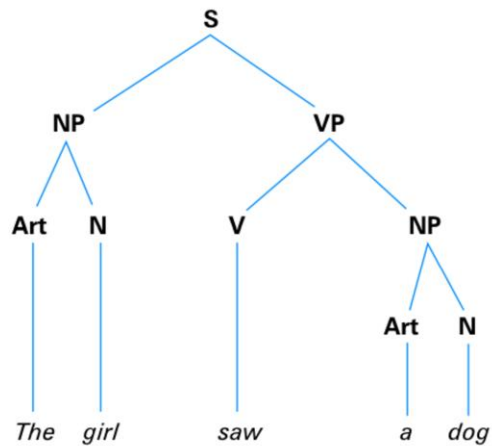
Tree diagrams

- *The girl*
- Labeled & bracketed format

NP
[**Art** **N**]
[*The*] [*girl*]

One of the most common ways to create a visual representation of syntactic structure is through tree diagrams.

NP
Art **N**
The *girl*
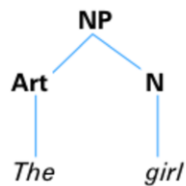
Tree diagrams

- *The girl saw a dog*

S
NP **VP**
Art **N** **V** **NP**
Art **N**
The *girl* *saw* *a* *dog*

11/15/2015

Symbols used in syntactic analysis

S sentence   NP noun phrase   PN proper noun
N noun   VP verb phrase   Adv adverb
V verb   Adj adjective   Prep preposition
Art article   Pro pronoun   PP prepositional phrase

*   ungrammatical sentence
→   consists of / rewrites as
( )   optional constituent
{ }   one and only one of these constituents must be selected

S → NP VP
NP → {Art (Adj) N, Pro, PN}
VP → V NP (PP) (Adv)
PP → Prep NP

Symbols used in syntactic analysis

Three more symbols:

1. ⟶   (= consists of)

For example:

- NP ⟶ Art N
- It is a shorthand way of saying that a noun phrase consists of an article and a noun.

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Symbols used in syntactic description

⭕

2. round brackets ( ) (= an optional constituent)

For example:

- The dog = NP
- The small dog = NP
- When we want to use a NP in English, we can include an (Adj), but we do not have to. It is optional.
- NP ⟶ Art (Adj) N
- It is a shorthand way of saying that a noun phrase consists of an article (Art) and a noun (N), with the option of including an adjective (Adj) in a specific position between them.
- We can use this notation to generate *the dog, the small dog, a cat, a big cat, the book, a boring book*, etc.

Symbols used in syntactic description

⭕

3. curly brackets { } (= only one of the elements

enclosed within the curly brackets must be selected.)

For example:

- NP ⟶ Art N   (e.g. *the dog*)
- NP ⟶ Pro   (e.g. *it*)
- NP ⟶ PN   (e.g. *Abeer*)

$$NP \rightarrow Art\ N$$
$$NP \rightarrow Pro$$
$$NP \rightarrow PN$$

$$NP \rightarrow \begin{Bmatrix} Art\ N \\ Pro \\ PN \end{Bmatrix}$$

$$NP \rightarrow \{Art\ N,\ Pro,\ PN\}$$

Phrase structure rules

We can think of the tree diagram format in 2 different ways.

1. **As a** static representation of the structure of the sentence shown at the bottom of the diagram.

2. **As a** dynamic format – represents a way of generating a very large number of other sentences with similar structures.

Phrase structure rules

- This second approach would enable us to generate a very large number of sentences with a very small number of rules.
- These rules are called phrase structure rules.
- Phrase structure rules state that the structure of a phrase of a specific type will consist of one or more constituents in a particular order.
- We can use phrase structure rules to present the information of the tree diagram in another format.

NP

Art   N

Tree diagram   NP → Art   N

Phrase structure rule

Phrase structure rules

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- The first rule in the following set of simple phrase structure rules states that "a sentence rewrites as a noun phrase and a verb phrase."

- The second rule states that "a noun phrase rewrites as either an article plus an optional adjective plus a noun, or a pronoun, or a proper noun"

$$S \rightarrow NP \; VP$$
$$NP \rightarrow \{Art \; (Adj) \; N, \; Pro, \; PN\}$$
$$VP \rightarrow V \; NP \; (PP) \; (Adv)$$
$$PP \rightarrow Prep \; NP$$

Lexical rules

○

- Phrase structure rules generate structures.

- In order to turn this structure into recognizable English, we also need lexical rules.

PN ⟶ {Mary, George}	V ⟶ {followed, helped, saw}
N ⟶ {girl, dog, boy}	Adj ⟶ {small, crazy}
Art ⟶ {a, an, the}	Prep ⟶ {near, with}
Pro ⟶ {it, you}	Adv ⟶ {recently, yesterday, slowly}

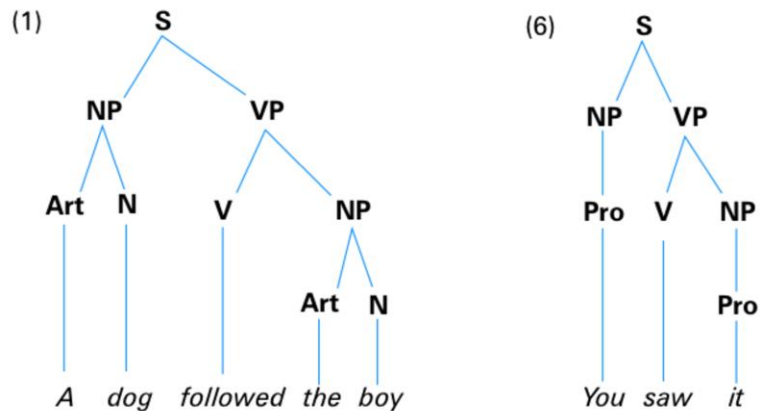# Lexical rules

- We can rely on these rules to generate the grammatical sentences 1-6, but not the ungrammatical sentences 7-12.

(1) *A dog followed the boy.*   (7) **Dog followed boy.*
(2) *Mary helped George.*   (8) **The helped you boy.*
(3) *George saw the dog.*   (9) **George Mary dog.*
(4) *The boy helped you.*   (10) **Helped George the dog.*
(5) *It followed Mary.*   (11) **You it saw.*
(6) *You saw it.*   (12) **Mary George helped.*

Lexical rules

Movement rules

- Declarative forms (*You will help Mary*)

- Interrogative forms (*Will you help Mary?*)

- In making the question, we move one part of the structure to a different position.

- This process is based on a movement rule.

S → NP Aux VP
Aux → {*can, could, should, will, would*}
V → {*follow, help, see*}

Movement rules

With these components, we can specify a simple movement rule that is involved in the creation of one basic type of question in English.

NP Aux VP ⇒ Aux NP VP

Movement rules

O

This type of rule has a special symbol ⇒ and can be illustrated in the

process of one tree, on the right, being derived from the tree on the left.

Movement rules

O
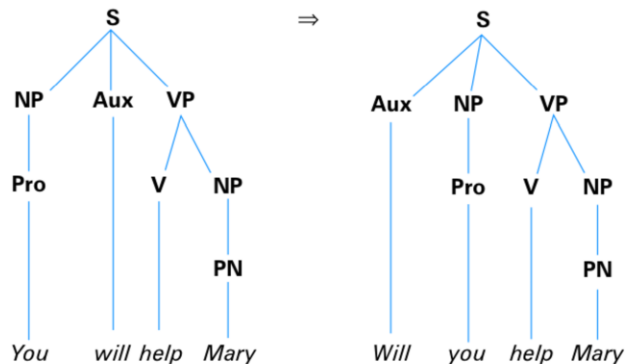
Using this simple rule, we can also generate these other

questions:

Can you see the dog?   *Should George follow you?*
Could the boy see it?   *Would Mary help George?*

Deep and surface structure

This type of grammar should also be capable of revealing the basis of two other phenomena:

1. how some superficially different sentences are closely related

2. how some superficially similar sentences are in fact different.

Deep and surface structure

- *Charlie broke the window.*
- *The window was broken by Charlie.*
- *Charlie was the one who broke the window.*
- *It was Charlie who broke the window.*
- *Was the window broken by Charlie?*

- Different in their *surface structure* = different arrangement or ordering
- BUT they have the same 'deep' or underlying structure = same basic components (NP + V + NP)
- The deep structure is an abstract level of structural organization in which all the elements determining structural interpretation are represented.
- In short, the grammar must be capable of showing how a single underlying abstract representation can become different surface structures.

Structural ambiguity

- *Annie whacked the man with an umbrella.*
  - Same surface structure
  - BUT different deep structure
  - What are the two possible meanings/ the two distinct deep structures/ two distinct underlying interpretations here?
- *The boy saw the man with the telescope.*
- *Small boys and girls*
- *Our syntactic analysis should be capable of showing the structural distinction between these underlying representations.*

Structural ambiguity: *a situation in which a single phrase or sentence has two (or more) different underlying structures and interpretations.*

Structural ambiguity

The boy saw the man with the telescope.

Meaning 1: Using the telescope, the boy saw the man

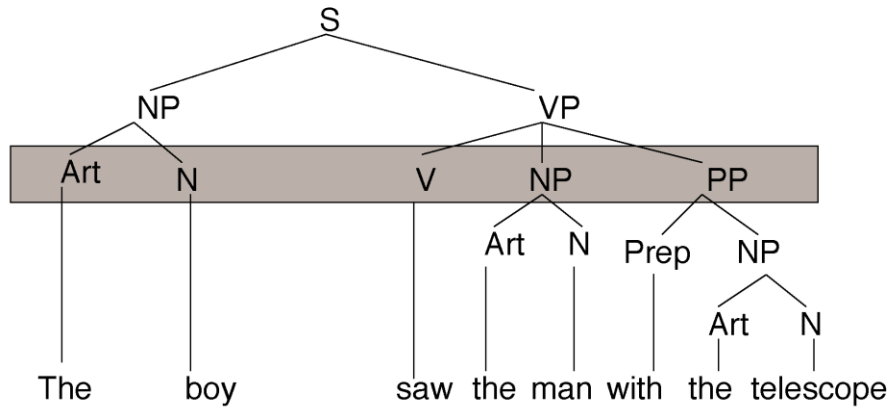**Meaning 2:** The boy saw the man. The man had a telescope.

$S \rightarrow NP\ VP$
$NP \rightarrow \{Art\ (Adj)\ N,\ Pro,\ PN\}$
$VP \rightarrow V\ NP\ (PP)\ (Adv)$
$PP \rightarrow Prep\ NP$
New rule: $NP \longrightarrow Art\ (Adj)\ N\ (PP)$
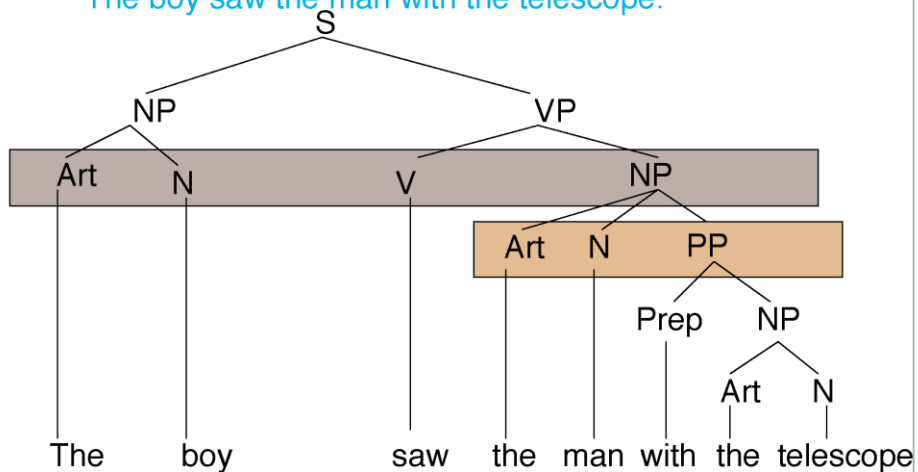
Structural ambiguity

The boy saw the man with the telescope.

Meaning: Using the telescope, the boy saw the man

Structural ambiguity

The boy saw the man with the telescope.

Meaning: The boy saw the man. The man had a telescope.

Recursion

- Recursive Rules can be applied more than once in generating a structure.
- e.g.
  - repeat prepositional phrase more than once
  - *The gun was on the table.*
  - *The gun was on the table near the window.*
  - *The gun was on the table near the window in the bedroom.*
  - Put sentences inside other sentences
  - *Mary helped George*
  - *Cathy knew that Mary helped George.*
  - *John believed that Cathy knew that Mary helped George.*
  - *This is the cat that ate the rat that ate the cheese that was sold by the man that lived in the city that was on the river…*

Recursion

- No end to recursion that would produce longer complex sentences.
- Our syntactic analysis should account for the fact that a sentence can have another sentence inside it or that a phrase can be repeated as often as required.

Mary helped George.
Cathy knew that Mary helped George.
John believed that Cathy knew that Mary helped George.

Complement phrases

- *Cathy knew that Mary helped George*
- *that* = complementizer (C) =
- The role of *that* as a complementizer is to introduce a complement phrase (CP)
- *that Mary helped George* = CP
- New rule:

CP ⟶ C S

  "A complement phrase consists of a complementizer and a sentence."
- From the example, the CP comes after a V
- This means that we are using the CP as part of a VP (*knew that Mary helped George*).
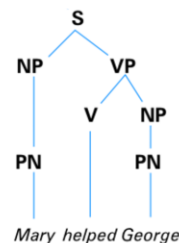- Now, we have a new rule, "A verb phrase consists of a verb and a complement phrase."

or, VP ⟶ V CP

Complement phrases
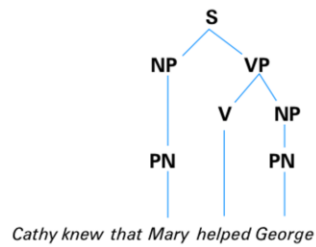
$S \rightarrow NP\ VP$
$VP \rightarrow V\ CP$
$CP \rightarrow C\ S$
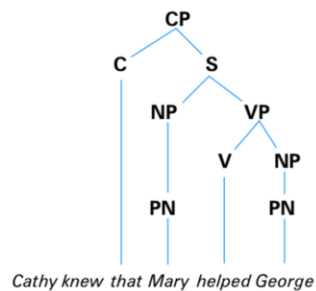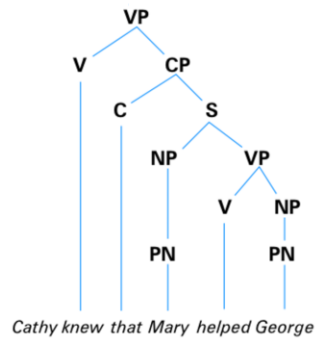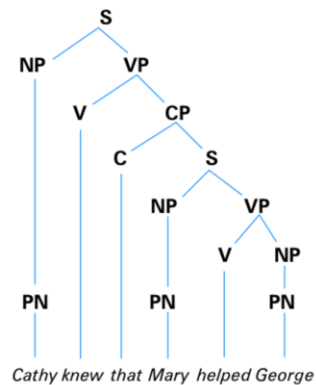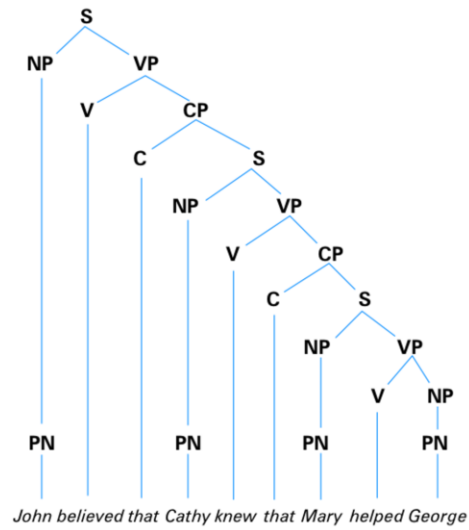
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Complement phrases

$S \rightarrow NP\ VP$
$VP \rightarrow V\ CP$
$CP \rightarrow C\ S$


```
                S
            NP     VP
                 V    NP
            PN         PN

   Cathy knew that Mary helped George
```

Complement phrases

$S \rightarrow NP\ VP$
$VP \rightarrow V\ CP$
$CP \rightarrow C\ S$


```
                  CP
              C       S
                  NP     VP
                       V    NP
                  PN         PN

   Cathy knew that Mary helped George
```

Complement phrases

$$S \rightarrow NP\ VP$$
$$VP \rightarrow V\ CP$$
$$CP \rightarrow C\ S$$

Cathy knew that Mary helped George

Complement phrases

$$S \rightarrow NP\ VP$$
$$VP \rightarrow V\ CP$$
$$CP \rightarrow C\ S$$

Cathy knew that Mary helped George

Complement phrases

$S \rightarrow NP\ VP$

$VP \rightarrow V\ CP$

$CP \rightarrow C\ S$

John believed that Cathy knew that Mary helped George

Exercises

- Try this:
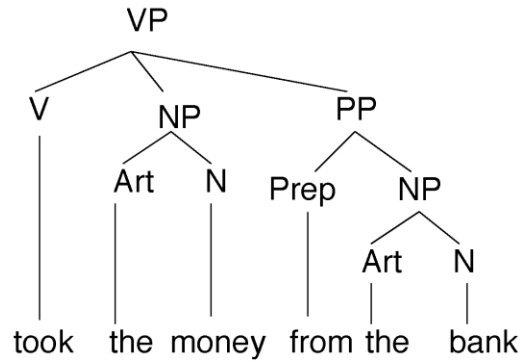 - Ahmed thinks that the teacher knows that Muhammad met Hani.
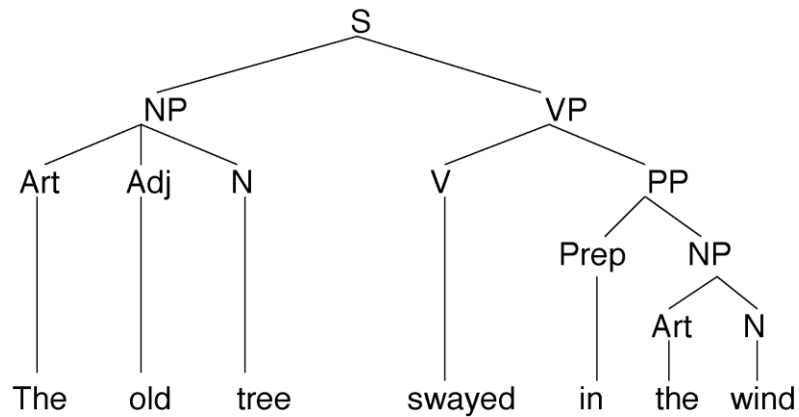
Exercises
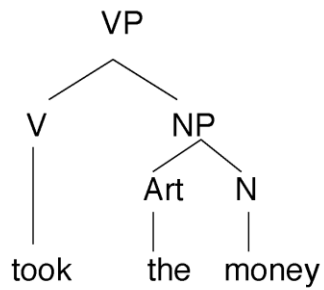
took the money · took the money from the bank
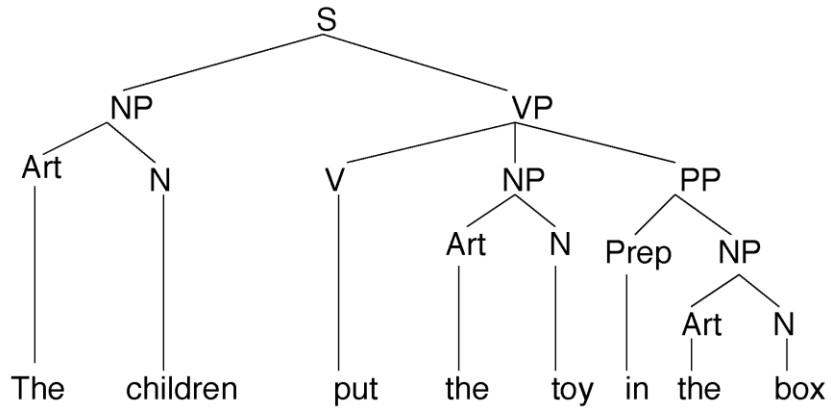

Exercises

The old tree swayed in the wind.
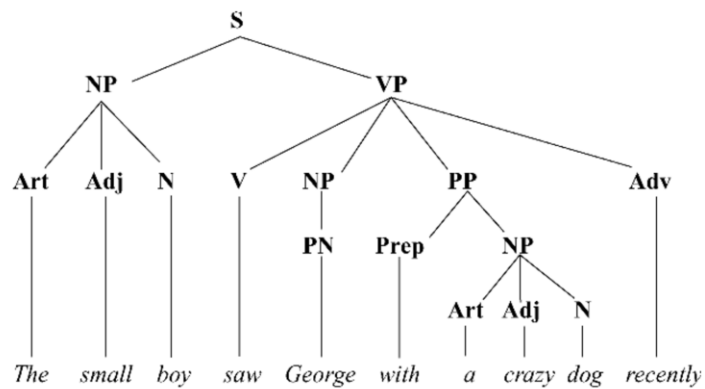
Exercises

The children put the toy in the box.

Exercises

The small boy saw George with a crazy dog recently.

Exercises

○

- Try this:

  - Sarah went to the hospital.

  - He saw John with an amazing car yesterday.

  - I met her yesterday.

Exercises

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- Form the phrase structure rules of the following sentences.

  - Can John see it?

  - Should Mary follow the small boy?

- Draw a tree diagram to represent each of the above sentences.

Exercises

○

- Draw a tree diagram to represent the different syntactic components of the following sentences.

  - The guy met the researcher.
  - The smart guy met the researcher.
  - The smart guy met the famous researcher.

- Now, create a labeled & bracketed analysis of the above sentences.

Exercises

○

Draw two phrase structure trees representing the two meanings of the sentence:

The magician touched the child with the wand.

References

- Yule, George. *The study of language*. Cambridge University Press, 2014.
- Alroqi, Haifa. LANE 321 Introduction to linguistics lecture notes. King Abdulaziz University, 2015.

Thank you