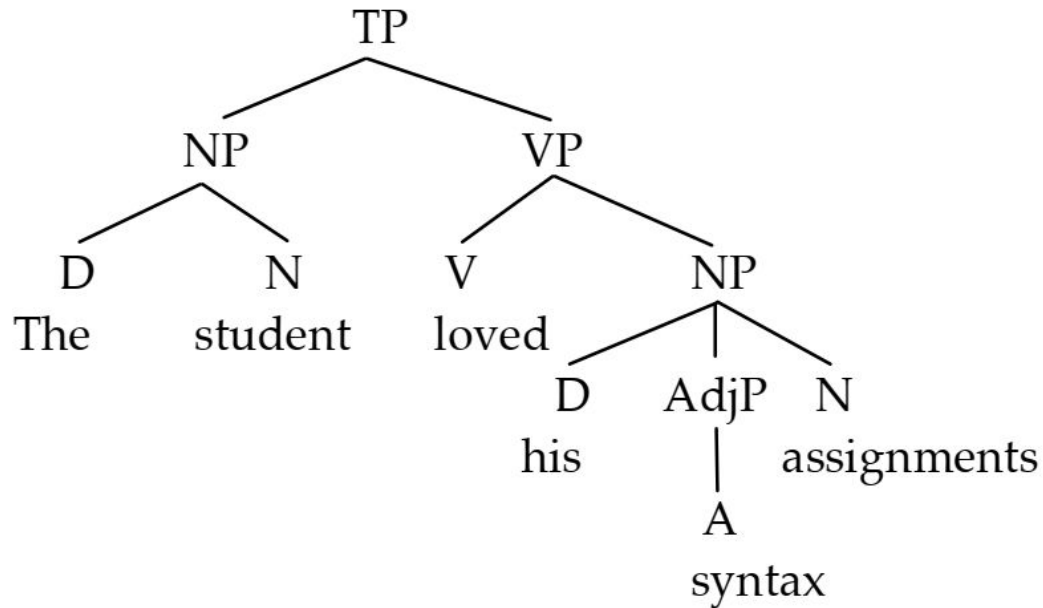


# Constituency, Trees, and Rules

---

# Syntactic trees

---



# Internal Structure & Constituents

---

1) The Mayor of Helsa eats butterflies for breakfast

How do we represent (1)?

2) [ Mayor, the, eats, of, Helsa, butterflies, breakfast, for]

We are not constructing sentences by simply stringing words together like beads on a necklace!

Representation (2) doesn't tell us anything about the internal structure of (1).

# Syntactic trees

---

3. I see the man with binoculars

**Reading 1:** I see [the man with binoculars]

**Reading 2:** I see [the man] with binoculars

Syntactic trees allow us to differentiate between the two readings of sentences like (3).

# Internal Structure & Constituents

---

- Words are grouped into units called “constituents”
- “Constituents” are groups of words that functions together as a unit.
- Constituents are grouped together to form a sentence

Which sets of words intuitively seem to belong together?

1) The Mayor of Helsa eats butterflies for breakfast

1.

# Constituency

Let's start with  
the first set of  
slides

# Constituency tests

---

How do we find out whether certain groups of words form a constituent (i.e. they “belong together”)?

We use something called **constituency tests**.

There are **various types** of constituency tests:

- ▣ Substitution
- ▣ Movement
- ▣ Coordination

# The Substitution Test

---

If something forms a constituent, it can be replaced by elements such as “they, it, do so, there”.

4. The children will stop at the corner if they see us do so.
  - **They** will stop at the corner if they see us do so  
[**The children**] forms a constituent.
  - They will stop **there** if they see us do so  
[**At the corner**] forms a constituent.
  - The children will stop at the corner if they see us **do so**  
[**stop at the corner**] forms a constituent.



# The Substitution Test

---

4. The children will stop at the corner if they see us do so.

[**The children will**] doesn't form a constituent.

[**At the**] doesn't form a constituent.

[**The will stop**] doesn't form a constituent.

# The Coordination Test

---

If something forms a constituent, it can be joined to another group of words by a conjunction such as “and, or, but”.

5. The children stopped at the corner.
  - The children [stopped at the corner] but [didn't look both ways]  
[**stopped at the corner**] forms a constituent.
  - The children stopped [at the corner] and [at the bus stop].  
[**At the corner**] forms a constituent.  
[**the corner**] forms a constituent.

# The Coordination Test

---

- \*The children stopped [at the] corner and [at the] **[at the]** does not form a constituent.

# The Movement Test

---

If something forms a constituent, it can be moved as a single unit to a different position in the sentence.

5. The children stopped at the corner.
- [At the corner], the children stopped  
[**at the corner**] forms a constituent.

# Summing up

---

Groups of words that form a unit are called “**constituents**”.

To determine whether something forms a constituent we use **constituency tests**.

We have seen three types of constituency tests:

- ▣ **Substitution**

replace with “it, they, she/he, this, there, do so”

- ▣ **Movement**

move the constituent, e.g. to the front of the clause

- ▣ **Coordination**

Use “and, or, but” to join to another group of words

# Exercise

---

Identify the constituents in the following sentences:

6. The owner of the shop turned off the light.
7. Sam and Patricia decided to cook pasta at the hotel.

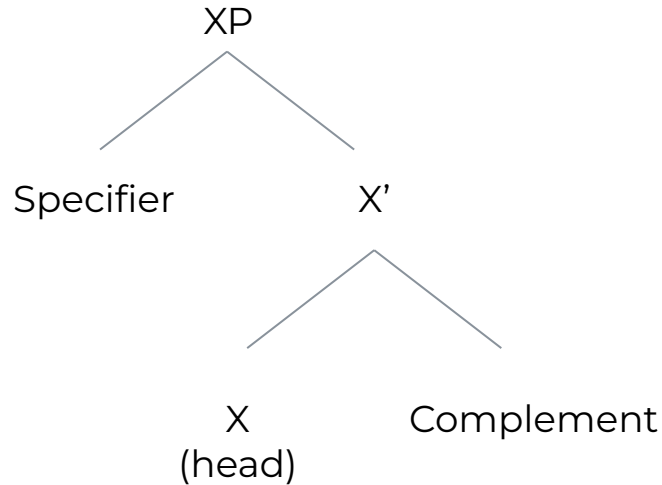
# 2.

## Phrase Structure

Let's start with  
the first set of  
slides

# The Blueprint

---

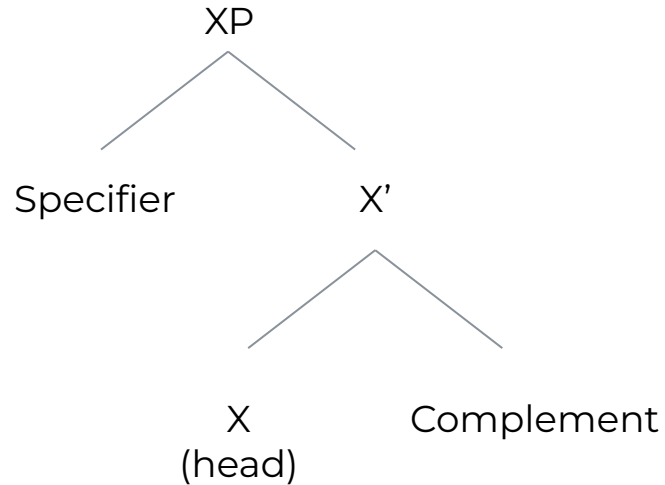


- This is the blueprint of a **phrase**.
- It is a **three-level** structure. The levels are X, X' (read: X “bar”) and XP.
- ALL phrases minimally contain a **head, X**.
- If there’s a **complement**, it is attached at the intermediate X' level, as the “sister” of X.
- If there is a **specifier**, it is attached at the XP level.
- This blueprint is called the X' schema.



# The Blueprint

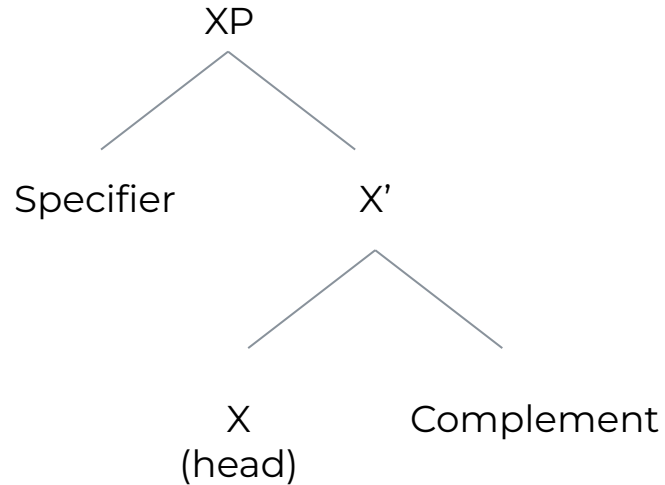
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- These structures are also called (inverted) **trees**.
- The lines are called “**branches**”

# The Blueprint

---



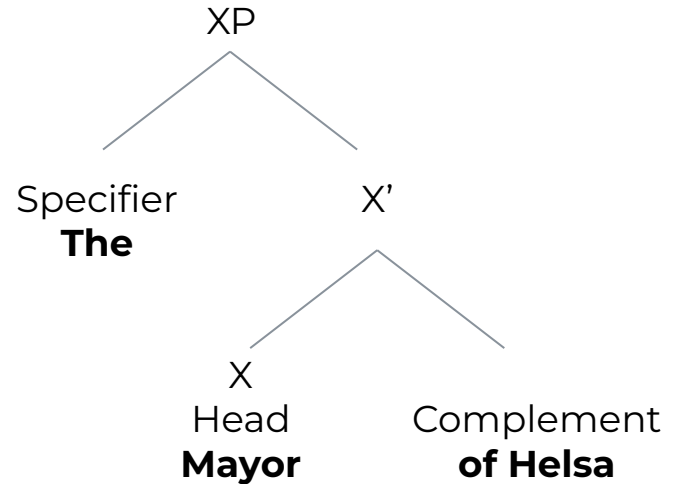
- These structures are also called (inverted) **trees**.
- The lines are called “**branches**”

# The Blueprint

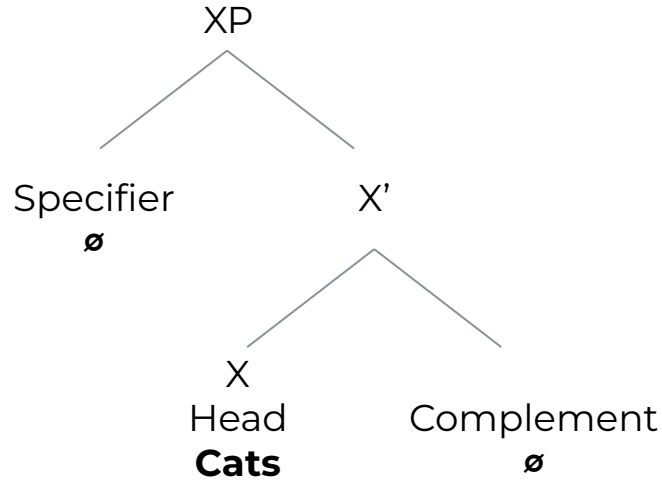
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Tree representation of the constituent “the Mayor of Helsa”.

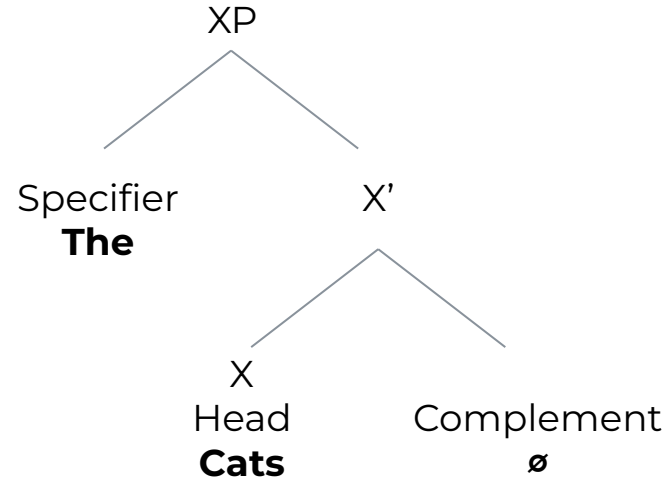
**The Mayor of Helsa** eats butterflies.



# The Blueprint



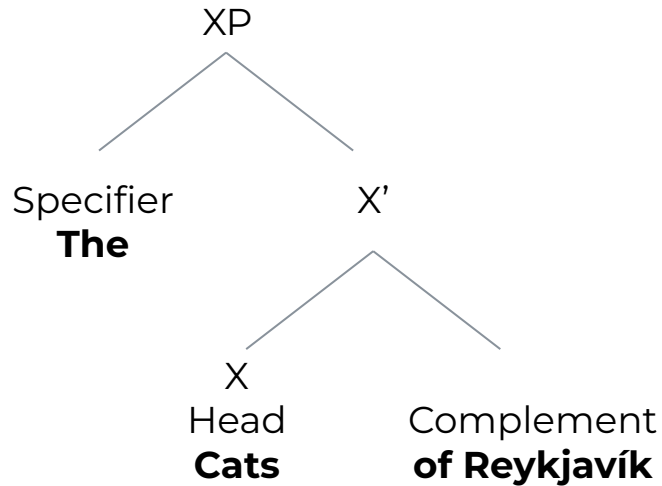
[Cats] like fish



[The cats] like fish

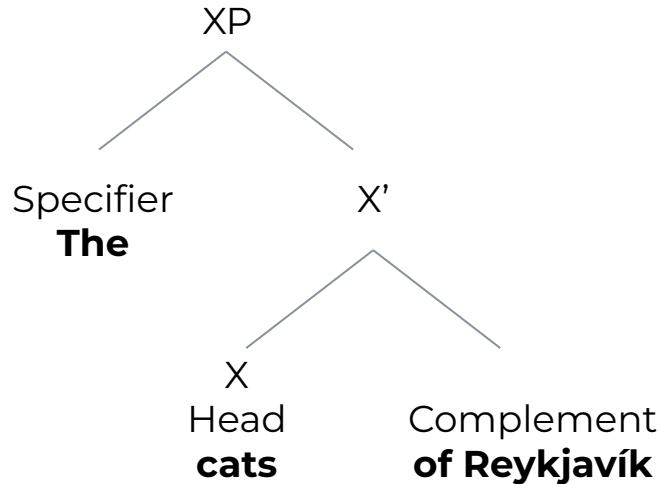
# The Blueprint

---



[The cats of Reykjavík] like fish

# The Blueprint



[The cats of Reykjavík] like fish

- There are **three possible levels**.  
The levels are X, X' and XP.
- ALL phrases minimally contain a **head, X**.
- Some phrases will also have a **complement**.  
The complement is attached at the X' level.
- Some phrases will also have a **specifier**.  
The specifier is attached at the XP level.

# 2.

## Heads

Let's start with  
the first set of  
slides

# Heads

---

The head is the **obligatory** nucleus around which a phrase is built.

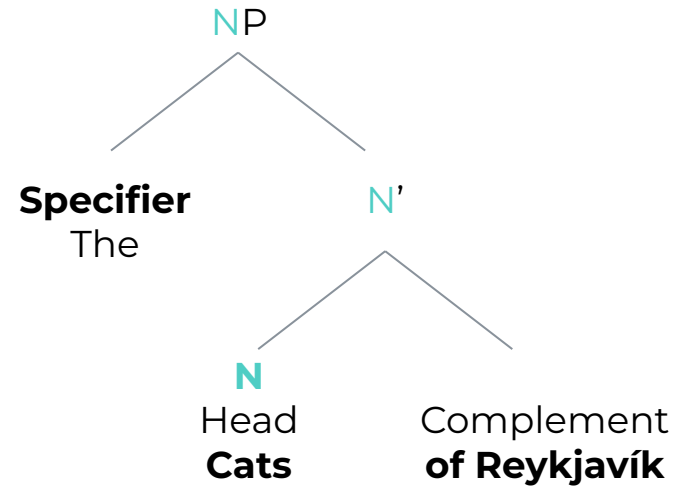
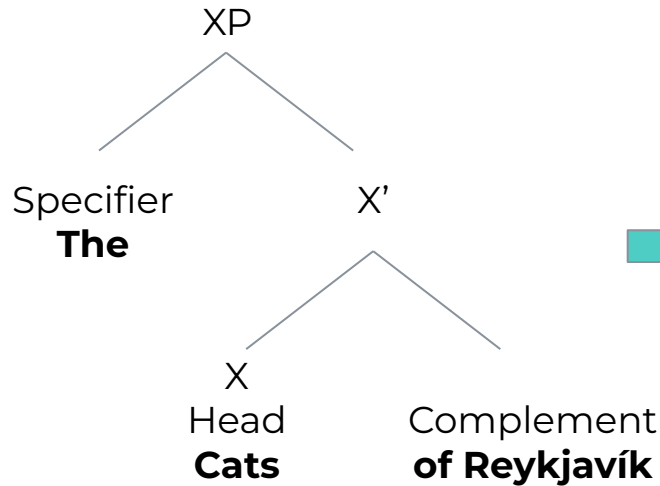
The head **defines the type** of syntactic constituent:

- Constituents with nouns as heads will be **noun phrases** (NP)
- Constituents with verbs as heads will be **verb phrases** (VP)
- Constituents with adjectives as heads will be **adjectival phrases** (AdjP/AP)
- Constituents with prepositions as heads will be **prepositional phrases** (PP)

Across different syntactic constituents, the blueprint remains the same, but the labels on the tree differ.



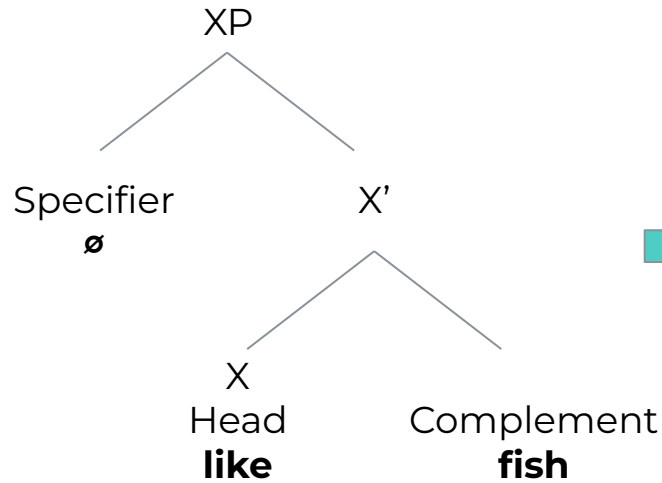
# Noun Phrase



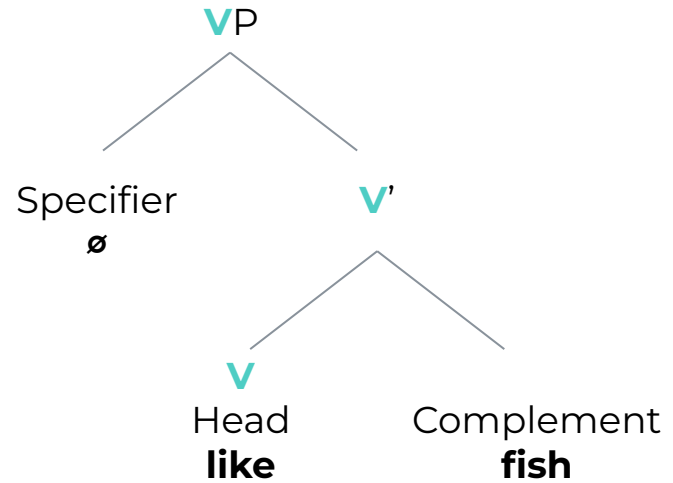
[The cats of Reykjavík] like fish

[The cats of Reykjavík] like fish

# Verb Phrase



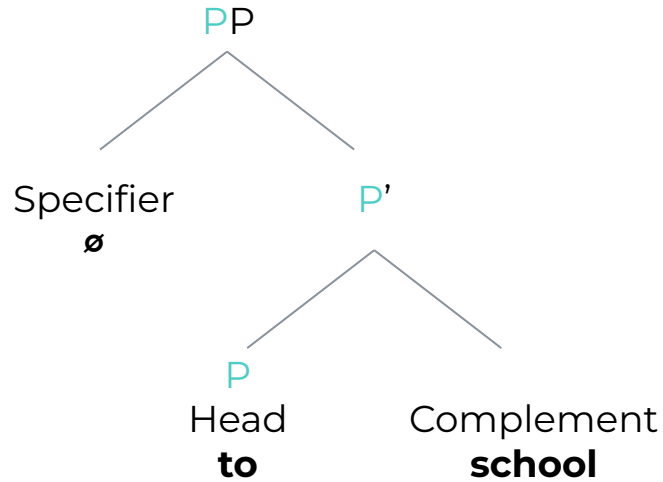
They [like fish]



They [like fish]

# Prepositional Phrase

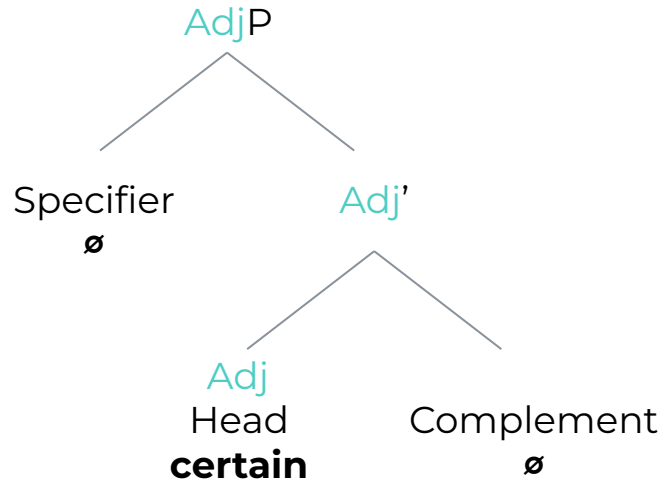
---



[to school]

# Adjectival Phrase

---



She is [certain]

# Recap, Heads

---

The head is the **obligatory** nucleus around which a phrase is built.

The head **defines the type** of syntactic constituent.

We have

- **noun phrases** (NP)
- **verb phrases** (VP)
- **adjectival phrases** (AdjP/AP)
- **prepositional phrases** (PP)

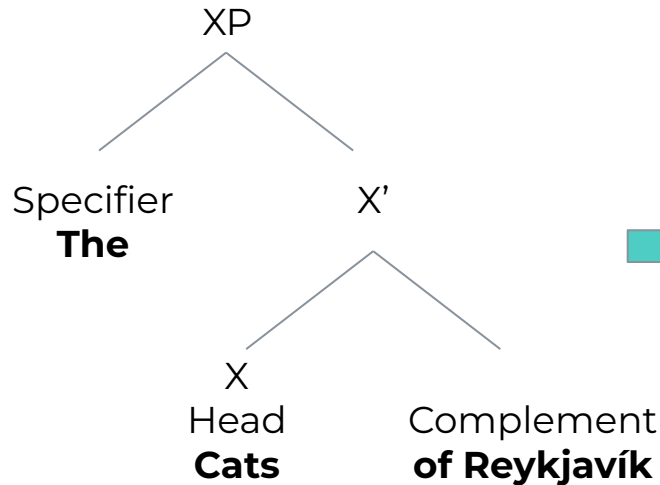
Across different syntactic constituents, the blueprint remains the same, but the labels on the tree differ.

# 3.

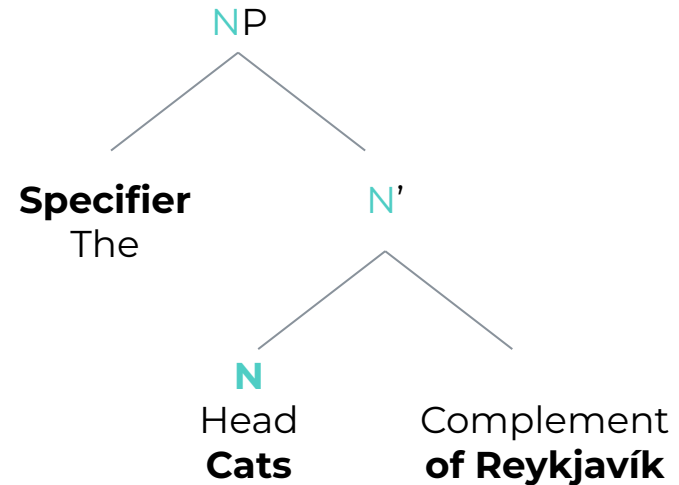
## Specifiers

Let's start with  
the first set of  
slides

# Noun Phrase



[The cats of Reykjavík] like fish



[The cats of Reykjavík] like fish

# Specifiers

---

The type of specifier that appears in a particular phrase depends on the category of the head.

<b>Category</b>	<b>Typical Function</b>	<b>Examples</b>
Determiner (D)	Specifier of N	<i>The, a, this, every</i>
Adverb (Adv)	Specifier of V	<i>Often, always, peacefully</i>
Degree word	Specifier of Adj	<i>very, quite, more</i>



# Specifiers

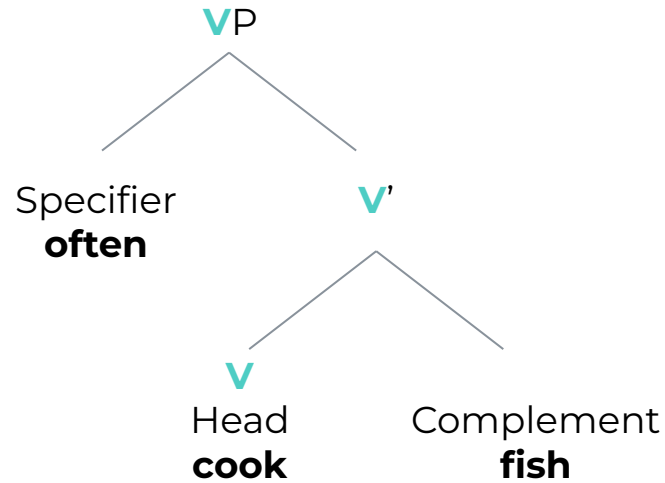
---

Specifiers help make the meaning of the head more precise:

- [**the** cats]                      “the” indicates that the speaker is thinking of specific cats.
- [**always** like fish]              “always” indicates that the event described by the verb always occurs.
- [**very** certain]                    “very” indicates that the extent to which the property of being certain is manifested.

# Verb Phrase

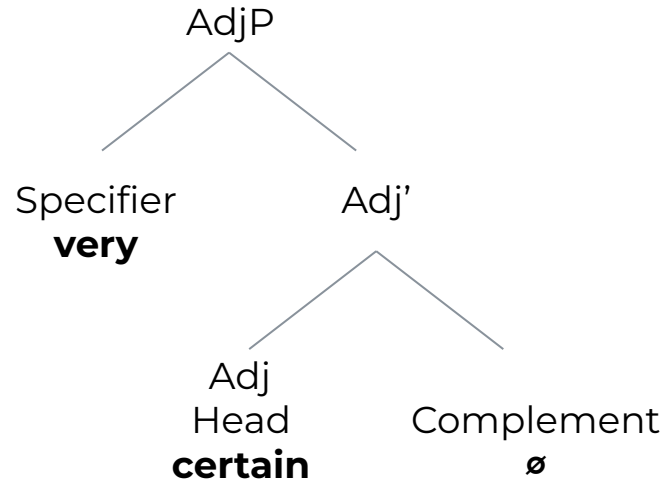
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They [often cook fish]

# Adjectival Phrase

---



She is [very certain]

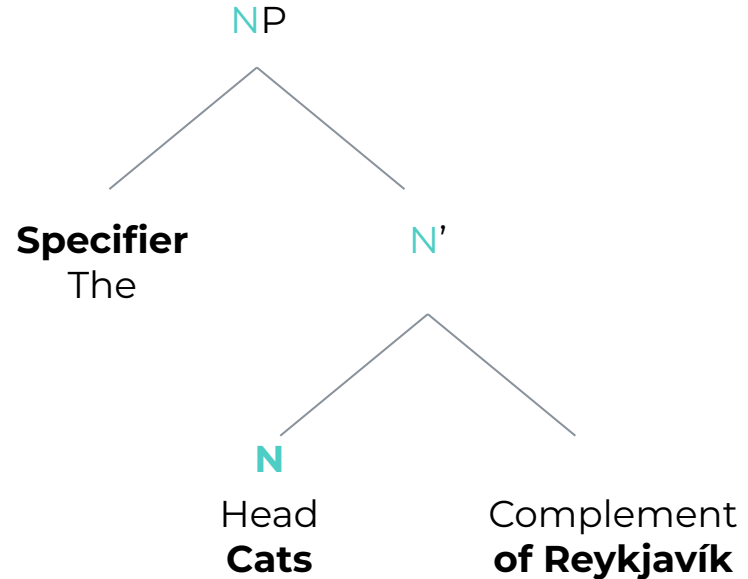
4.

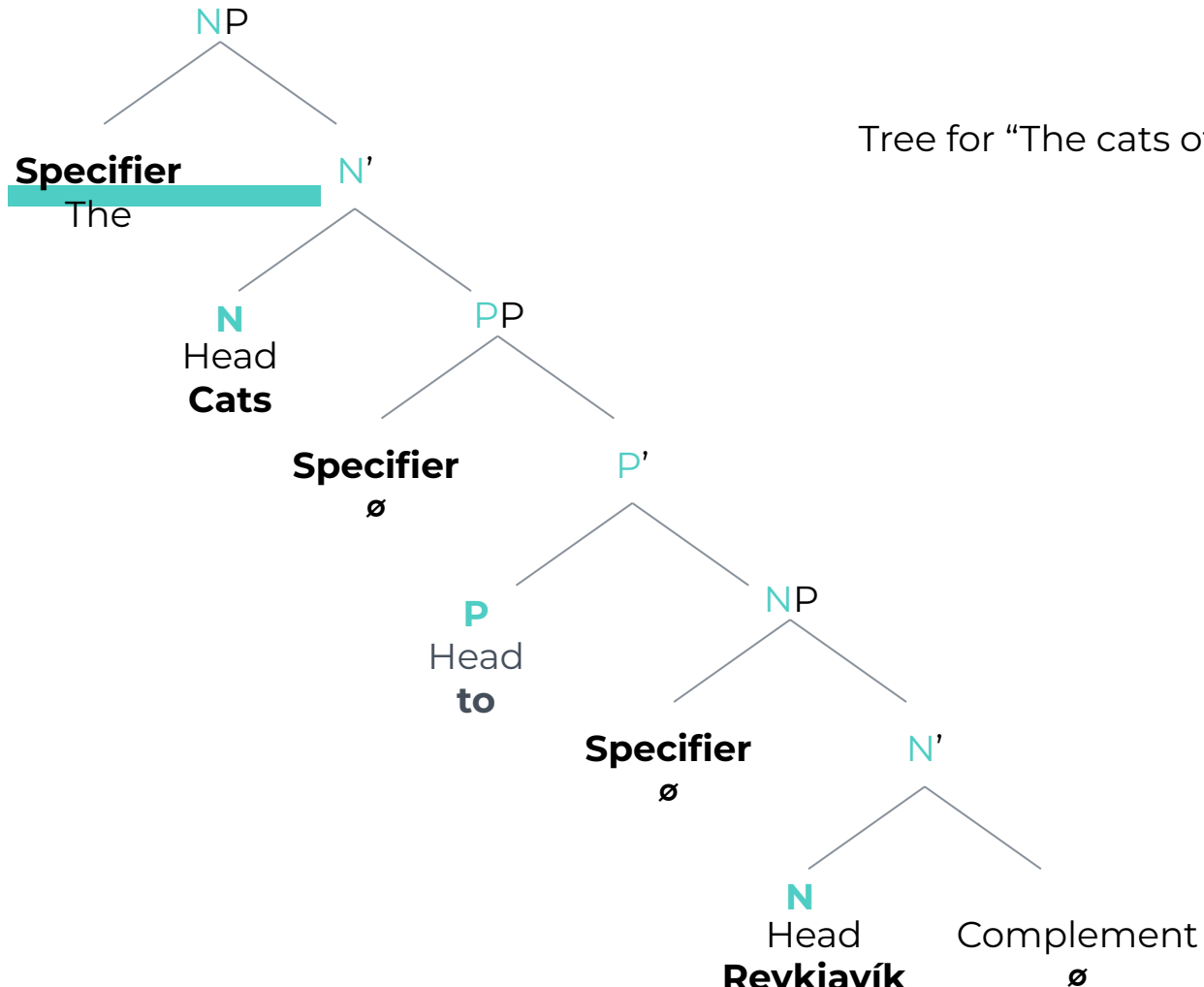
# Complements

Let's start with  
the first set of  
slides

# Complements

- Some phrases feature complements.
- Complements often provide information on the entity described by the head.
- Complements are phrases themselves, so they have an internal structure.





Tree for "The cats of Reykjavík"

# 5.

## Drawing Trees

Let's start with  
the first set of  
slides

# How do we draw trees?

---

You won't be able to draw trees easily until you literally do dozens of them.

There are two ways to go about drawing a tree:

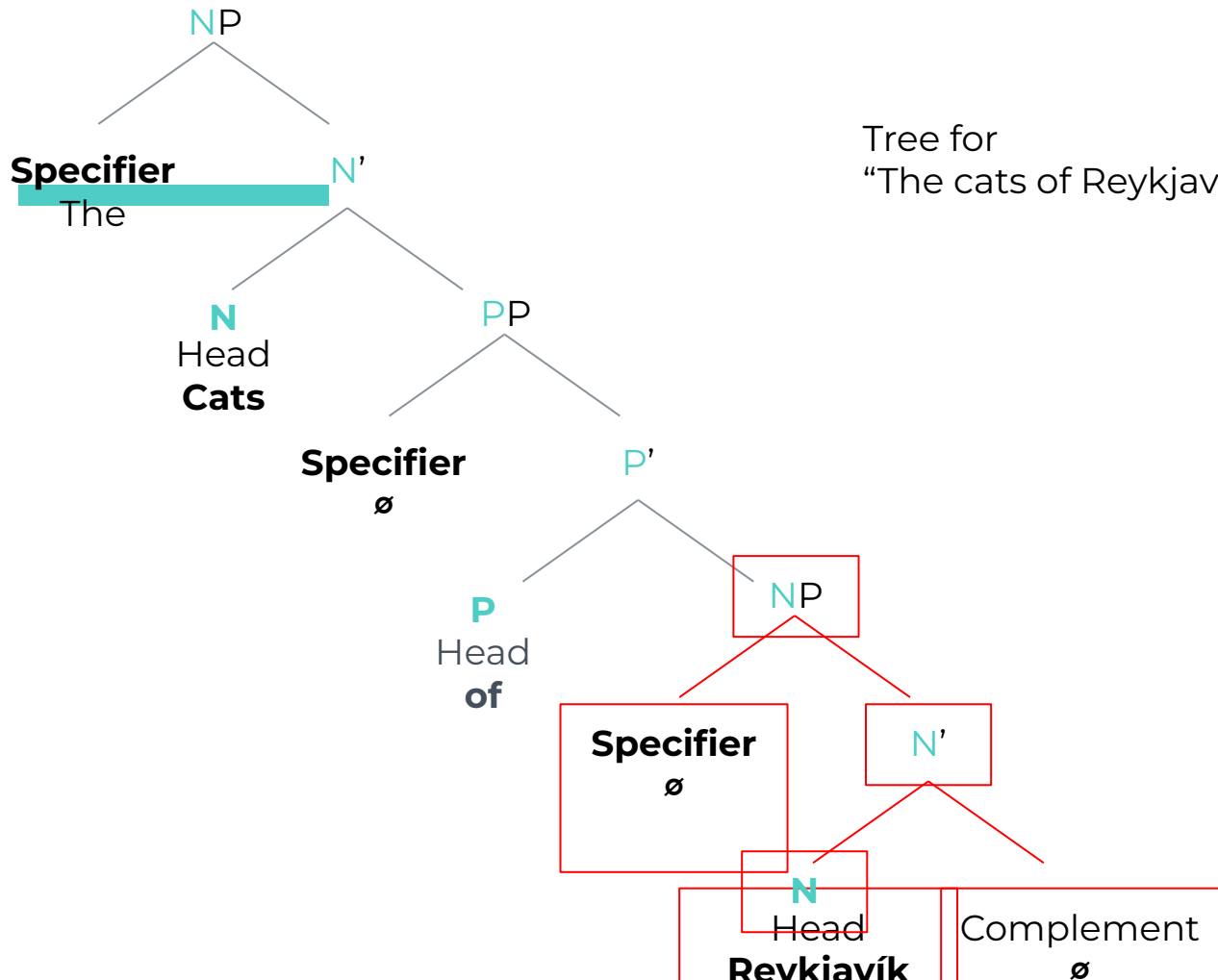
- ▣ You start at the bottom and work your way up to the top node (beginner-friendly mode)
- ▣ You start with the top node and work your way down.



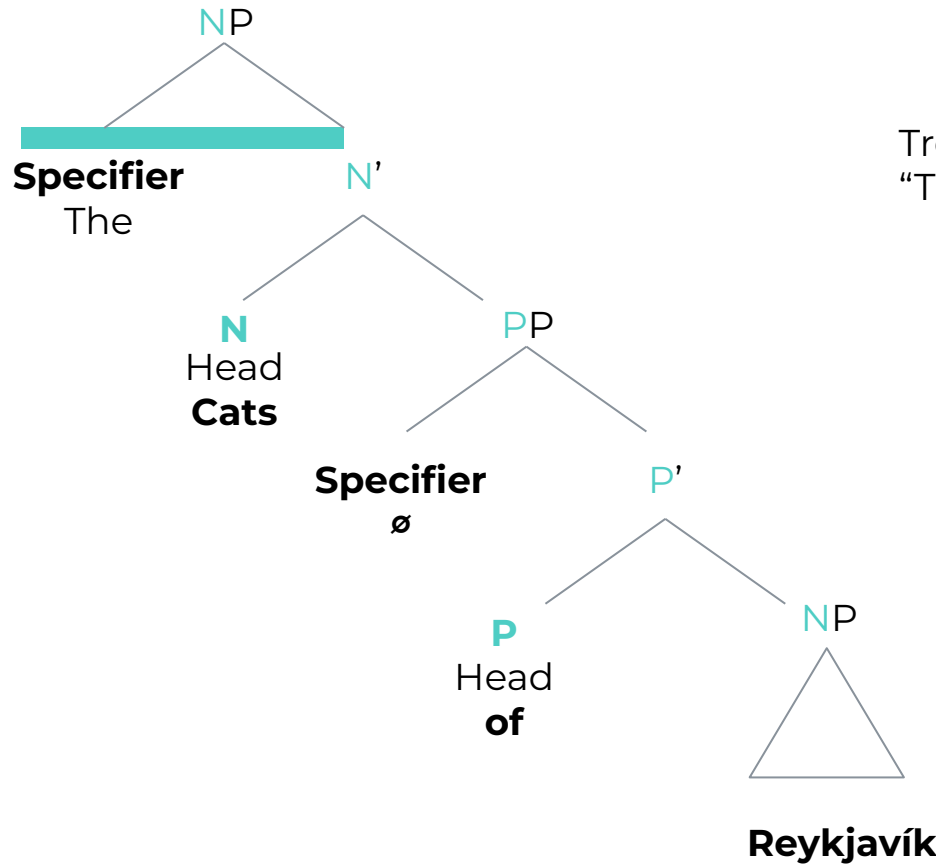
# Tips and tricks

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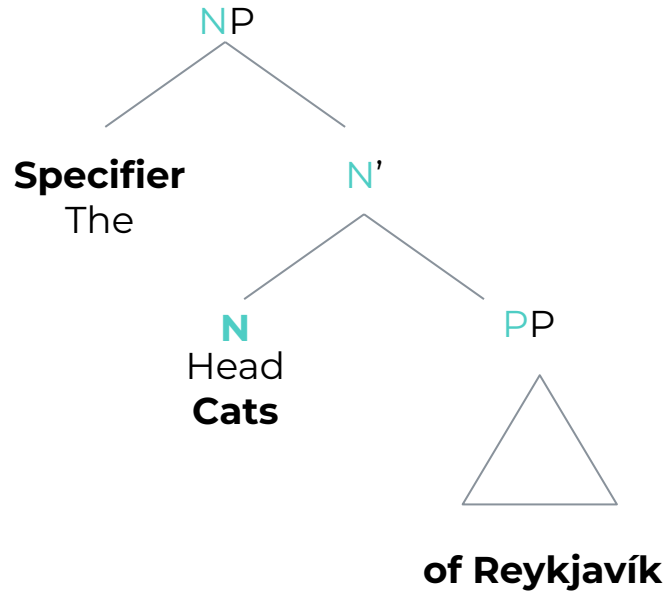
If you are not interested in showing the internal structure of complements and specifiers (or you don't have the space), **you can use triangles** in place of the full X-bar schema.



Tree for  
"The cats of Reykjavík"



Tree for  
"The cats of Reykjavik"



Tree for  
“The cats of Reykjavík”



NP



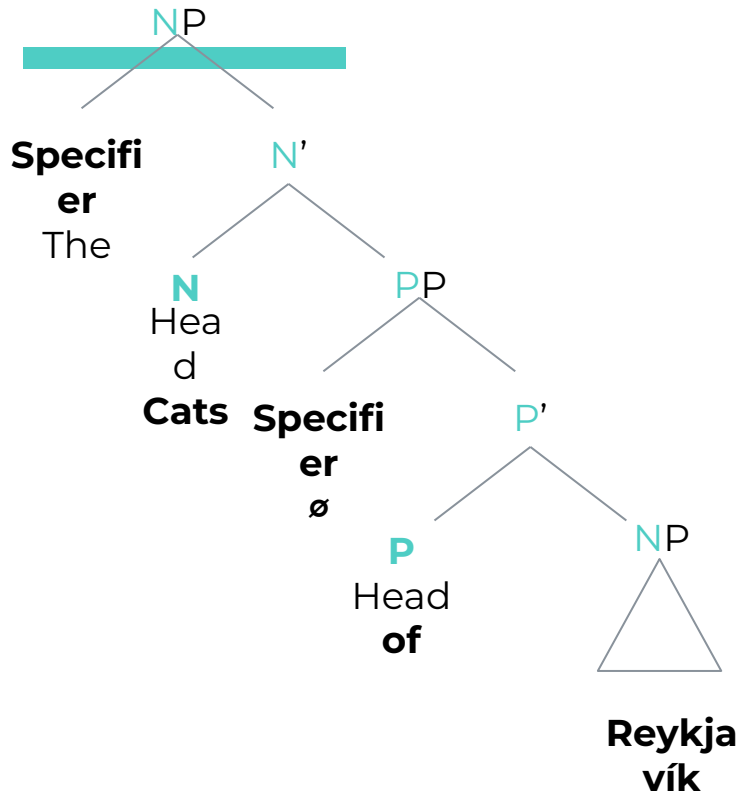
**The cats of Reykjavík**

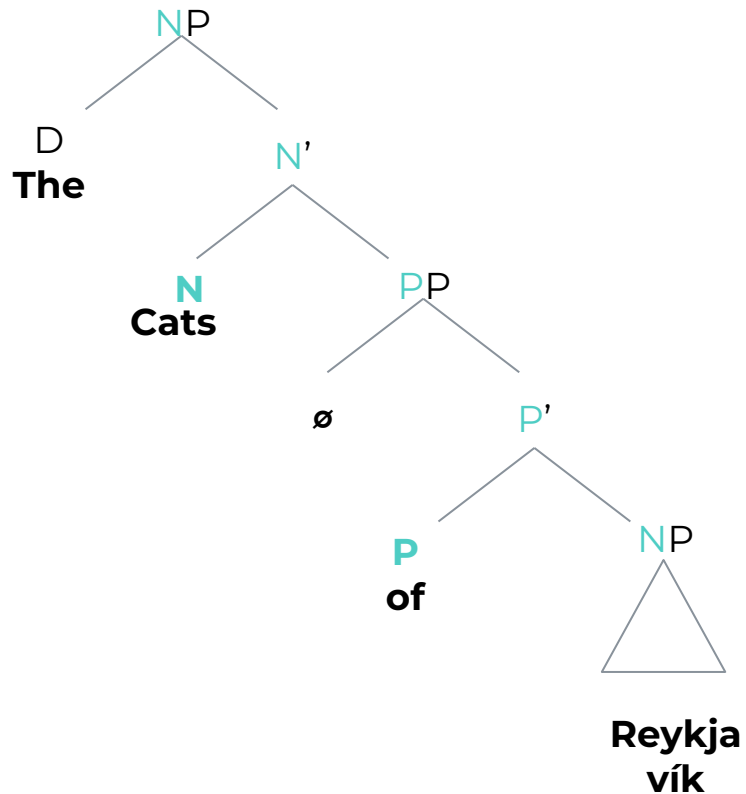
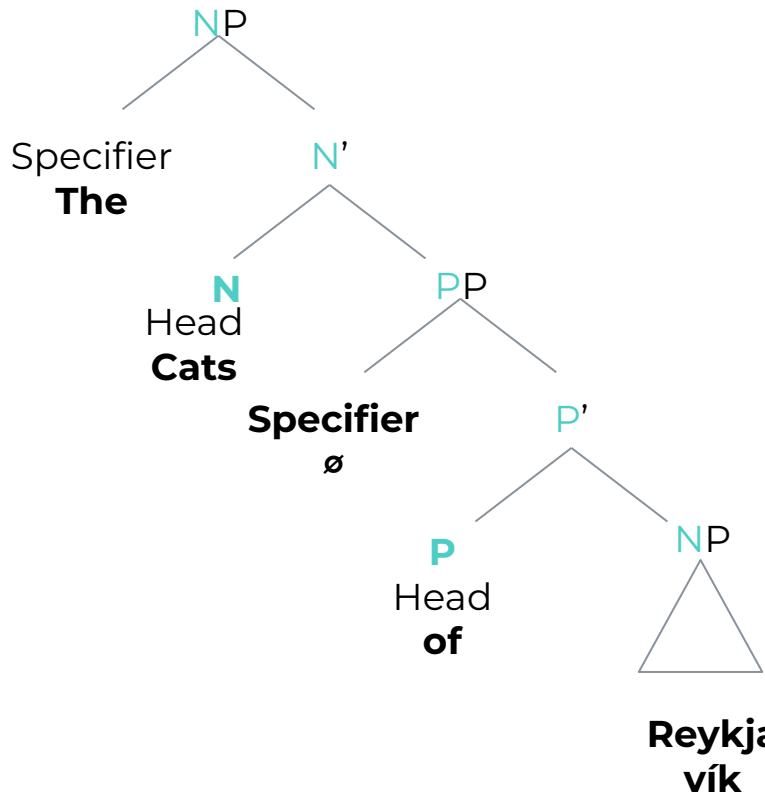
Tree for  
“The cats of Reykjavík”

## Tips and tricks - 2

---

You don't need to write down “complementizer” nor “specifier”.





Cleaned-out Trees



# Let's practice!

---

Let's draw trees for the following constituents:

- a) Geneva
- b) The noise of the ocean
- c) Every zoo of the world
- d) Always try
- e) So witty
- f) Less bleak
- g) Never surrender

# 6.

## Drawing Trees: Sentences

Let's start with  
the first set of  
slides

# Drawing sentences

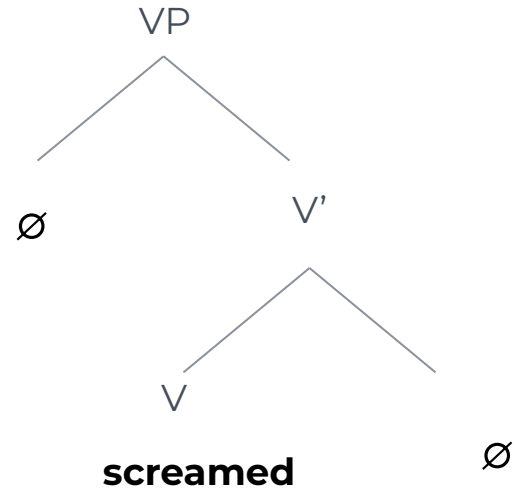
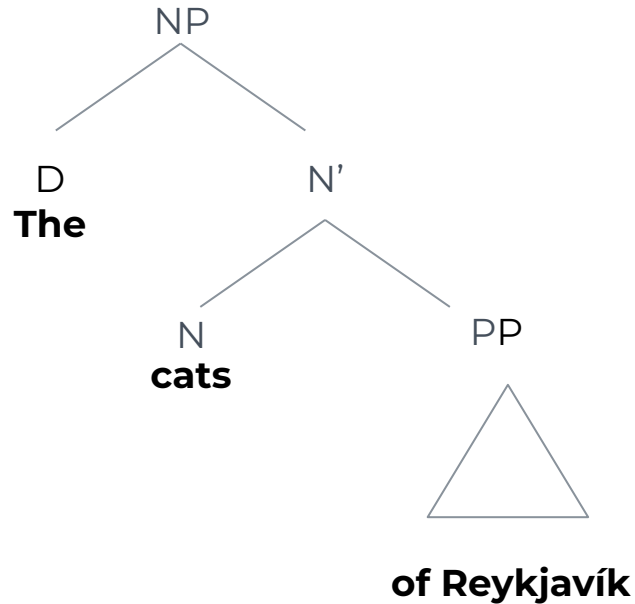
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The largest unit of syntactic analysis is the sentence.

Sentences typically consist of a subject (generally a NP) and a verb (VP).

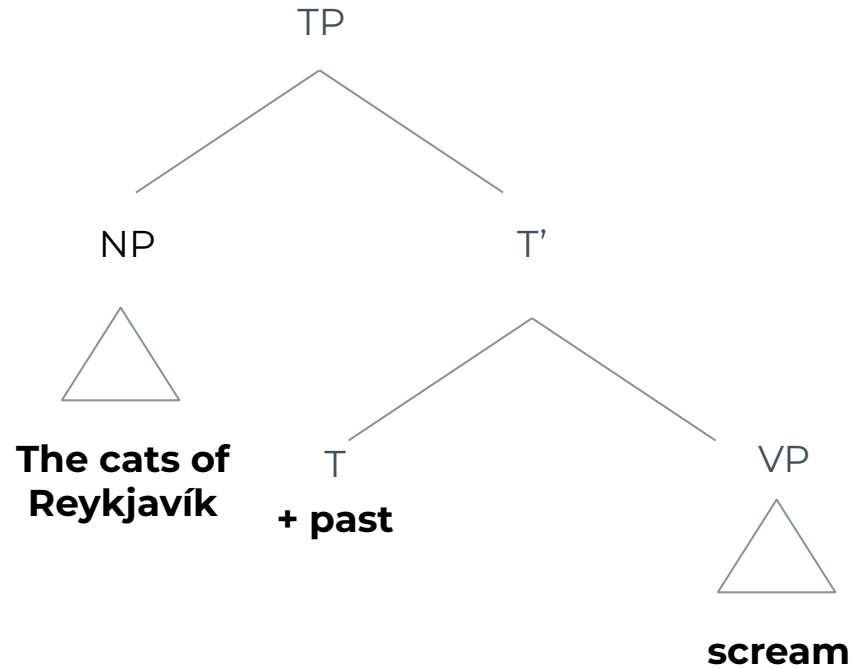
**[The cats of Reykjavík NP] [screamed VP]**

# Drawing sentences



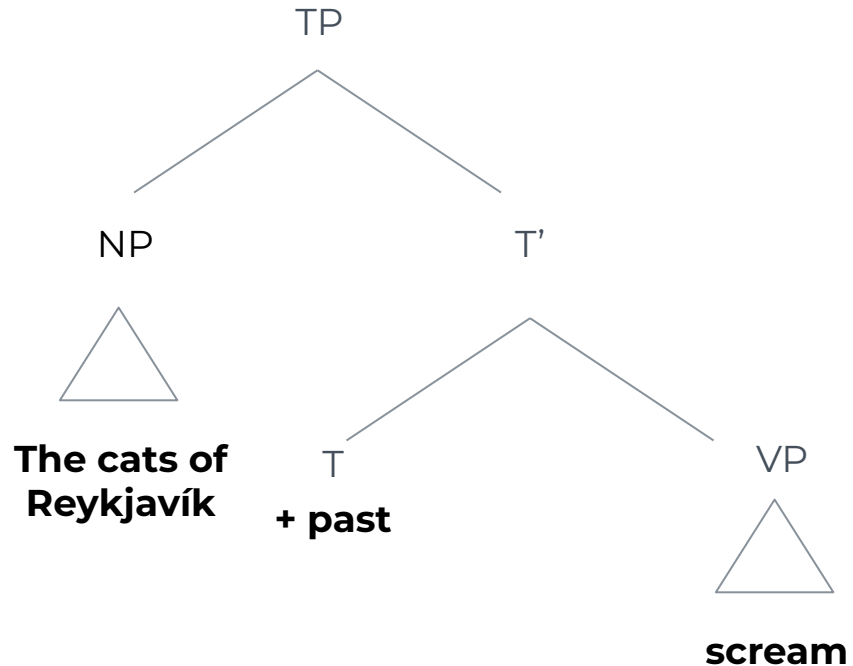
# A new node: TP

---



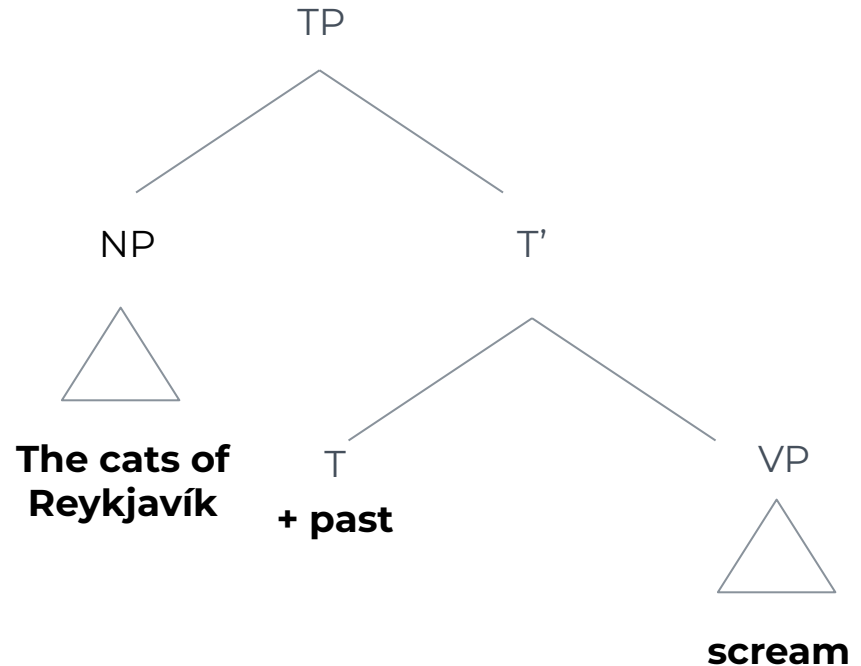
# A new node: TP

- T stands for Tense.
- “Tense” captures the tense information of the verb (e.g. whether the verb is in the present or past tense).
- In earlier works, T is referred to as “I” or “Infl”, which stands for “Inflection”.



# A new node: TP

This structure has the advantage of **giving sentences the same internal structure of any other constituents:** sentences contain a specifier (the subject) and a complement (the verb).



# Things to remember

---

- Every sentence contains a verb, so every sentential tree must have a VP
- Every VP must be the complement of a TP
- In English, the T head position will be filled by a modal auxiliary, or a tense specification.
- The subject will be in the specifier-of-T position.

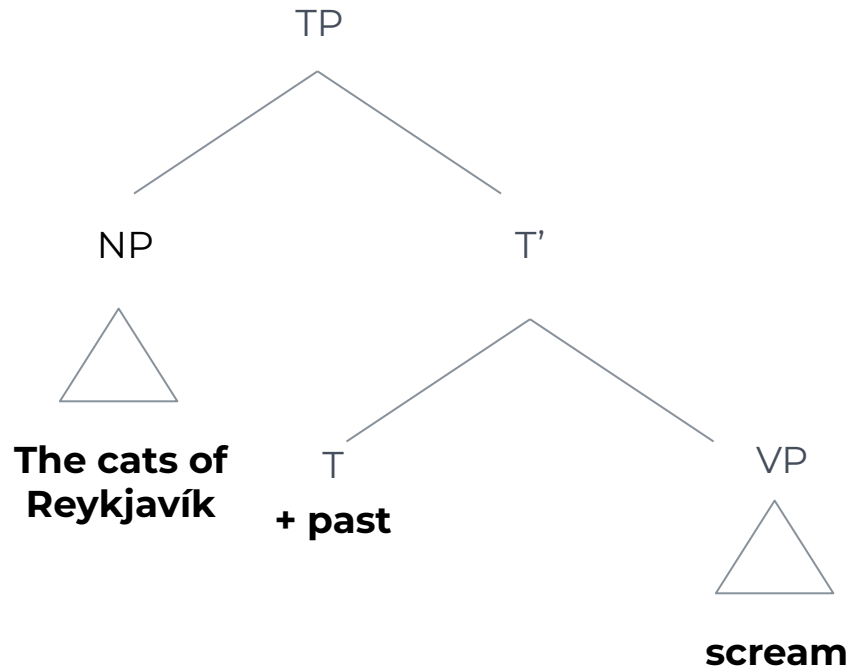


# A new node: TP

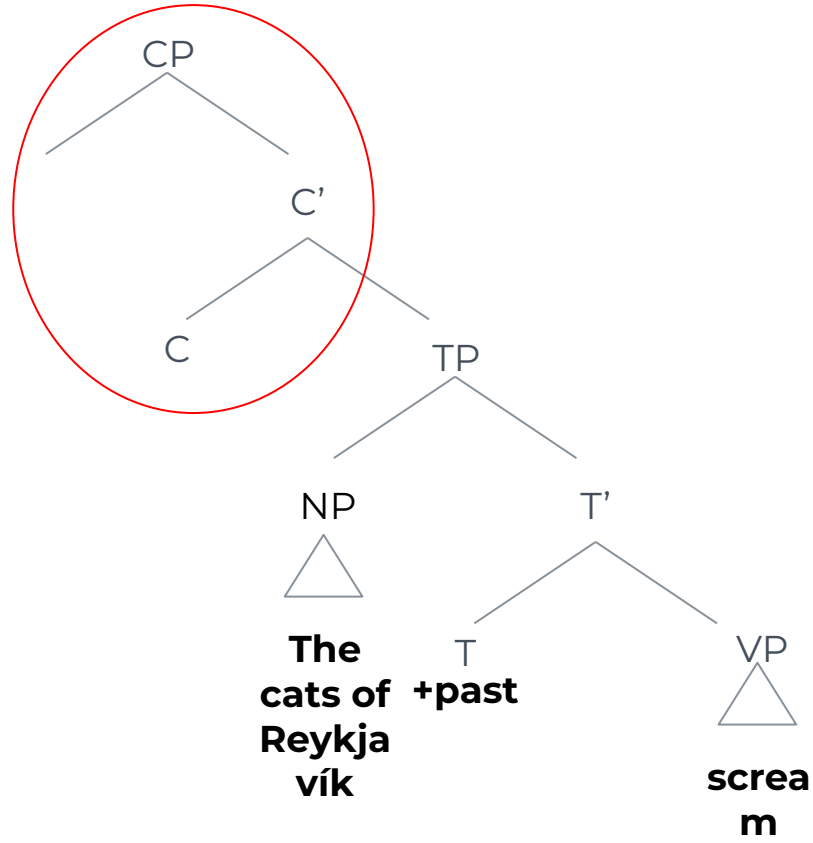
How do we represent the internal structure of the yes/no question

**“Did the cats of Reykjavík scream?”**

?

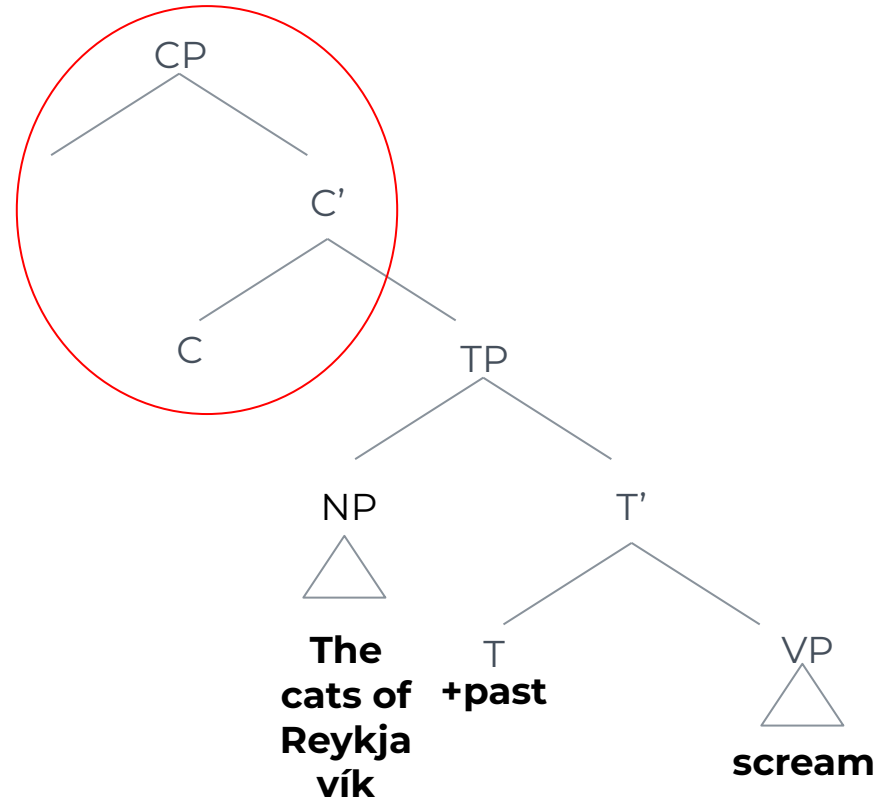


# A new node: CP



# A new node: CP

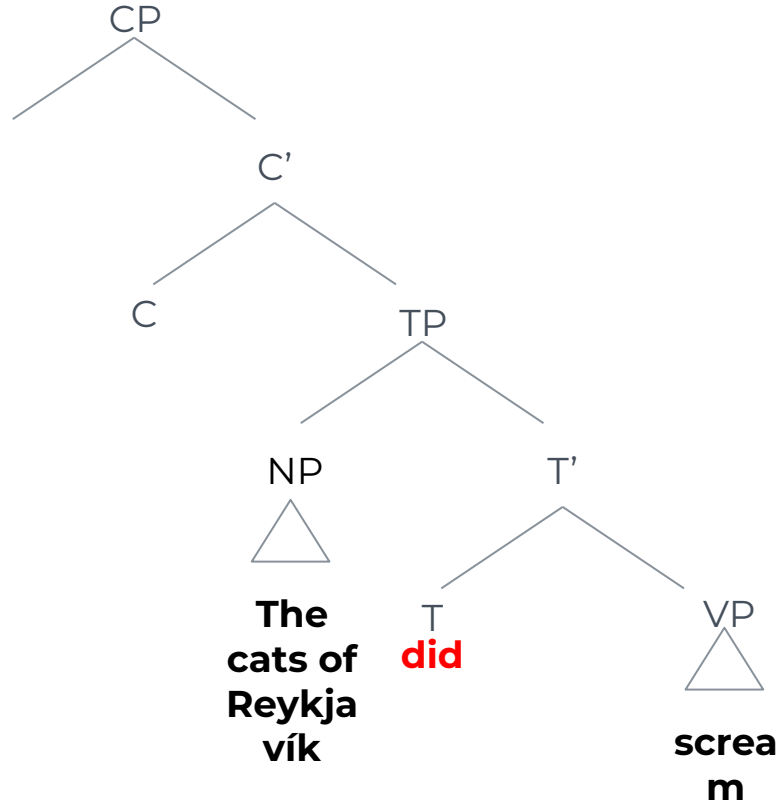
- C stands for “**Complementizer**”. CP then stands for *Complementizer Phrase*.
- What is a complementizer? Words like “if” and “that”, which we use to connect clauses, are complementizers.
  - a) “I said **that** the cats of Reykjavík scream”
  - b) “I wonder **if** the cats of Reykjavík scream”
- Complementizers are a **functional, closed** category.



# A new node: CP



“Do” insertion



# A new node: CP



“Do” insertion

