Grammatical Aspects of Language

Syntax: The Sentence Patterns of Language

Chapter 2 (p. 77 – 129); Exercises (p. 130 – 138)

V.Fromkin, R.Rodman, & N.Hyams (2007/2011)
Introduction to language (international edition)

What is Syntax?

- Any speaker of a human language can produce and understand an infinite number of sentences.
  - Ways of making the number of sentences limitless: Modification, Clause insertion, Coordination
  - The lexicon size is finite; the number of rules is finite; but the number of sentences is infinite (!)
  - Sentences are composed of discrete units that are combined by rules.
- Sentences are not stored in brain, but the rules of combining discrete units make the number of sentences infinite.
- Syntax is the part of grammar that represents speaker's knowledge of sentences and their structure.

What syntactic rules of a grammar account for

- The grammaticality of sentences
- Word order
- Hierarchical organization of sentences
- Grammatical relations such as subject and object
- Whether different structures have differing meanings or the same meaning
- The creative aspect of language

Grammaticality

- Grammaticality judgments are neither idiosyncratic nor capricious, but are determined by the rules that are shared by all speakers of a language.
- Sequences of words that conform to the rules of syntax are well formed or grammatical, otherwise — ill formed or ungrammatical
- What grammaticality is not based on:
  - whether the sentence is heard or not
  - whether the sentence is meaningful or not
  - whether interpretable or not
  - whether true or not

Sentence structure

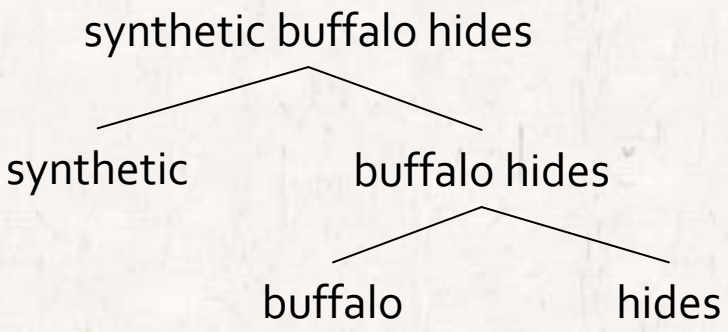
Constituency & Constituency Tests

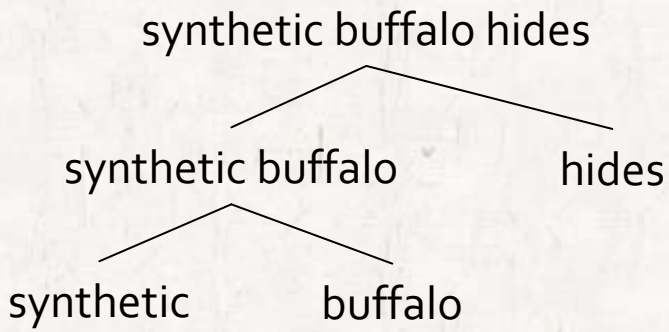
Evidence for constituent structure

- Linguistic test
  - Question & answer
    - In a sentence "the child found the puppy"
    - What did you find?
    - → "the puppy" but not "found the"
  - Relocation
    - It was the puppy the child found
    - The puppy was found by the child
  - Pronoun substitution
    - Where did you find the puppy?
    - → "I found him in the park"
    - John found the puppy and so did Bill.

Ambiguous constituent structure

- Every sentence in a language is associated with one or more constituent structures.
- If a sentence has more than one constituent structure → ambiguous





Syntactic category

- Definition: A family of expressions that can substitute for one another without loss of grammaticality
- Example: A police officer found the puppy in the garden.
  - "Your neighbor", "This yellow cat", or "He" in place of "A police officer" → NP (Noun Phrase)
- Types
  - Phrasal category: NP, VP, PP, AP, S …
  - Lexical category: N, A, V, P, Adv, Aux … → traditionally called parts of speech (POS)
- Each lexical categories has a corresponding phrasal category.

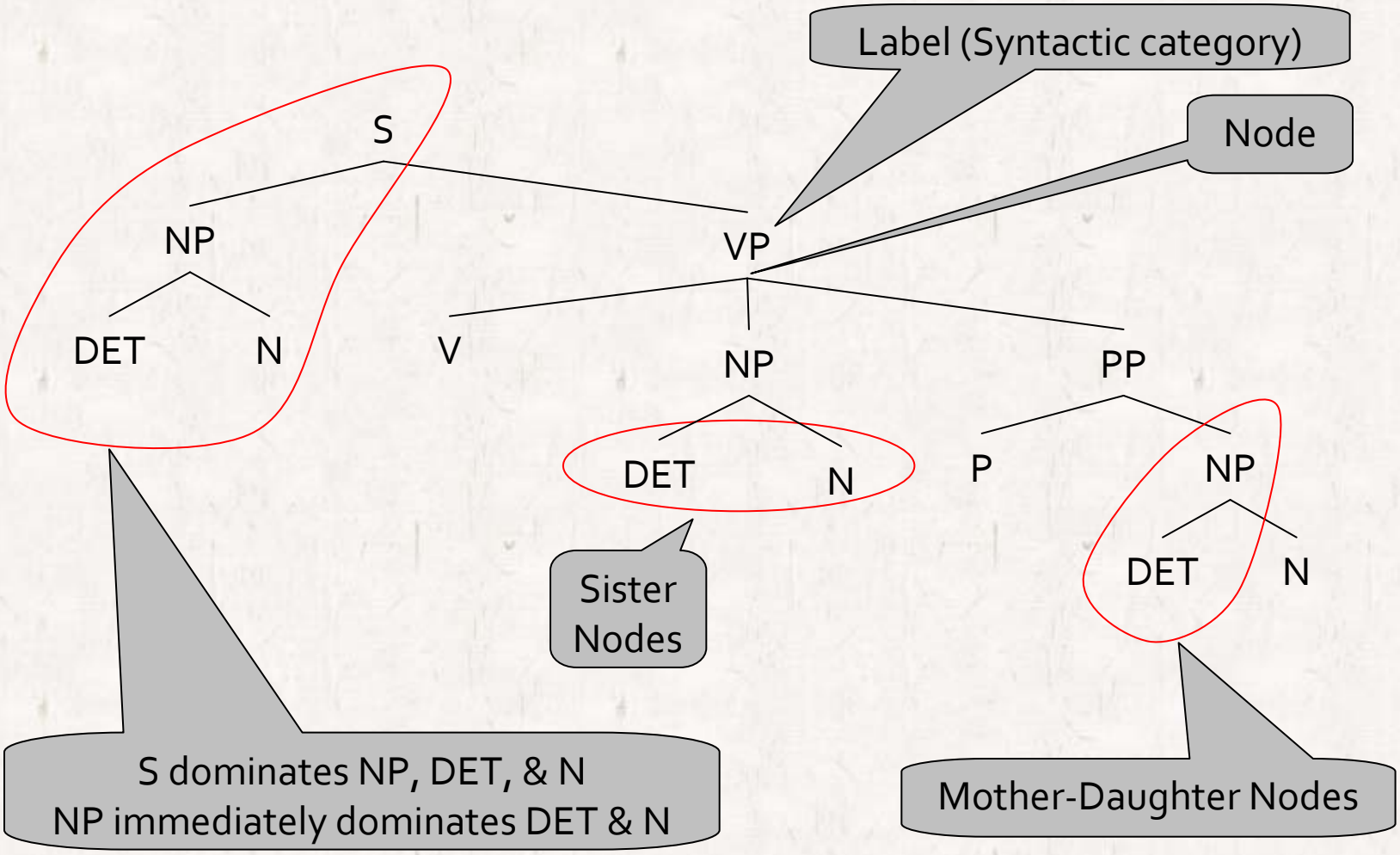
Syntactic category

- Functional categories
  - Det (a, the, this, that, each, every) & Aux (be, have, will, shall, could)
  - have a grammatical function rather that a descriptive meaning
- Language universal property
  - N, V, NP are present in the grammars of all human languages.
- Our knowledge of syntactic classes is revealed
  - when we substitute equivalent phrases, and
  - when we use the various syntactic tests

Phrase Structure Trees (PS tree)

- Also called constituent structure trees
- Tree diagrams with syntactic category information provided
- A formal device for representing the knowledge that a speaker has of the structure of sentences in his language
- Showing that a sentence is both a linear string of words and a hierarchical structure with phrases nested in phrases
- Terms: node, label (syntactic category), domination, immediate domination, terminal string, head, complement

PS-Trees: terminology



PS rules

- define the allowable structures of the language
- make predictions about structures that we may not have considered when formulating each rule individually
- these predictions can be tested
  - if they are not validated, the rules must be reformulated
  - so that all and only the allowable structures are generated
- the following rules form a recursive set because S and VP occur in both left and right side of the rules
  - 7. VP → V CP
  - 8. CP → C S
  - 1. S → NP VP

Competence vs. Performance

- The embedding of categories within categories is common to all languages.
- All speakers have as part of their linguistic competence the ability to embed phrases and sentences within each other ad infinitum.
- However, as the structures grow longer, they become increas ingly more difficult to produce and understand due to *short-term memory limitations*, *muscular fatigue*, *breathlessness*, etc.
- Nevertheless, these very long sentences would be well-formed according to the rules of the grammar.

Homework

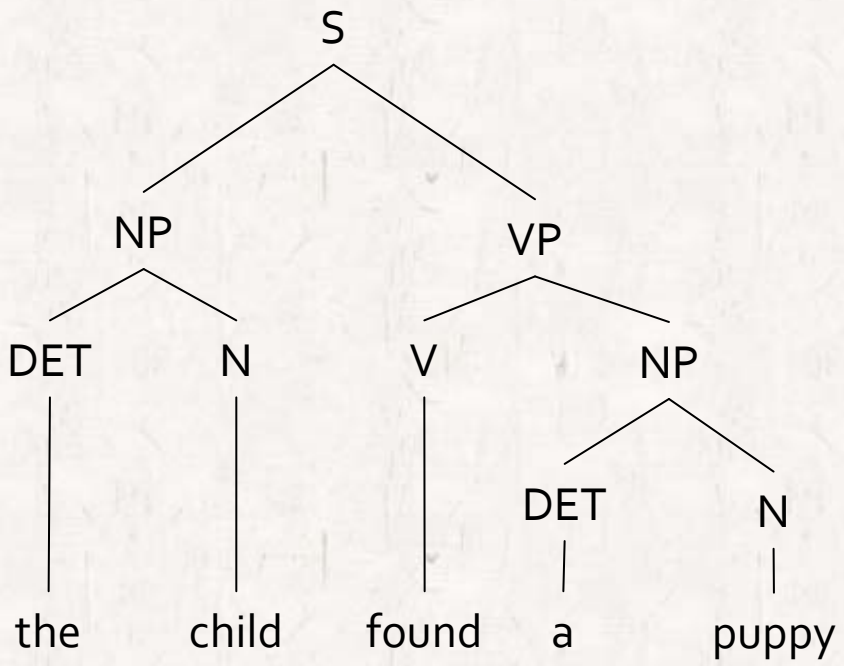
- Exercises 1-10 after the syntactic chapter.

Head and Complements

- PS-trees show relationships among elements in a sentence.
- The subject and direct object of the sentence can be structurally defined:

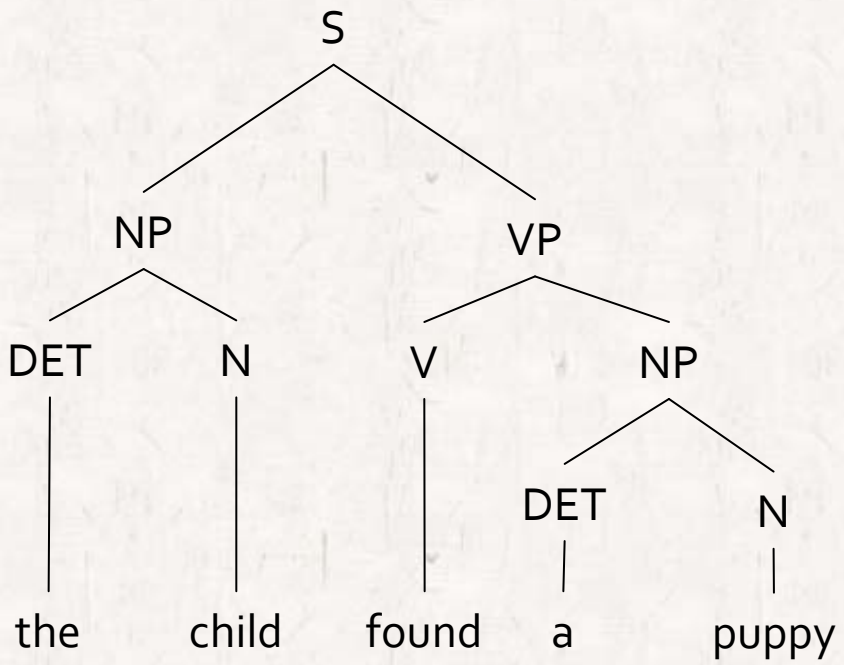
subject: the NP that is closest to (immediately dominated by) S (root)

direct object: the NP that is closest to (immediately dominated by) VP



Head and Complements

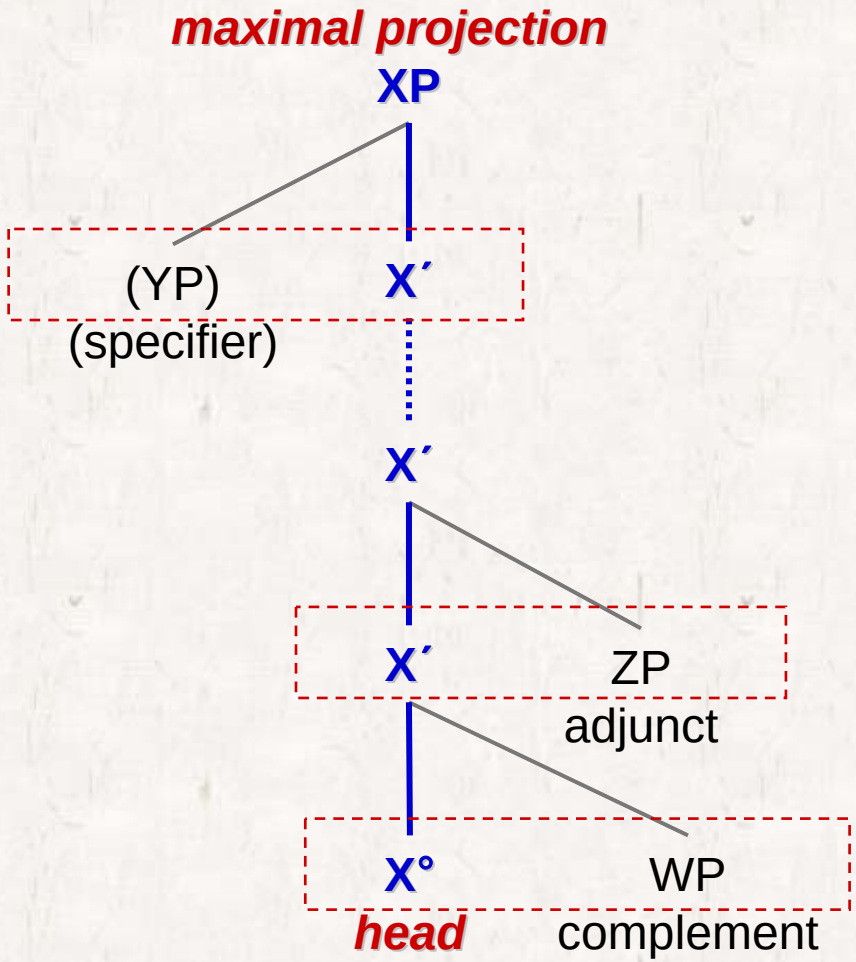
- Another kind of relation is that between the head of phrase and its sisters:
  - the lexical category of the head defines the type of the phrase
  - the sisters of the head in the phrase are complements (they complete the meaning of the phrase)



Head and Complements

- The information about the complement selected by a particular lexical item is called C-selection / subcategorisation.
- Complements
  - are closer to the head than modifiers
  - combine with the lexical head at an intermediate phrasal level
- Modifiers
  - may iteratively combine with such an intermediate phrase
  - Recall, however, that some modifiers have different status (e.g. determiner vs. adjectives modifying a noun)

Phrases as Head Projections: X-bar (X′) Scheme



Universal constraint on phrase structure

- Head and its complements are structurally closer
- Phrases restrict the influence of their heads (e.g. case assignment)

Structural distinction of <u>non-heads</u>

1. Complements (arguments) are phrases selected by the head
2. Adjuncts (modifiers) are not selected phrases
3. Specifiers complete head projections

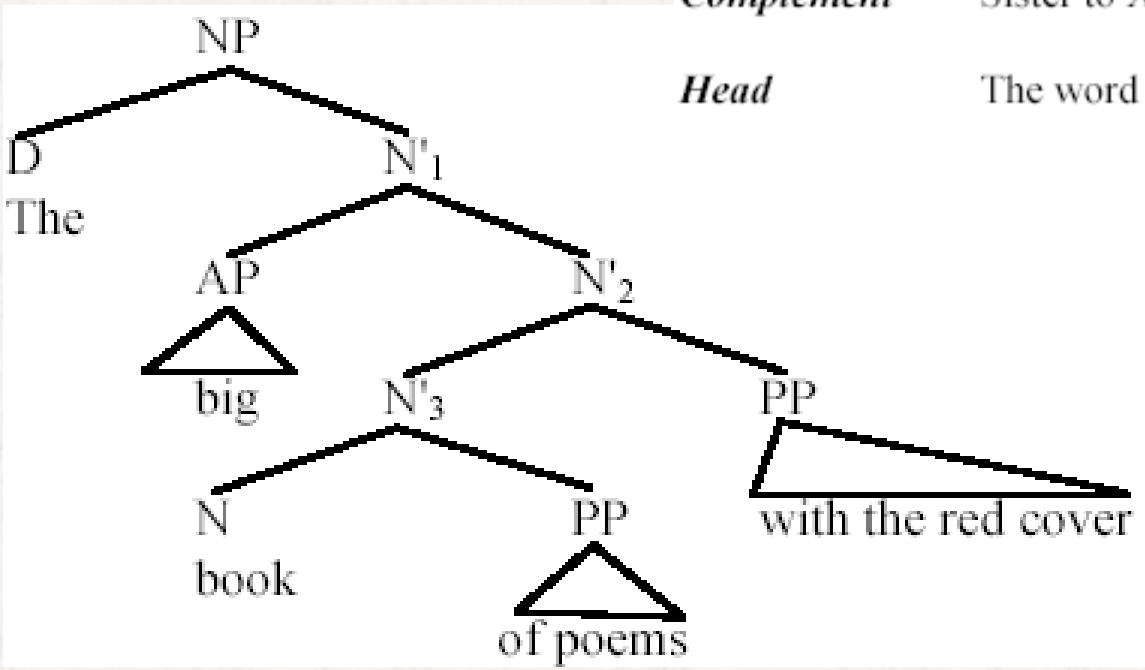
Generalisation of X-bar-rules

Specifier rule	XP → (YP) X' *or* XP → X' (YP)
Adjunct rule	X' → X' (ZP) *or* X' → (ZP) X'
Complement rule	X' → X (WP) *or* X' → (WP) X

NP → (D) N'	VP → V'	AP → A'	PP → P'
N' → (AP) N' *OR* N' (PP)	V' → V' (PP)	A' → (AP) A'	P' → P' (PP)
N' → N (PP)	V' → V (NP)	A' → A (PP)	P' → P (NP)

the big book of poems with the red cover

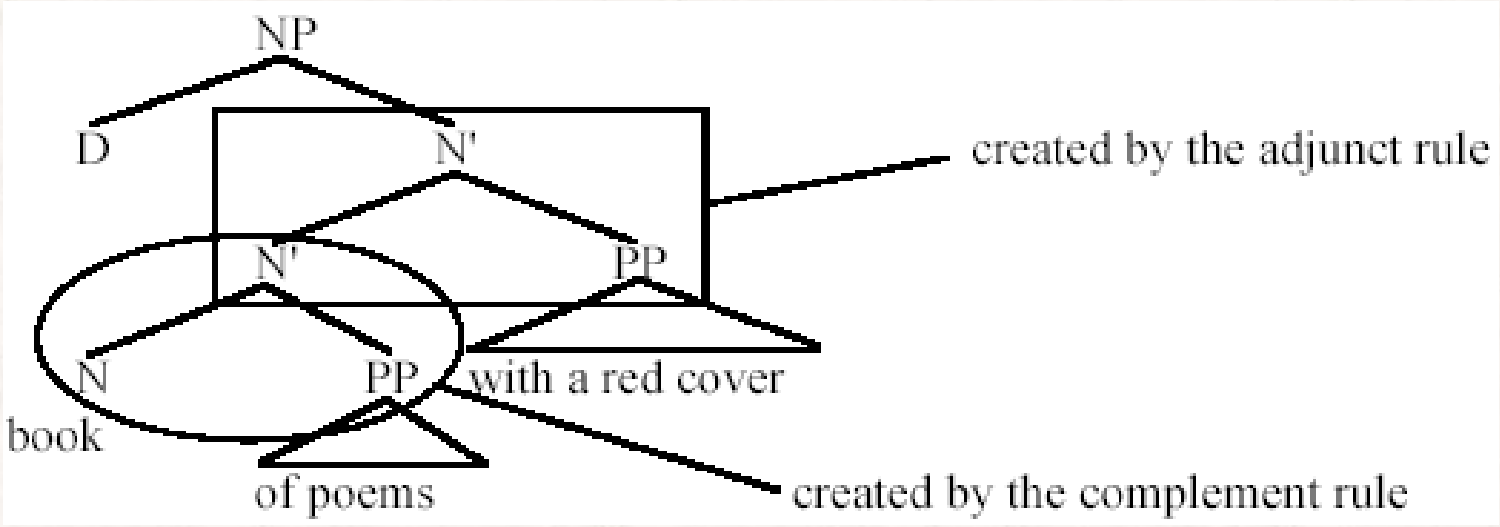
Specifier	Sister to X', daughter of XP.
Adjunct	Sister to X', daughter of X'.
Complement	Sister to X, daughter of X'.
Head	The word that gives its category to the phrase.

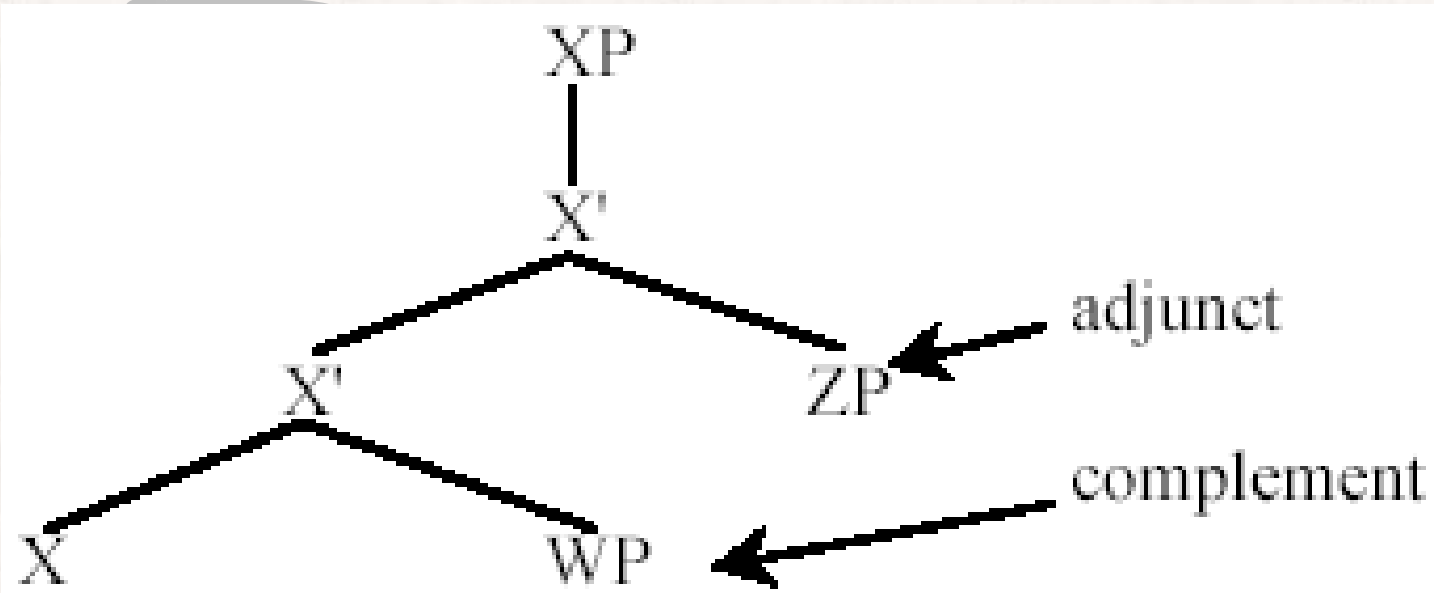


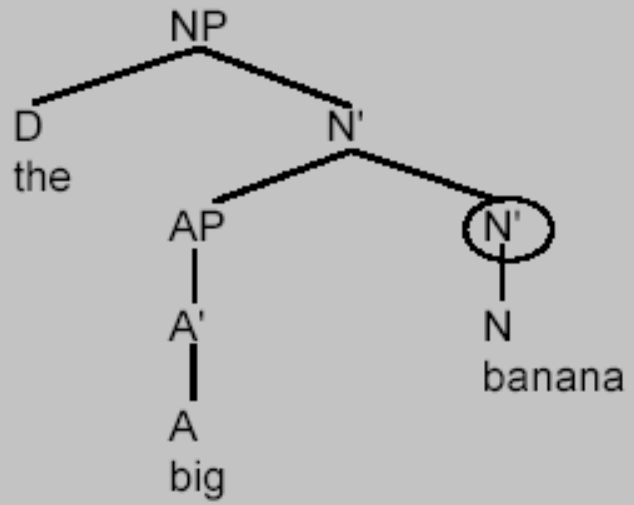
complement vs. adjunct

the book	[of poems]	[with a red cover]
head	*complement*	*adjunct*

Adjunct rule	X' → X' (ZP)
Complement rule	X' → X (WP)

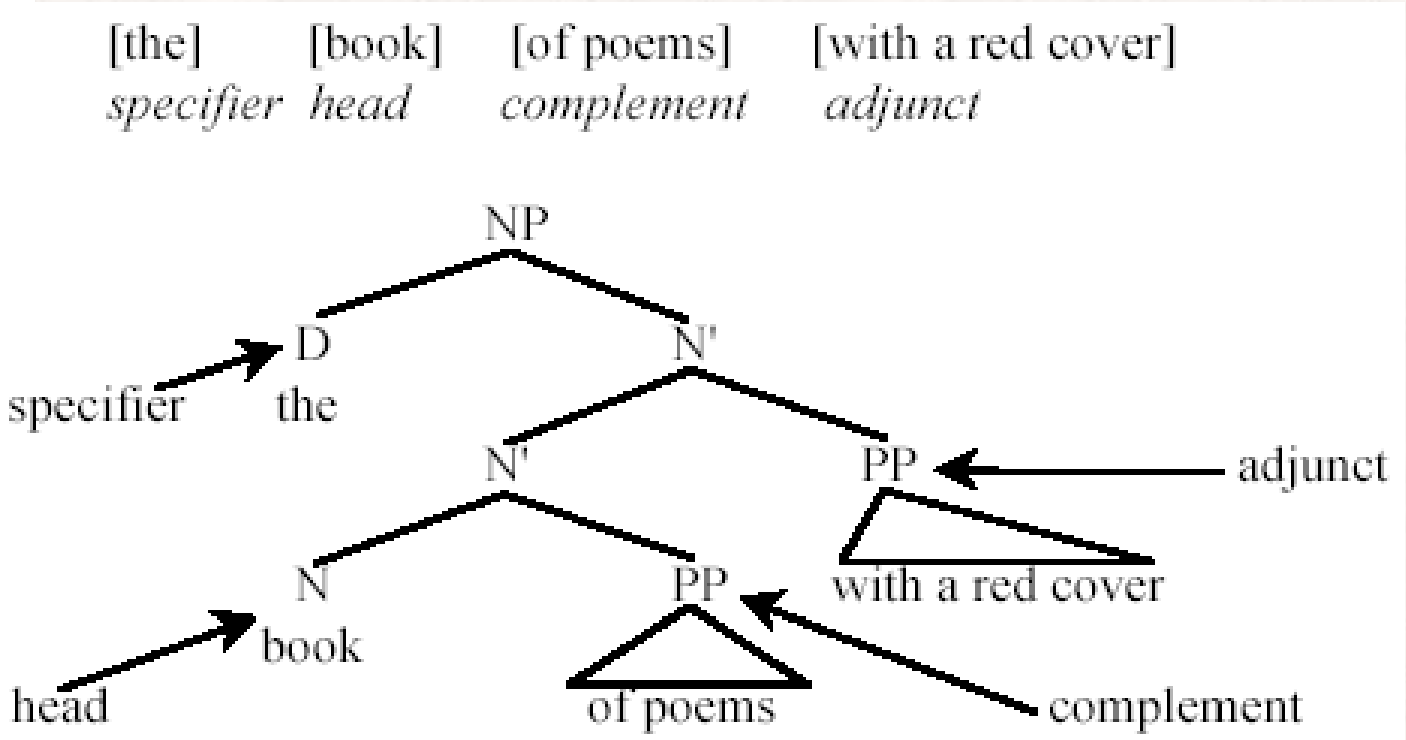




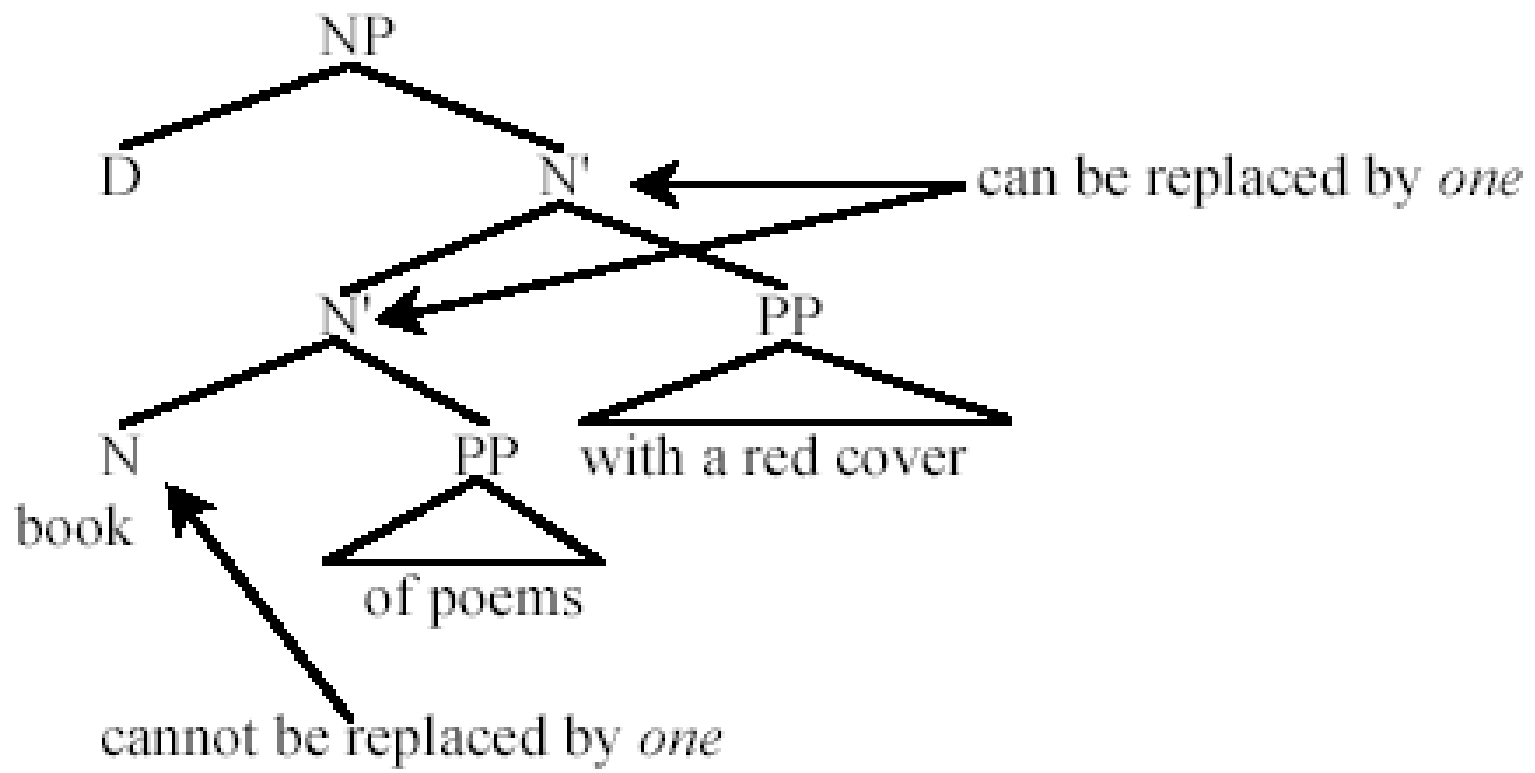


The circled N' here is crucial to make the AP an adjunct. Be careful when drawing your trees.

specifier

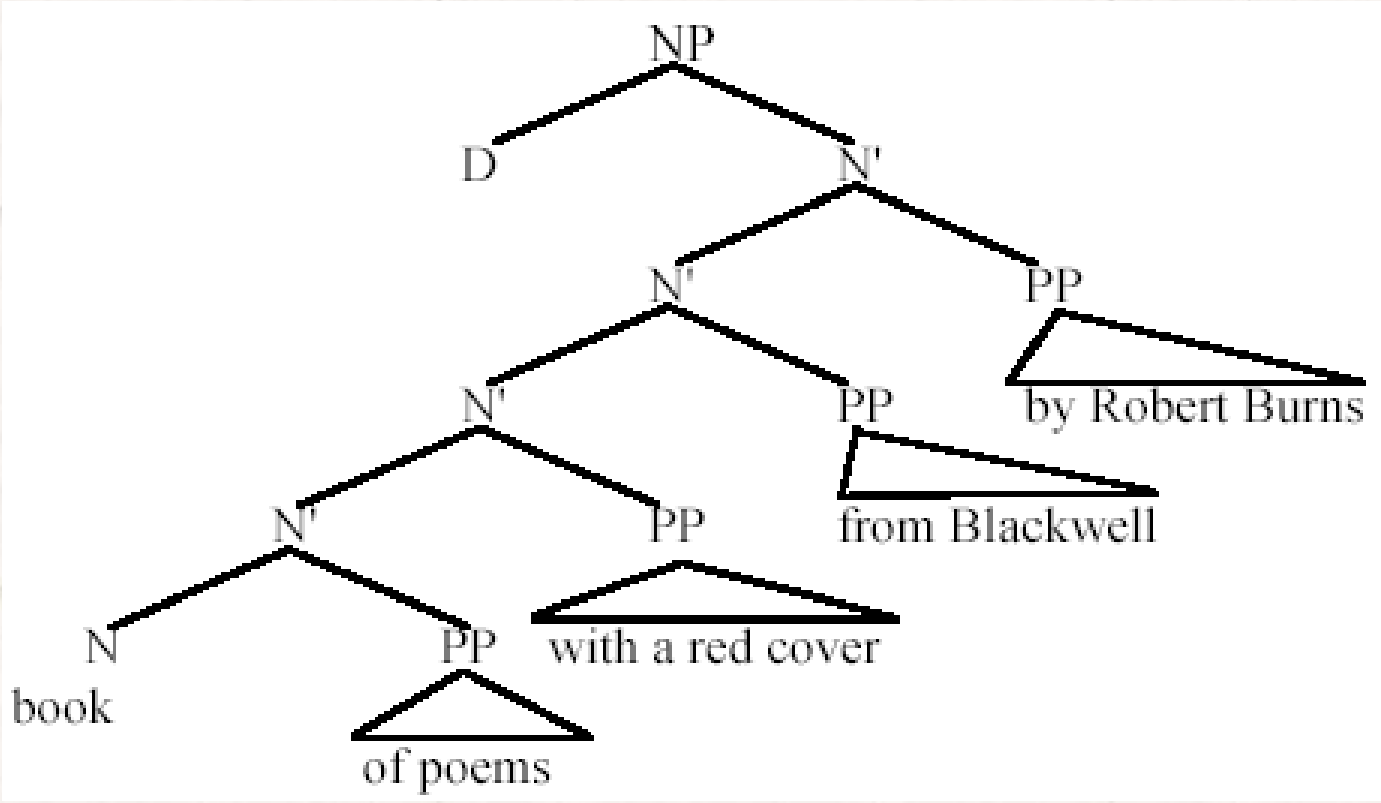

[the] [book] [of poems] [with a red cover]
specifier head complement adjunct
NP
D
N'
specifier
the
N'
PP
adjunct
N
PP
with a red cover
book
head
of poems
complement

English: „*one*“-replacement as a test for N´



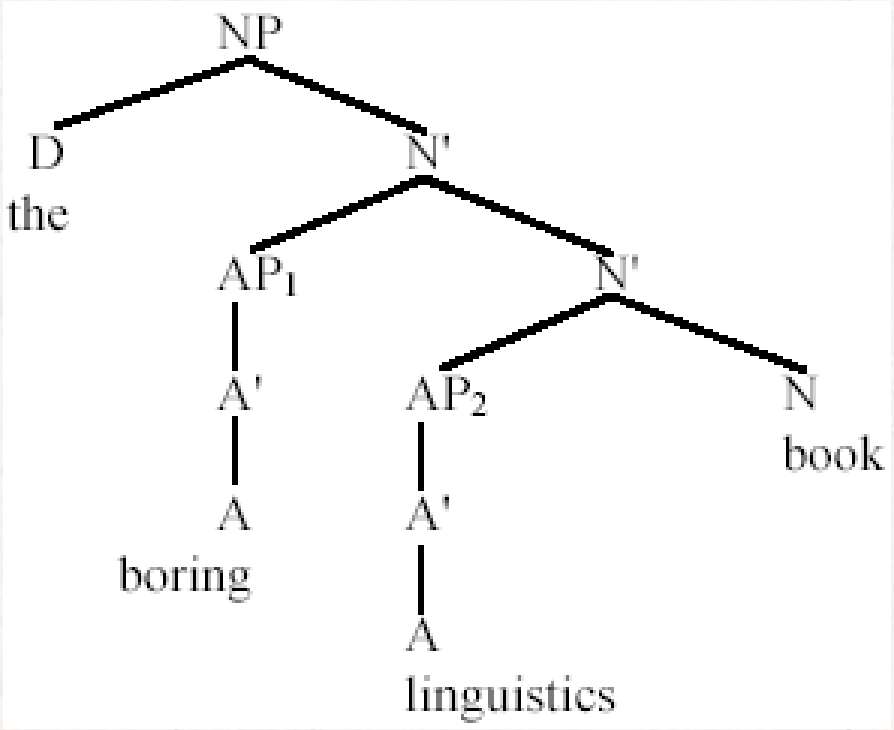
English: „*one*“-replacement as a test for N´

the book [of poems] [with a red cover][from Blackwell][by Robert Burns]
head *complement* *adjunct* *adjunct* *adjunct*



NP

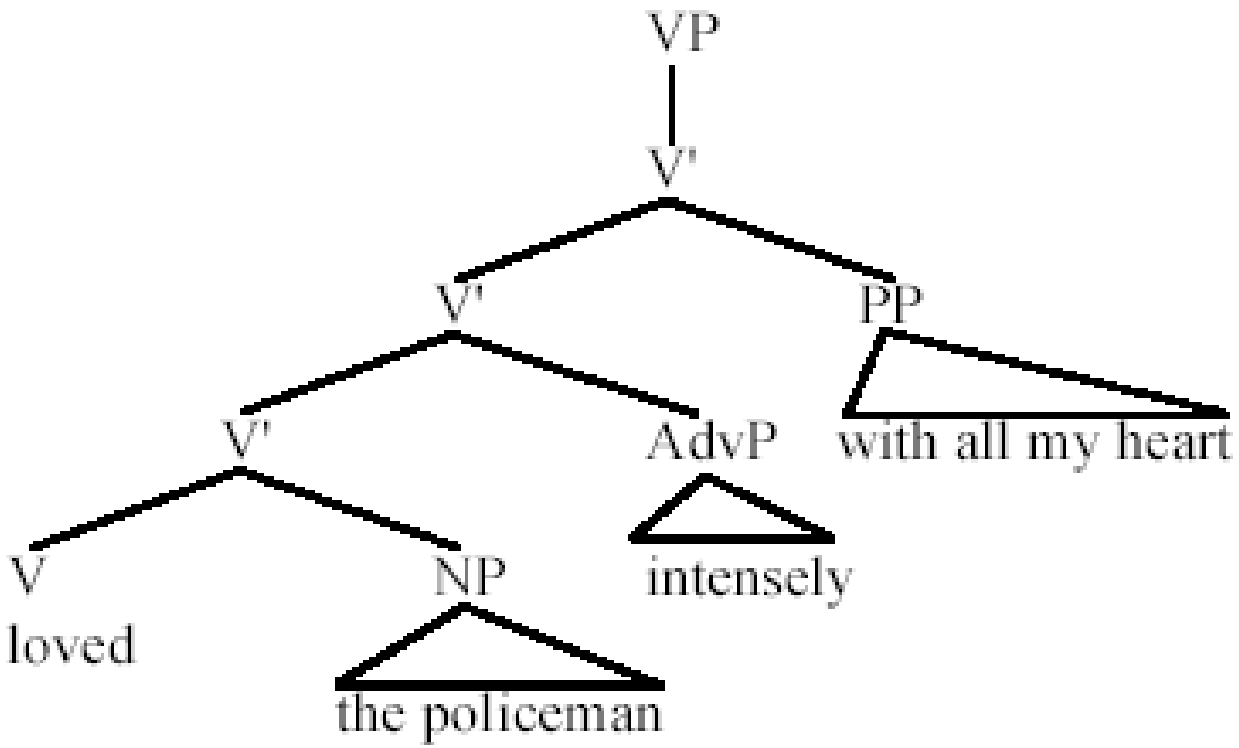
the boring	linguistics	book
adjunct	*complement*	*head*



VP

I loved [the policeman] [intensely] [with all my heart].

V	direct object	adverbial	PP phrase
	complement	*adjunct*	*adjunct*



What heads the sentence

- Head of S
  - A sentence is about a situation or state of affairs that occurs at some point in time
  - Auxiliary verbs specify a time frame for the sentence, whether the situation described by the sentence will take place, already took place, or is taking place now.

  → The Aux is a natural category to head S
- INFL and IP is also used instead of Aux and S
- Aux specifies:
  - Modal: may, can, will, shall, might, …
  - Tense: pres, past
  - Agreement: plural, 3rd person singular …
  - Etc.: have (in perfect), be

The Infinity of Language (Summary)

- The repetition of categories within categories accounts for infinitude.
  - All speakers of English have this ability → competence
  - As the structures grow longer they become increasingly more difficult to produce and understand due to *short-term memory limitations*, *muscular fatigue*, *breathlessness*, etc. → performance

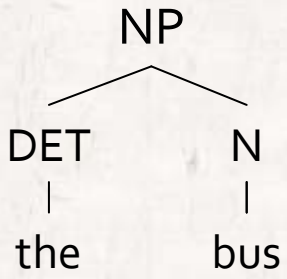
Phrase Structure Rules

- a speaker's knowledge of the permissible and impermissible structures existing as a finite set of rules that "generate" or provide a tree for any sentence in the language

- specify the structures of a language precisely and concisely

PS Rules

- Form: XP → W X
- Interpretation
  - XP is composed of W and X
  - W precedes X
- Examples
  - NP → Det N
  - NP → (Det) N (PP)
  - VP → V (NP) (PP)



Structural Ambiguity

- *The boy saw the man with the telescope*
- Two meanings
  - The boy used the telescope
  - The man had the telescope

Sentence Relatedness

Transformations & Their Rules

Ways sentences are related

The same structure, different meaning ← contain different words

- The boat sailed up the river
- A girl laughed at the monkey

Different meanings, same words, same order ← structural ambiguity

Different structure, little difference in meaning

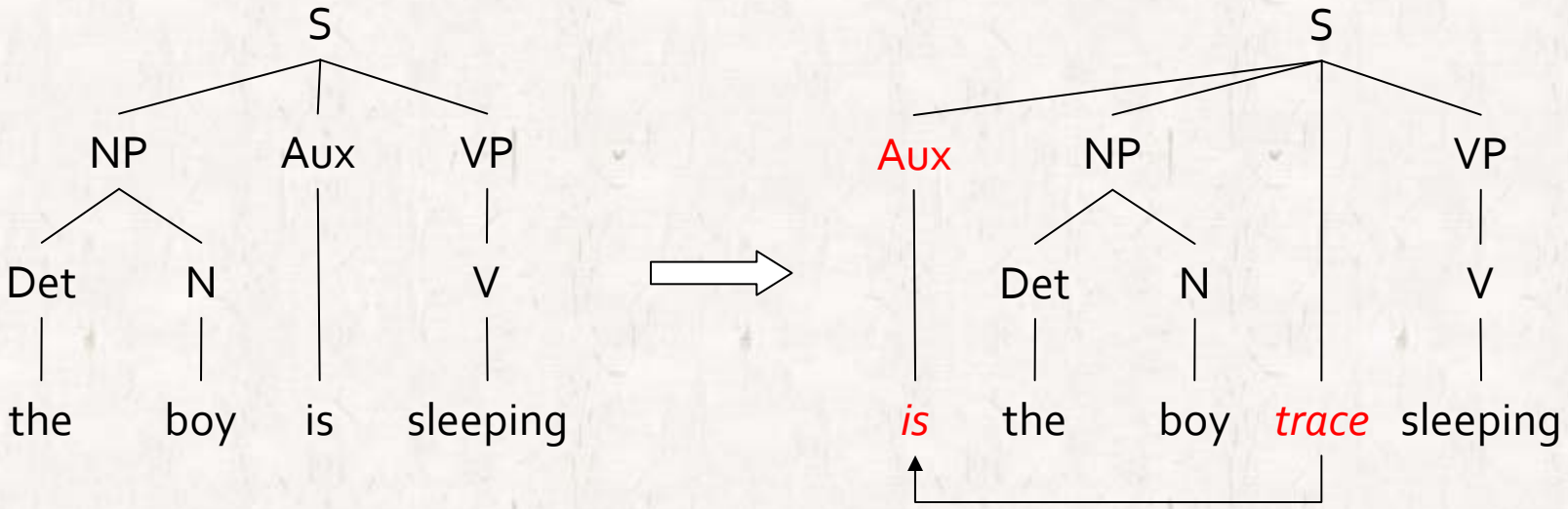
- The father wept silently - The father silently wept
- Mary hired bill – Bill was hired by Mary

Structural differences, corresponding systematically to meaning differences

- The boy is sleeping – Is the boy sleeping?
- The boy can sleep – Can the boy sleep?
- The boy will sleep – Will the boy sleep?

Transformation: Move Aux

- DS: *The boy is sleeping*
- SS: *Is the boy sleeping?*
- Steps
  - The PS rules generate a basic structure
  - Aux movement applies to produce the derived structure



Other transformations

- Passivization
  - The cat chased the mouse
    → The mouse was chased by the cat
- *there* insertion
  - *e* was a man on the roof
    - → There was a man on the roof
    - → A man was on the roof
- PP pre-posing
  - The astronomer saw the quasar with the telescope
    → With the telescope, the astronomer saw the quasar

Syntactic dependencies

- The presence of a particular word or morpheme can depend on the presence of some other word or morpheme
  - Selection: transitive verb requires direct object
  - Agreement: features in Aux (and on the verb) must match the features of the subject
- Another dependency in WH-questions …

Syntactic dependencies

- Problem
  - (a) What will Max chase ____?
  - (b) *Max will chase ____.
  - → In both (a) and (b), no direct object of verb "chase" (i.e. gap), but (a) is grammatical.
- Solution
  - "what" has moved from the gap position to the beginning of the sentence → the transformation rule 'Move *wh*'
  - That is,
    - Deep Structure: Max will chase what
    - Move Aux: $will_1$ Max t_1 chase what
    - Move *wh*: $what_2$ $will_1$ t_1 Max chase t_2

UG Principles & Parameters

- Principles
  - Basic design for human language
  - Language universal
  - Examples: PS rules, head-complement relationship, S headed by Aux (INFL)
- Parameters
  - Variations of that make languages different from each other
  - Language specific
  - Examples: the order of heads & complements, variations on movement rules
  - A child acquiring a language must "fix" the parameters of UG for any particular language

Homework

- Exercises 11-26 after the syntactic chapter.