Foundations of Language Science and Technology

WS 2014/2015

Syntax II

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Slides are based on:
An Introduction to Language,
Ninth Edition
Victoria Fromkin, V., Robert Rodman, R. and Hyams, N. (2011)
An Introduction to Language.
And more ☺

Categories

- Pretend the italicized nonsense words in the following sentences are real words of English.
- Identify the form class of each one, and state the morphosyntactic properties of each that lead you to assign it to a particular category.

(Van Valin, Robert D. *An introduction to syntax*. Cambridge University Press, 2001.)

Categories

(1)
a. The dog *wugged* the ball.
b. The dog is *wugging* the ball.
c. The dog likes to *wug* the ball.
d. The dog gently *wugged* the ball.
e. *The *wug* kicked the ball.
f. *The dog chased the *wug* cat.

(2)
a. The tall *blick* sat by the river.
b. The *blicks* played in the park.
c. Mary sent a present to her favorite *blick*.
d. Sam is not a *blick*.
e. *Max *blicked* the cat.
f. *The *blick* animal ran away.

(3)
a. A *nork* person walked by the car.
b. Mary is very *nork*.
c. *Sam *norks*.
d. *The *nork* called me yesterday.

(4)
a. *Li* cat slept by the fire.
b. I bought *li* three interesting books.
c. Mary didn't like *li* one.
d. I don't care for *li*.
e. *Two *li* dogs barked at the cat.
f. *Sam *lis* every day.

(5)
a. Max walked *blishly* down the corridor.
b. Max walked down the corridor *blishly*.
c. *Blishly*, Max walked down the corridor.
d. Sam did so extremely *blishly*.
e. *Pat is *blishly*.
f. *The *blishly* woman looked unhappy.

(6)
a. Larry placed the book *za* the table.
b. *Za* the table Sam found his glasses.
c. **Za* green book fell on the floor.
d. *I don't like *za*.
e. *Sam *zas* every day.
f. *Sam found his gloves *za*.

(7)
a. Anna bought *nace* rare books.
b. I liked *nace* of them.
c. *Nace* left the party early.
d. I thought she bought too *nace*.
e. *Anna bought rare *nace* books.
f. *Sam *naces* every morning.
g. *The tall red *nace* fell off the shelf.

(Van Valin, Robert D. *An introduction to syntax*. Cambridge University Press, 2001.)

Syntactic Categories

A child found a puppy.
A police officer found a puppy.
Your neighbor found a puppy.
This yellow cat found a puppy.

- It is possible to substitute *the child* by 'similar' expressions
- Noun phrase (NP)
  - Subject, Object (function)
  - Often contains a determiner
  - Proper names, pronouns, nouns without a determiner, a clause, sentence

Syntactic Categories

John found a puppy.
He found a puppy.
Boys love puppies.
The puppy loved him.
The puppy loved John.

- ❑ Complex NPs

The girl that Professor Snape loved married the man of her dreams.

Syntactic Categories

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- ❑ Complex NPs

The girl that Professor Snape loved married the man of her dreams.

- NP subject (The girl that Professor Snape loved)
- NP object (the man of her dreams)

Syntactic Categories

- ❑ Prepositional Phrase (P + NP)
- ❑ Verb Phrase
  - ❑ Verb '*maybe' plus*
    - Noun Phrase
    - Prepositional Phrase

"The child _____ ."
(a) saw a clown
(b) a bird
(c) slept
(d) smart
(e) ate the cake
(f) found the cake in the cupboard
(g) realized that the earth was round
(p. 128)

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- ❑ (a), (c), (e), (f), and (g) ➔ grammatical sentences
- ❑ (b) or (d) ➔ ungrammatical sentence
- ❑ ➔ (a), (c), (e), (f), and (g) are verb phrases (VPs)

Syntactic Categories

- Lexical and functional categories
  - Lexical categories

Noun (N): *puppy, boy, soup, happiness, fork, kiss, pillow, cake, cupboard*
Verb (V): *find, run, sleep, throw, realize, see, try, want, believe*
Preposition (P): *up, down, across, into, from, by, with*
Adjective (Adj): *red, big, candid, hopeless, fair, idiotic, lucky*
Adverb (Adv): *again, carefully, luckily, never, very, fairly*

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

A. Apply tests to show that the underlined phrases are constituents.

a. *A lady in a blue dress sang the national anthem in the stadium some time after noon.*

b. *Someone saw a suspicious-looking man with a briefcase walking around in the foyer on Monday half an hour before the building blew up.*

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

B. Identify the categories coordinated by the italicised conjunctions in the sentences below.
a. A cleaner *and* a professor of physics recently got married.
b. She will sing *and* play a Beatles tune.
c. He went to the restaurant for a pie *and* chips *but* only had a glass of wine there.
d. There was an interesting talk on the last day of the conference, *but* everyone fell asleep.
C. Find the heads of the phrases below. Is the phrase a NP, AP, VP, AdvP or PP?
a. that big and ugly building b. in the house over there
c. extremely proud of his children d. smokes very weird cigarettes
e. sometimes sings out of tune f. outside the house over there
g. seldom knew all the answers h. completely unbeknownst to us
D. Identify the NP and VP which combine to form the following sentences.
a. The lady over there and her friend know George.
b. Fred obviously believes the story about the Martian invasion.
c. A big problem with the theory still gives the researchers cause for concern.
d. He usually read or watched television.

Syntactic Categories

- Lexical and functional categories
  - Functional categories

Determiner (Det): *a, the* also **demonstratives** *this, that, these, those* also **quantifiers** *each, every*

Auxiliary (Aux): *have, had, be, was, were* and **modals** *may, might, can, could, must, shall, ..*

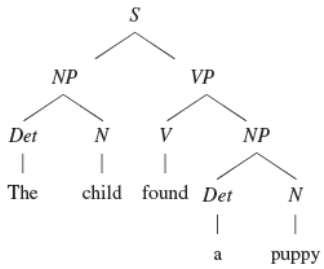
- Why do we call them functional categories?

Syntactic Categories

- Why do we call them functional categories?
  - Compare
    - A man versus the man
    - This man versus that man
    - Peter is dancing. versus Peter has danced.
    - Peter may dance. versus Peter must dance.

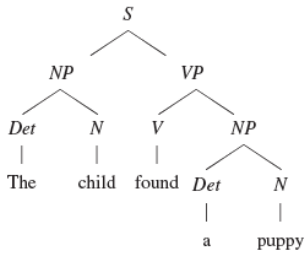
Phrase Structure Trees and Rules

- Linear string
- Hierarchical structure (phrases)



Phrase Structure Trees and Rules

- Phrase structure trees ➔ speaker's syntactic knowledge
  - Linear order
  - Identification of syntactic categories
  - Hierarchical structure (syntactic categories)
  - Rules to describe a structure ('little' grammar)
    - S ➔ NP VP
    - NP ➔ Det N
    - VP ➔ V NP



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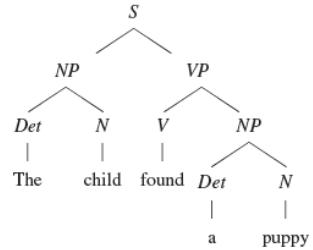
- Tree structure -> speaker's intuitions about grouping words
  - Higher node **dominates** all categories beneath it
  - **Immediately dominate** -> categories one level below
  - Categories that are immediately dominated by the same nodes are **sisters**



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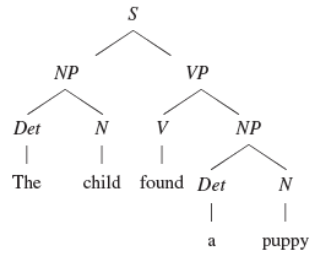
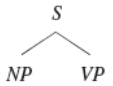


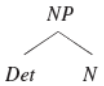
Phrase Structure Trees and Rules

- Building trees (subtrees)

1. S ➔ NP VP



2. NP ➔ Det N



3. VP ➔ V NP

Phrase Structure Trees and Rules

- But our 'little' Grammar does not account for sentences like:

The man laughed.
The woman danced.
The horse vomit.

Phrase Structure Trees and Rules

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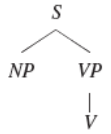
4. VP ➔ V

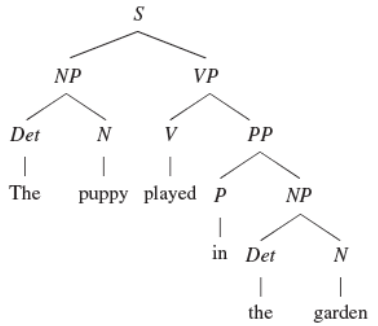


Phrase Structure Trees and Rules

- But our 'little' Grammar does not account for sentences like:

The puppy played in the garden.
The boat sailed up the river.
A girl laughed at the monkey.
The sheepdog rolled in the mud.

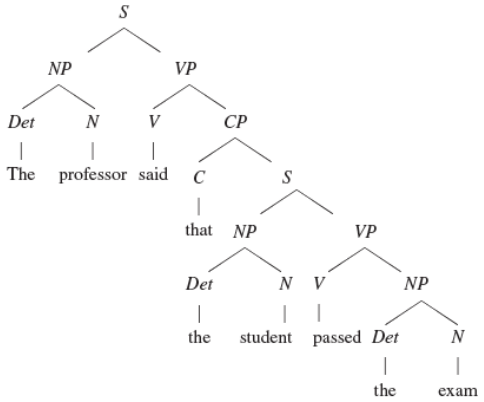
Phrase Structure Trees and Rules



5. VP ➔ V PP
6. PP ➔ P NP

Phrase Structure Trees and Rules

- Embedded sentences



7. VP ➔ V CP (C = complementizer)
8. CP ➔ C S

Phrase Structure Trees and Rules

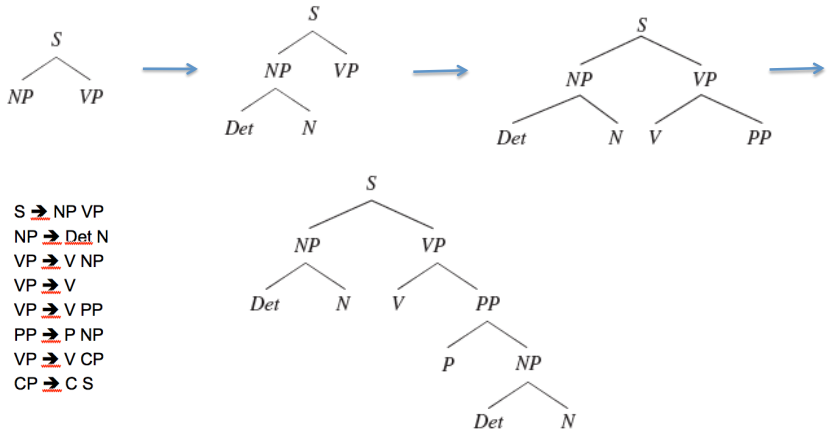
I don't know whether I should talk about this.
The teacher asked if the students understood the syntax lesson.

- PS rules of our 'little' grammar

1. S ➔ NP VP
2. NP ➔ Det N
3. VP ➔ V NP
4. VP ➔ V
5. VP ➔ V PP
6. PP ➔ P NP
7. VP ➔ V CP
8. CP ➔ C S

Phrase Structure Trees and Rules

- How to build trees (conventions)



1. S → NP VP
2. NP → Det N
3. VP → V NP
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5. VP → V PP
6. PP → P NP
7. VP → V CP
8. CP → C S

Recursive rules – the infinity of language

- It is not possible to define each legal structure
- Recursive rule
  - Multiple prepositional phrases

[The girl walked [down the street] [over the hill] [through the woods] . . .].

1. S → NP VP
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Our problem: we can not account for the sentence above

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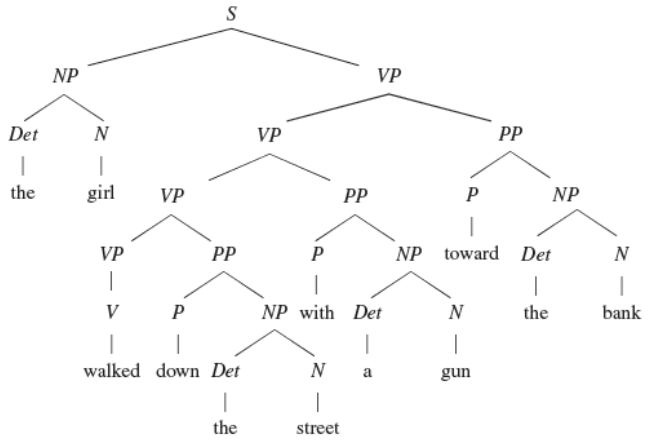
→Revising Rule 5

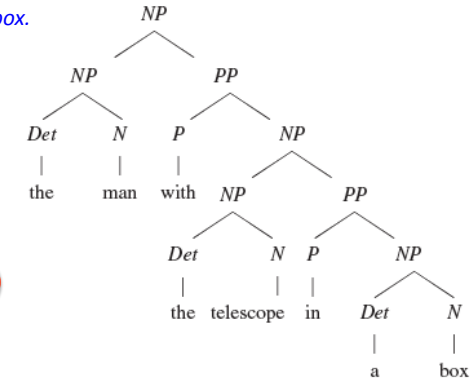
5. VP → VP PP

Recursive rules – the infinity of language



Recursive rules – the infinity of language

Complex NPs
the man with the telescope in a box.



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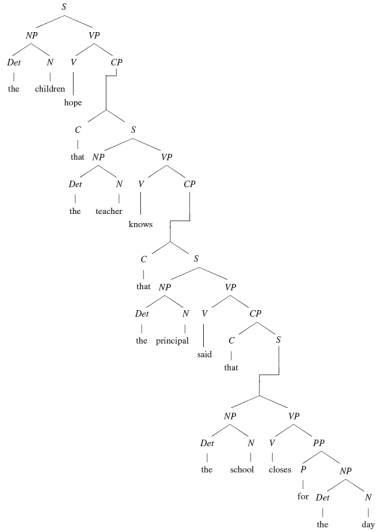
5. VP ➔ V PP
6. PP ➔ P NP
7. VP ➔ V CP
8. CP ➔ C S

9. NP ➔ NP PP

Recursive rules – the infinity of language

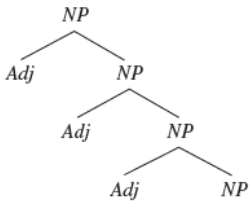
Now we can account for more 'complex' structures:
The children hope that the teacher knows that the principal said that the school closes for the day.



Recursive rules – the infinity of language

The kindhearted, intelligent, handsome boy had many girlfriends.

❑NP ➔ Adj NP



Recursive rules – the infinity of language

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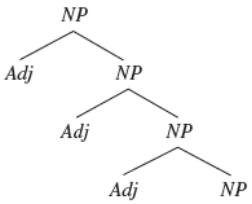
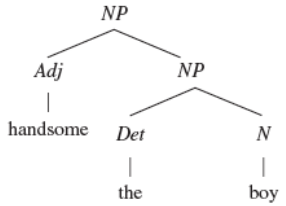


BUT there is something wrong



Recursive rules – the infinity of language

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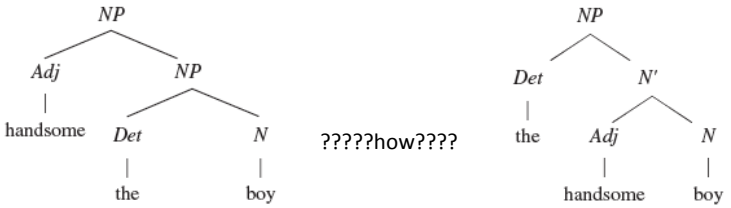
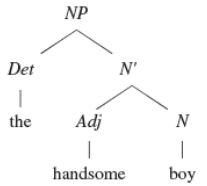


?????how????

Recursive rules – the infinity of language

- Sisterhood relations ➔ adjective *handsome* is sister to the noun *boy*
- *Handsome* modifies *boy modifies*
- DET is sister to the N' *handsome boy*
- ➔ revision of the NP rule ➔ new structure
- Not all NPs have adjectives ➔ second N' rule in which N' dominates only N

NP → Det N' (revised version of NP → Det N)
N' → Adj N'
N' → N

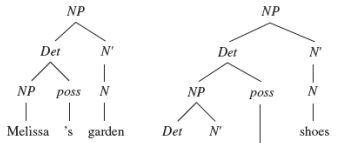


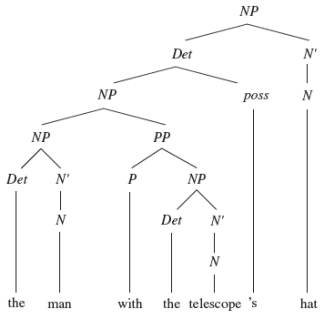
- NPs can consist of pronouns, proper names

NP → N'

Recursive rules – the infinity of language

- Possessive noun (Det ➔ NP poss)
  - This rule forms a recursive set with the NP ➔ Det N' rule





Heads an Complements

- Relationship among elements in a sentence
  - Structural definition of e.g., *subject and direct object*
- Relationship between **head** of a phrase and its sisters
  - N in NP
  - V in VP
  - …
- Sister categories are **complements**
  - VP *find a puppy refers to an event of finding*
  - NP object in the VP that completes its meaning ➔ complement
  - I thought **that the child found the puppy** ➔ complement (CP (that..) is a complement)

Heads an Complements

an *argument* over jelly beans (PP complement to noun)
his *belief* that justice will prevail (CP complement to noun)
happy to be here (infinitive complement to adjective)
about the war in Iraq (NP complement to preposition)
wrote a long letter to his only sister (NP—PP complement to verb)
tell John that his mother is coming to dinner (NP CP complements to verb)

- The order of a head and its complements can differ in different languages (a parameter ➔ Universal Grammar)

Table 1: head-parameter

English	Japanese
[VP read the book]	[VP hon-o yonda]
	book-ACC read
[NP picture of John]	[NP John-no syasin]
	John-of picture
[PP with John]	[PP John-to]
	John-with

(from o'Grady (1997))

Selection

- Verb ➔ complement or not ?
  - Properties of the verb (subcategorization C-selection)
- intransitive verbs, transitive verbs, ditransitive verbs, verbs with sentence complements …

Peter found the book.
*Peter found.
*Peter found in the kitchen.
Heiner slept.
*Heiner slept the book.
Peter gave the book to Mary.
Klaus put the book in his pocket.
Klaus put the book.
Klaus put in his pocket.
Peter think,…

Selection

- Noun and complements
  - the belief in freedom of speech
  - the belief that freedom of speech is a basic right
  - their sympathy for the victims
  - *their sympathy that the victims are so poor
- Adjectives and complements
  - Tired of stale sandwiches
  - proud of her children
- Verb ➔ lexical entry certain ➔ intrinsic semantic properties

Selection

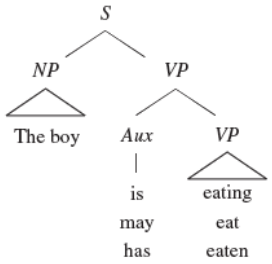
- Verb ➔ lexical entry certain ➔ intrinsic semantic properties (semantic selection (S-selection))
- Semantic anomaly

The rock murdered the man.
The beer dtrak the student.
The tree liked the boy.

- Well-formedness
  - Phrase conforms ➔structural constrain of the language (PS-rules)
  - Selection requirements of the head (S-selection & C-selection)

Heads, heads, heads but the sentence??

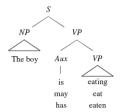
Peter **will** kick the ball.
Peter **has** kicked the ball.
Peter **is** kicking the ball.
Peter **may** kick the ball.



- What does the auxiliary do?

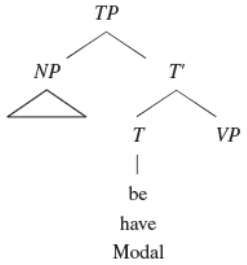
Heads, heads, heads but the sentence??

- What does the auxiliary do?



- VP is the complement of ***Aux***

The boy **is** danc**ing**.
The girls **has** eat**en**.
The child **must sleep**.
The boy **may eat**.



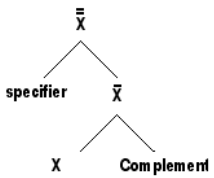
X-bar (Principle of Universal Grammar)

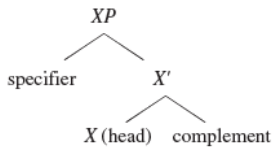
- Order of heads and complements
  - Head final
  - Head initial
- Head-direction parameter
- X-bar schema
  - XP -> Spec X'
  - X' -> (YP) X^0 (YP)

Table 1: head-parameter

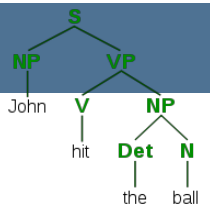
English	Japanese
[$_{VP}$ read the book]	[$_{VP}$ hon-o yonda]
	book-ACC read
[$_{NP}$ picture of John]	[$_{NP}$ John-no syasin]
	John-of picture
[$_{PP}$ with John]	[$_{PP}$ John-to]
	John-with

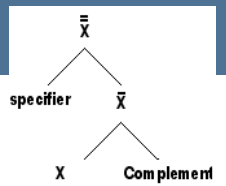
(from o'Grady (1997))





X-Bar

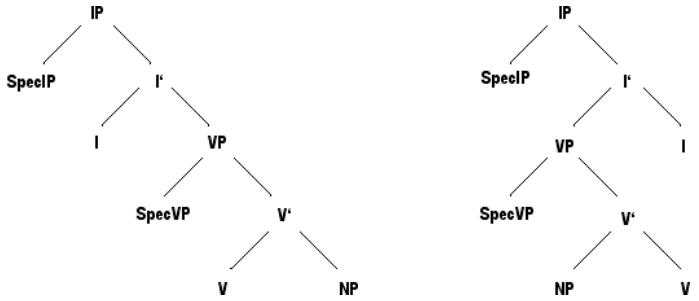




- A theory of the phrase structure
  - Principles
    - A phrase always contains a head of the same type
      - i.e. NPs Ns, VP Vs etc.
    - XP -> specifier X'
      - XP consists of a head that is a single bar, a specifier position, and a possible adjunct
    - X' -> X complement
      - A single-bar category contains a head with no bars and a possible complement
    - X' -> X' adjunct
      - A single-bar category can also contain a further single-bar and an adjunct ("a nice blue ball")
  - Lexical categories: N (Noun), V (Verb), A (Adjective), P (Preposition)

Phrase structure (reduced)

- English German:



Structural Ambiguities

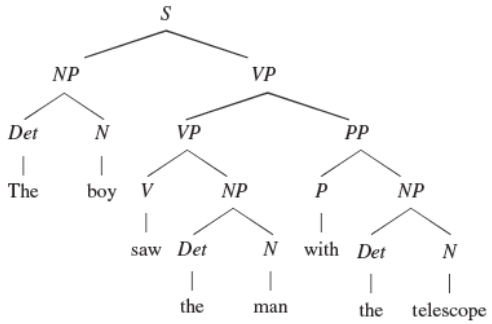
The woman saw the man with the telescope.

- Two interpretations are possible
  - Rules of syntax ➔ different structures
- Draw the trees-which PS rules are important?

Structural Ambiguities

The woman saw the man with the telescope.

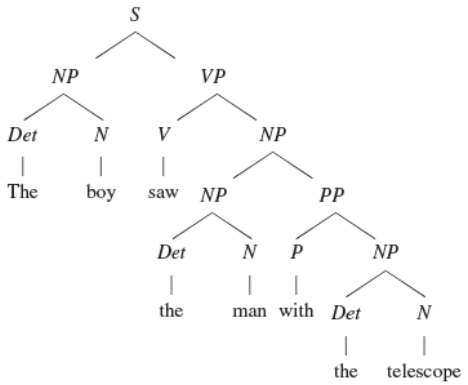
- VP ➔ VP PP



Structural Ambiguities

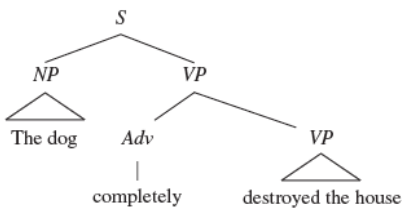
The woman saw the man with the telescope.

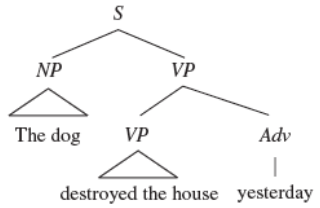
- NP➔ NP PP

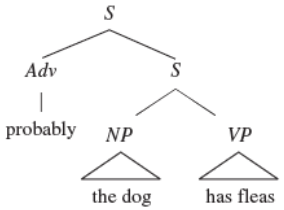


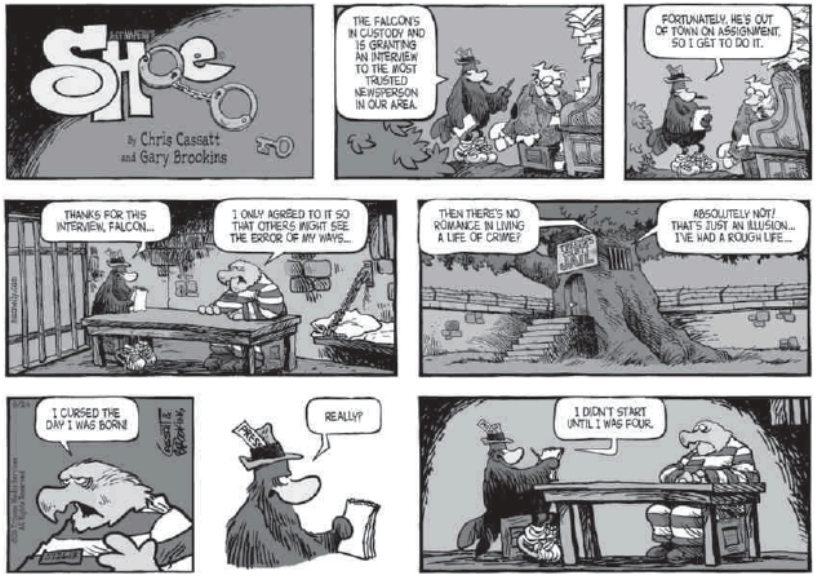
More phrase structure rules

- E.g., adverbs



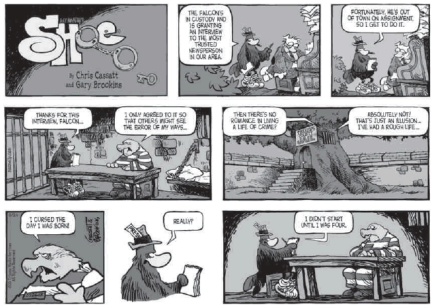


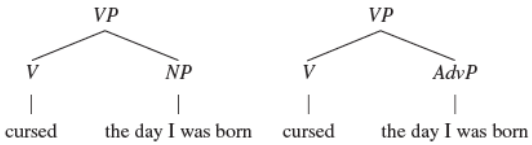




"Shoe" © MacNelly. King Features Syndicate

More structure





Sentence Relatedness

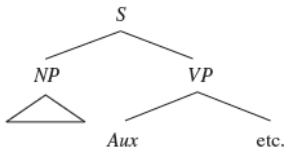
- Aspect of syntactic competence
  - Certain sentences are related
- The boy is sleeping. *versus* Is the boy sleeping?
  - Declarative sentence ➔ asserts a situation
  - Yes-no question ➔ asks for confirmation
- Meaning difference ➔ word order
  - structural difference that corresponds *in a systematic way* to a meaning difference
  - How does grammar account for this?

- "Phrase structure rules account for much of our syntactic knowledge, but they do not account for the fact that certain sentence types in the language relate systematically to other sentence types." (p.155)
- A related sentence is generated from a common underlying structure

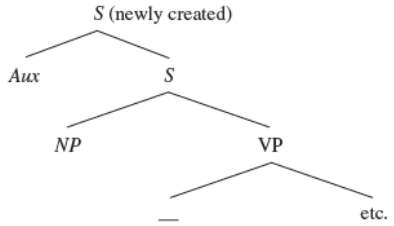
The teacher is eating. ➔Is the teacher eating?
The teacher has slept. ➔Has the teacher slept?
The teacher can snore. ➔Can the teacher snore?

- Move Aux: Move the Aux -dominated by the root S- and adjoin it to (the root) S

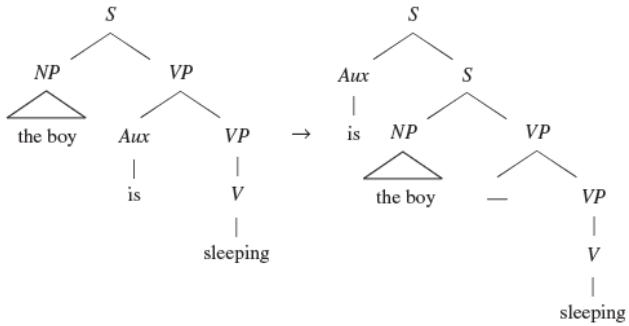
That is, Move Aux applies to structures like:



to give structures like:



- Phrase structure rules ➔ basic structure
- Movement ➔ derived structure



More examples

- Active-passive

  The man eat the cake. ➔ The cake was eaten by the man.

- PP preposing

  The woman killed her husband with a gun. ➔ With a gun, the woman killed her husband.

Structural dependency of rules

I know that you know. vs. I know you know.

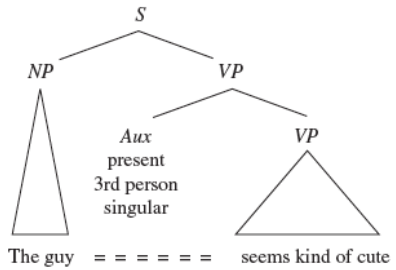
That you know bothers me. vs. *You know bothers me.

This guy seems kind of cute. vs. These guys seem kind of cute.

The **guys** (**guy**) we met at the party next door that lasted until 3 a.m. and was finally broken up by the cops who were called by the neighbors **seem** (**seems**) kind of cute.

Structural dependency of rules

The **guys** (**guy**) we met at the party next door that lasted until 3 a.m. and was finally broken up by the cops who were called by the neighbors **seem** (**seems**) kind of cute.

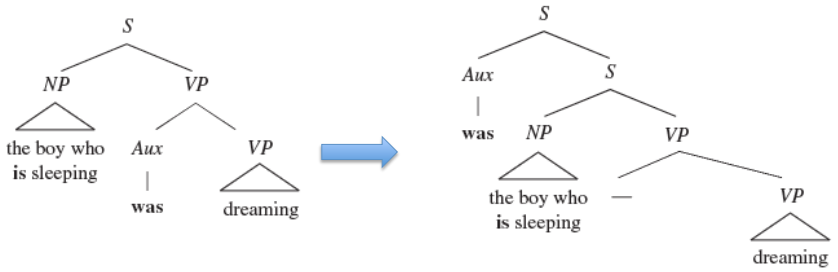


Structural dependency of rules

- The boy who is sleeping was dreaming.
- Was the boy who is sleeping dreaming?
- *Is the boy who sleeping was dreaming?

- The boy who can sleep will dream.
- Will the boy who can sleep dream?
- *Can the boy who sleep will dream?

Structural dependency of rules



Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

A. Apply tests to show that the underlined phrases are constituents.

a. *A lady in a blue dress sang the national anthem in the stadium some time after noon.*

b. *Someone saw a suspicious-looking man with a briefcase walking around in the foyer on Monday half an hour before the building blew up.*

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

B. Identify the categories coordinated by the italicised conjunctions in the sentences below.
a. A cleaner *and* a professor of physics recently got married.
b. She will sing *and* play a Beatles tune.
c. He went to the restaurant for a pie *and* chips *but* only had a glass of wine there.
d. There was an interesting talk on the last day of the conference, *but* everyone fell asleep.

C. Find the heads of the phrases below. Is the phrase a NP, AP, VP, AdvP or PP?
a. that big and ugly building
b. in the house over there
c. extremely proud of his children
d. smokes very weird cigarettes
e. sometimes sings out of tune
f. outside the house over there
g. seldom knew all the answers
h. completely unbeknownst to us

D. Identify the NP and VP which combine to form the following sentences.
a. The lady over there and her friend know George.
b. Fred obviously believes the story about the Martian invasion.
c. A big problem with the theory still gives the researchers cause for concern.
d. He usually read or watched television.

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

E. Are the phrases listed in brackets below each sentence below complements or modifiers, and what are they are complements or modifiers of? More than one answer may be right.
a. *People started loudly applauding the performance of the band in the next room.*
[the phrases headed by *loudly, in, of,* and *performance*]
b. *She gave Mary a book on French art from the last century at the party.*
[the phrases headed by *at, from, on, Mary, book*]
c. *The minister resigned because of the parliamentary decision on Friday*
[the phrases headed by *on, because of*]
d. *They unanimously rejected the application for funding for a second trip to America in August.*
[the phrases headed by *in, for* (both occurrences) , *unanimously*]

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

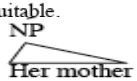
F. Draw trees for the NPs below. Use triangle notation (see footnote 6) for all PPs and APs.

a. a French painter of abstract landscapes
b. the man in the grey suit near the bar
c. a big, old car in the street
d. Mary's hatred of plastic spoons
e. my friend's wife's car
f. a friend of my wife's car
g. John and Mary's brother [draw two trees for g., one for each meaning]

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

G. Determine the complements and modifiers of the italicised verbs in the following sentences.

a. He *left* his keys in his pocket.
b. He *left* his wife in Berlin in 1973.
c. He *left* his wife in 1973 in Berlin.
d. James *passed* the sugar to Ann.
e. James *passed* Ann at the corner.
f. Fred *got* a parking ticket in front of the shop.
g. Fred *got* the key into the lock.
h. They *decided* that Gertrude was suitable.
i. Egbert *talked* about everyone's dissatisfaction with the politicians.

H. Draw trees for the VPs in the sentences below. Use triangle notation 

for all NPs, PPs, AdvPs and APs.

a. She often watched videos in the evenings.
b. He gave flowers to Mary yesterday.
c. She sent the letter yesterday.
d. She sent John a book yesterday.
e. She went to the pub every night.
f. She woke early the next morning.
g. They called her a genius.
h. They called a doctor the next day.

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

I. In the following sentences, find each instance of the category given in brackets after the sentence. Be careful when deciding where each phrase begins and ends.

a. He drove his brother's wife's car from the top of the hill to the beach. (NP)
b. Mary's brother and John are doing a course on the history of the Roman empire. (NP)
c. At the next meeting, the president of the committee called in an expert on environmental pollution and global warming from America. (NP)
d. The person over there and John's brother are professional suntan lotion testers. (NP)
e. Francine's idea of a luxurious Sunday afternoon is to have a very hot bath while consuming immoderately large amounts of affordably cheap French champagne or reading some articles relevant to her work for the next week. (AP)
f. It's not so very surprising that he's quitting his job, considering that that large an amount of boring and difficult work gets assigned to him on an almost daily basis. (AP)
g. Rover walked out of the house, down the driveway and onto the street. (PP)
h. The ball hit me right on the nose. (PP)
i. The man at the door's car is on the road, just near the entrance to our house. (PP)
j. Put the chair between the cupboard and the lamp or near the window. (PP)

Exercises (Fundamentals of English Syntax (Version 3) Andrew McIntyre)

J. The sentences below show **syntactic ambiguity**: they could be analysed as having two different structures which each has a different meaning. Use your knowledge of syntax to resolve the ambiguity. Answers to the first two questions are given as an example. (It is only necessary to indicate the structure and categories which are relevant to the resolution of the ambiguity.)

a. *Old men and women were sitting in the park.*
Answer: Reading (1): *old* modifies *men and women*: [$_{N'}$ old [$_{N'}$ men and women]]
Reading (2): *old* modifies *men* but not *women*: [$_{N'}$ [$_{N'}$old men] and [$_{N'}$women]]

b. John gave her the flowers in the kitchen.
Answer: The PP might modify either *give* or *flowers*. The structures:
gave [$_{NP}$ her] [$_{NP}$ the flowers in the kitchen]
[$_{VP}$ [$_{VP}$ gave her the flowers] in the kitchen]

c. *He bought her books.*
d. *She has read many books on political affairs in recent years.*
e. *She watched the man with the telescope.*
f. *Do you have more interesting books?*
g. *The boss talked about the workers in the factory.*
h. *There was nothing I wanted to watch on television - only bad movies and documentaries.*
i. *She said that she liked him at the party.*